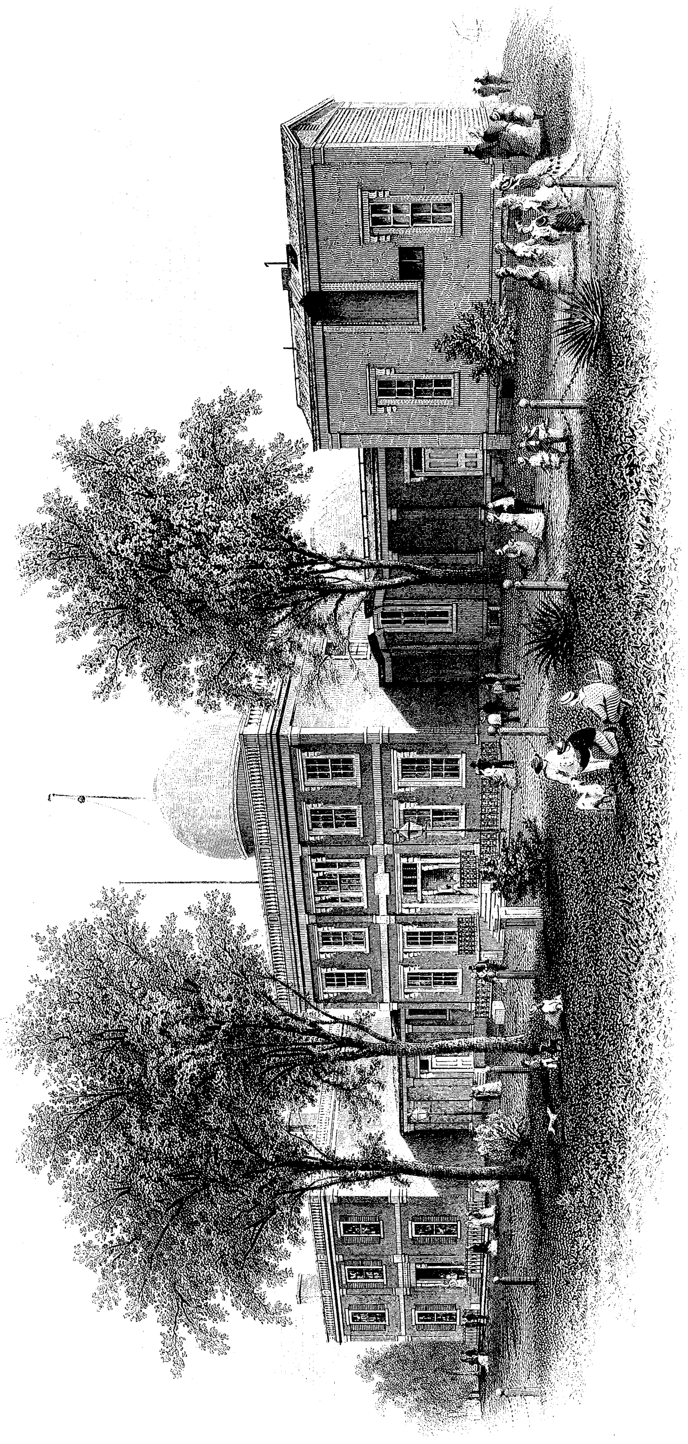

ASTRONOMICAL

AND

METEOROLOGICAL OBSERVATIONS

MADE DURING

THE YEAR 1875,

AT THE

UNITED STATES NAVAL OBSERVATORY.

REAR-ADMIRAL C. H. DAVIS, U. S. N.,
SUPERINTENDENT.

PUBLISHED BY AUTHORITY OF THE
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ERRATA.

WASHINGTON OBSERVATIONS FOR 1873.

Page IV, in the last note on the page, after "sub-polar stars," insert "of the American Ephemeris."
Page 236, No. 34, N. P. D. should be 15° 42′ 24″.7.
Page 236, No. 52, N. P. D. should be 20° 23′ 25″.6.
Page 240, No. 189, N. P. D. should be 21° 9′ 21″.1.
Page 243, No. 333, N. P. D. should be 13° 44′ 22″.6.
Page 244, No. 371, N. P. D. should be 17° 42′ 51″.2.

WASHINGTON OBSERVATIONS FOR 1874.

Page 56, No. 21, for Anonymous read B. A. C. 4742.
Page 66, No. 44, for Anonymous read B. A. C. 4742.
Page 68, No. 36, for Anonymous read B. A. C. 4742.
Page 305, for γ^1 Ceti read γ^2 Ceti.
Page 322, correction to α Cephei (Ref.), Nov. 14, should be − 2″.7.
Page 353, last star, for Anonymous read B. A. C. 4742.
Page 353, last star, for Mar. 21 read May 21.
Page 373, No. 178, for Anonymous read B. A. C. 4742.

WASHINGTON OBSERVATIONS FOR 1875.

Page 24, No. 21, mean wire should be 18^{m} $6^{s}.06$.
Page 24, No. 21, apparent right ascension should be 7^{h} 17^{m} $50^{s}.60$.
Page 80, No. 32, for Anonymous read Mural Zones 174, 65.
Page 80, No. 33, for Anonymous read Mural Zones 174, 66.
Page 80, No. 37, for Anonymous read Mural Zones 171, 9.
Page 80, No. 48, for Anonymous read Mural Zones 174, 65.
Page 81, No. 1, for Anonymous read Mural Zones 174, 66.
Page 81, No. 6, for Anonymous read Mural Zones 171, 9.
Page 96, No. 48, for Anonymous read Mural Zones 171, 9.

REPORT OF THE SUPERINTENDENT OF THE OBSERVATORY TO THE CHIEF OF THE BUREAU OF NAVIGATION.

United States Naval Observatory,
Washington, October 25, 1875.

Sir: I have the honor to submit the following report of the Observatory for the current year:

ASTRONOMICAL WORK.

The 26-*inch Equatorial.*—This instrument continues to be employed in the observation of the satellites of the planets Neptune, Uranus, and Saturn. Some of the more difficult and interesting of the double stars are also observed; and drawings of Mars, Jupiter, and Saturn, and of several nebuæ, have been made by Professor E. S. Holden and Mr. Trouvelot, of Cambridge.

The following is the report made by Professor Holden of the drawings of nebulæ, &c.:

"Mr. L. Trouvelot, formerly engaged at the observatory of Harvard College, was invited by the Superintendent of the Naval Observatory to visit Washington for the purpose of making drawings of nebulæ, planets, &c., as they appear in the 26-inch equatorial.

"Mr. Trouvelot visited the Observatory during the last part of September, 1875, and while there made pastel-drawings of two nebulæ, viz, the nebula No. 4403 of Herschel's General Catalogue, and part of the nebula Orionis, General Catalogue No. 1179, as well as a pastel-drawing of the planet Saturn. These drawings represent the appearance of these objects during the period from September 21 to October 2, 1875. The method of making the drawing of Saturn was first to prepare, from the Nautical Almanac data, a pencil-drawing of the planet about four or five inches in extreme dimensions. This was taken to the telescope, and careful studies of the planet made on every clear night. These studies were afterwards embodied in a pastel-drawing on a much larger scale, so that the diameter of the ball of the planet was about 10 inches. This completed drawing was not compared with the heavens, as the limited time at Mr. Trouvelot's disposal did not permit a sufficiently long stay. It may, however, be regarded as compared, since another such pastel-drawing, made by Mr. Trouvelot in Cambridge, was so compared, and a copy made of this, in which the changes due to the 26-inch telescope were embodied.

"The drawing of the nebula, General Catalogue, 4403 (R. A. = $18^h\ 12^m$; N. P. D. = 106°), was made in the following way: A net-work of squares (of which the sides were about one minute of arc) ruled on glass was inserted in a negative eye-piece magnifying 130 diameters. This was placed in the telescope, and the latter was so pointed that the brightest star in the nebula should always be in the corner of one of the squares, and the clock-work motion of the telescope was so adjusted as to keep this star in its proper position. A piece of drawing-paper was ruled into squares, similar to those of the reticule, and on this were put down the brighter stars of the nebula, and some of its most prominent lines and boundaries. Then this eye-piece was removed, and a positive, magnifying about 400 diameters, was substituted, with which most of the smaller stars were put in by allineation, and the details of the nebula drawn.

"Occasionally an eye-piece magnifying 300 diameters was used. It is to be remarked that the error of a star-position by this method is quite large compared with the error of a similar position determined by transits or by a filar micrometer; but, on the other hand, the rapidity of the process is comparatively very great.

"Owing to a previous study of this nebula by means of his 6½-inch equatorial, and the consequent familiarity with the conformations of the star-groups, Mr. Trouvelot was enabled to put in most of the bright stars in one night; an amount of work which the use of the filar micrometer would require at least thirty times as long to perform.

"To test the accuracy of Mr. Trouvelot's star-positions, I examined his original drawing of the stars in this nebula, comparing his co-ordinates of eleven of the principal stars with those measured by Lassell in 1863, and given in Mem. R. A. S., vol. 36, p. 49. The scale of Mr. Trouvelot's drawing is 1 inch = 129″.3, nearly.

Number of Star.	Lassell.		Trouvelot.		Trouvelot—Lassell.	
	$\triangle \alpha$	$\triangle \delta$	$\triangle \alpha$	$\triangle \delta$	In α	In δ
	″	″	″	″	″	″
1	+ 114.2	− 68.3	+ 116.1	− 64.5	+ 1.9	+ 3.8
3	+ 162.9	+ 160.3	+ 163.4	+ 157.0	+ 0.5	− 3.3
4	− 492.6	+ 18.6	− 473.0	+ 8.6	+ 19.6	− 10.0
5	− 284.3	− 196.8	− 281.7	− 187.0	+ 2.6	+ 9.8
6	+ 120.7	− 158.2	+ 124.7	− 165.6	+ 4.0	− 7.4
7	+ 12.3	+ 38.8	+ 30.1	+ 43.0	+ 17.8	+ 4.2
8	+ 5.9	+ 137.8	+ 17.2	+ 137.6	+ 11.3	− 0.2
9	− 4.6	− 177.5	− 10.8	− 178.4	− 6.2	− 0.9
10	+ 189.8	+ 32.7	+ 187.0	+ 21.5	− 2.8	− 11.2
11	+ 113.3	+ 63.0	+ 118.2	+ 64.5	+ 4.9	+ 1.5
12	− 365.9	+ 12.8	− 352.6	+ 6.4	+ 13.3	− 6.4
Mean without regard to sign	. .	. .	. .	. .	7.7	5.3

"The foregoing table shows that the error of Trouvelot referred to Lassell is about 8″ in R. A. and 5″ in declination. I am inclined to suppose that the average error of a star-position determined by this method under favorable circumstances is less than 6″, for the reason that the clock-work motion of the telescope was not in good running order, and that consequently the standard star was not always in its correct position in R. A., while its declination was not affected, as the wires had previously been placed in the parallel. This is confirmed by the magnitude of the residuals; those in R. A. being much greater. This average error of 6″ would not amount to a change of $\frac{1}{20}$ of an inch in the position of a star in a drawing which could be put upon an ordinary quarto page.

"By laying down on Mr. Trouvelot's original drawing a circle of the size of Lassell's field of view, and identifying the latter's stars, I find that this drawing lacks the following stars laid down by Lassell, namely, Nos. 25, 26, 27, 29, 36, 37, 38, 48, 51, 54, 56, 59, 60, 62, 64, 65, 66, 68, 69, and 74; 20 in all; while there are 29 which are not laid down by Lassell in the same space.

"The explanation of this discrepancy is very simple. Each observer laid down peculiarly those stars which seemed to him to be required for the delineation of the nebula, and while it was attempted in a general way to put in all the brighter stars, yet if on a casual inspection of any space void of nebulous matter no stars were at once seen, the eye immediately turned to a space where the results of the work would be more valuable. The star-magnitudes are much more carefully assigned by Lassell; and it would be a work of value to re-examine this nebula carefully with the object of detecting any change in the relative brightness of its contained stars. This work could not be done during the few hours which circumstances allowed to be devoted to this nebula during this year.

"After the principal stars were inserted, and the prominent outlines put in, the drawing of the nebula was commenced by means of a lead-pencil and stump. This was continued until a satisfactory result was reached, the nebula being depicted in black on a white ground. A pastel-drawing of large size was then made from a tracing of the original stump-drawing. The appearance of the nebulous matter can be well represented in this way. This drawing was then taken to the telescope and carefully compared with the heavens, and any changes were at once made without moving out of the observing-chair. The principal advantage of pastel-drawing consists in this facility in making corrections. A few of the smaller stars were then put in by allineation. It is well to remark that the brighter portions of this nebula give evidence of its resolvability. All the brighter parts of the "horseshoe," and of the long branch extending from star No. 8 to star No. 71, seem, under intense looking, to be just ready to break into small stars. Many small points of light were put down both by myself and by Mr. Trouvelot, which are not included in the preceding enumeration; but it was soon found that such a task was endless, and of far less importance than the correct delineation of the nebulosity. For nearly all the details of this, Mr. Trouvelot is responsible, as time did not allow of that careful and independent comparison which it is desirable should always be made; but it may be said briefly that there are no conjectures laid down on the drawing. Everything is as it was seen. I confined my attention principally to the space limited by stars 1, 6, 9, 61, 63, 70, 20, 8, 3, 10, on account of the evidence from older drawings that this portion has moved relatively to the stars; and I can vouch for its general accuracy. It is sufficiently correct to found an argument for or against variability. For example, I am sure that the brightest mass of nebulosity *follows* star No. 1, as Mr. Trouvelot has drawn it; and I am sure that the general direction of the dark channels between stars 7 and 53 is correct in the drawing. Also, it is certain that the general effect of the whole nebula is kept in the pastel-drawing.

"The stars in the nebula of Orion were laid down by me from G. P. Bond's catalogue of them (Annals H. C. Observatory, vol. v) on a scale of 1 inch = 32 seconds of arc; and the central portion of the nebula was drawn by Mr. Trouvelot on this sheet, and afterward completed in pastel.

"No attention was paid to the stars in this case, as all of Bond's in the limits of ± 300″ from the trapezium had been carefully verified by myself in the years 1873 and 1874, and a few stars (four in all) added. One of these was independently discovered by Lassell and by Alvan Clark, jr., with the Chicago 18½-inch telescope.

"The drawing of the nebula Orionis may be considered a preliminary sketch of fair accuracy; and, during the coming opposition, it will be corrected. The drawing of Saturn has been verified in every point by myself, except as to the existence of notches in the inner edge of the outer ring. Mr. Trouvelot is certain of these. Distinct markings on a rosy belt were well seen, and are given in the drawing. The color of the belt is similar to that of the belt of Jupiter, but a little more rosy than I have seen Jupiter's belts during this opposition."

This instrument is in good order, and is in constant use. The dome is also in good condition, and works well. The sail-cloth shutters need to be renewed occasionally, but give as little trouble, perhaps, as anything that can be used. During the past summer the driving-clock has given considerable trouble, and it requires some improvements. It is doubtful if a clock of this construction can ever be made to move the telescope with very great steadiness; but by constant care and attention the present clock can be made to perform tolerably well A chronograph, made by Alvan Clark & Sons, has been added to the equipment of this instrument, and also a clock by Frodsham, which is not yet mounted

Operations with the Transit Circle.—This instrument has been in charge of Professor John R. Eastman. Assistants Edgar Frisby and A. N. Skinner were on duty throughout the year. Assistant Ormond Stone was on similar duty until his resignation on March 20, 1875. On August 4, 1875, Assistant Henry M. Paul reported for duty and was assigned to the Transit Circle.

This instrument has been employed in observations of the sun, moon, and planets, and of a large list of miscellaneous stars, whose places were desired, (1) for the reduction of observations made with the 9½-inch equatorial; (2) as zero-points for the formation of a catalogue from the zone-observations made here in the years 1846 to 1849; (3) for the use of Lieutenant G. M. Wheeler, Corps of Engineers, United States Army, in the reduction of the zenith-telescope work of his parties engaged in surveying and exploring the Western Territories; (4) for the use of Lieutenant-Commander F. M. Green, in his determinations of latitude in the West Indies.

In January last a series of observations was begun of all the stars of the British Association Catalogue between 120° 0′ and 131° 10′ North-Polar Distance, that have not been observed here three times in both right ascension and declination.

Owing to the pressure of other work, the observations of Nautical Almanac stars have been generally limited to those necessary for the determination of time and azimuth, and for reflection-observations.

In October, 1874, clock-signals were exchanged on five nights with Lieut. G. M. Wheeler's observatory at Ogden, Utah, to determine the longitude of that station. A report of this work will appear as an appendix to the volume for 1874.

The roof of the Transit Circle observing-room is still in a very unsatisfactory condition, and should be rebuilt on an entirely different plan.

A new apparatus for determining "personal equation," devised by Professor Eastman, has been procured for use with the Transit Circle. There has also been placed in that room a new apparatus for facilitating the observations of stars by reflection.

The 9.6-inch Equatorial.—During the summer and autumn of 1874 this instrument was employed by several persons to observe occultations in connection with the observers of the transit of Venus On October 15, 1874, Professor Eastman was directed to take charge of it. In November the instrument was employed by Professor Holden in observations of Juno. In the latter part of the month water was found between the lenses of the object-glass, and the usual means taken to remove it. A stain was left on the glass, and the lens will probably require repolishing.

This instrument has been principally employed by Professor Eastman in verifying the computed places of the asteroids, before attempting to observe them with the transit-circle.

Mural Circle.—During the past year Professor Yarnall has been engaged with the Mural Circle in making observations required to complete the star catalogue for a second edition, which he purposes to prepare before being retired on account of age. His success with his instrument has been gratifying. His continued health and strength have enabled him to do as much work as in previous years. His time in the office has been employed in reducing his work and preparing it for the press, and it is now nearly ready for publication. He has also read the proofs for the volume which is now in press, and which will shortly be published—the volume for 1873. He has the assistance of Professor Lockwood in revising his work, and in making such copies of it as are necessary.

Theoretical investigations.—Professor Newcomb remained in charge of the great equatorial until May last, when he was relieved at his own request, in order to give him more extended opportunities for pursuing the astronomical investigations he had in hand. The first of these was the discussion of the measures of the satellites of Uranus and Neptune made by him with the great equatorial. This work has been finished and printed. It is believed to have led to by far the most certain and satisfactory determination of the orbits of those satellites, and of the masses of the planets, which have yet been made.

Congress having failed to make the appropriation asked for last year, there is but little progress to report on the work on the theory of the moon's motion. This circumstance is much to be regretted, in view of the large and increasing errors of the lunar ephemeris, and of the fact that it is chiefly to these investigations that the astronomers of the world are looking for an explanation of the errors in question. An appropriation of $3,000 is therefore asked for, with a view to their continuation.

A preliminary investigation, having in view the correction of the lunar ephemeris during the last few years, in order that it may be used for the determination of the longitudes of the transit of Venus stations, is now in progress. Most of the preliminary computations have been made by Mr. D. P. Todd, under the direction of Professor Newcomb, at the expense of the appropriation for the transit of Venus.

Professor Newcomb deems it proper to make honorable mention of the disinterested services rendered by Mr. D. P. Todd, who, without pay, is rendering valuable assistance in the observations with the two equatorials.

Meteorology.—This department has continued, since my last report, in charge of Professor Eastman. The usual observations with the barometer, and the dry, wet, and solar thermometers have been made by the watchmen at 0^h, 3^h, 6^h, 9^h a. m., noon, and at 3^h, 6^h, and 9^h p. m., on each day.

A series of experiments, to ascertain the effect of wind and of variable hygrometric conditions, or the amount of rain obtained in rain-gauges of various sizes and at different altitudes, was made by Professor Eastman in 1874, and the results will appear in an appendix to the meteorological observations for 1874.

That portion of the annual volume for 1874 containing the meteorological observations is now in press, and a few extra copies will soon be issued for exchange with our meteorological correspondents.

Chronometers.—There are at present 90 chronometers under comparison, of which 83 are ready for issue, and 7 undergoing trial. Ten are awaiting an opportunity to be sent for repairs to Messrs. Negus, who have continued to do the cleaning and repairing of instruments for the Observatory. This firm has in hand, at present, 14 chronometers, having sent 11 here during the year in good order.

Sixty-six chronometers and 19 comparing watches have been received from all sources, and 29 chronometers have been issued for use.

Lieutenant-Commander C. H. Davis, jr., was detached from duty in this connection June 1, 1875; Lieutenant-Commander C. H. Pendleton, September 6; and Lieut. L G. Palmer, October 3. Lieut. Conway H. Arnold is at present the only officer on duty with the chronometers.

During the past two months, time has been transmitted at noon over the country through an additional wire from the Observatory to the Western Union Telegraph office. It is now transmitted by two wires, instead of one, rendering its reception more certain, and necessitating less trouble in repeating at the telegraph office.

The Library.—The number of volumes and of pamphlets received during the year has fully equaled that of past years. The increase in the total number on the shelves of the Observatory is effected almost entirely by the exchanges through the annual distribution of its own publications, the cost of which is thus largely returned to the government by the building up of a scientific treasury. A moderate appropriation of money, however, is recommended as necessary for the purchase of works of high character not issuing from scientific institutions, and, therefore, not available by exchange.

The distribution of the volume of observations made during the year 1872, as well as of its separate appendixes, and of the papers published by the commission on the transit of Venus of December 8–9, 1874, has been promptly and fully effected.

Gilliss's Zones.—It will be remembered that, in 1849, the United States sent the late Captain Gilliss to Chili in charge of an astronomical expedition, whose primary object was to make certain measurements on Venus and Mars, with a view to the better determination of the solar parallax. The expedition spent more than three years in Chili, and accumulated a vast amount of material, among which was the most extensive series of zone-observations which had ever been made in the southern heavens. Upon the return of the expedition to the United States, the work of preparing its observations for the press was at once commenced, and prior to the death of Captain Gilliss four volumes had been published. It was his intention to have issued two more volumes, one of which was to have contained his observations of standard stars and the other his zone-observations. After his death, it did not seem practicable to continue the work on the original plan, but, at the earnest solicitation of many eminent astronomers, an effort was made to publish the places of the stars in the form of catalogues. In accordance with this plan the catalogue of the standard stars, which formed a quarto pamphlet of 73 pages, was published by the Observatory in 1870. Some work was also done on the reduction of the zones; but the funds available for that purpose being soon exhausted, application was made to Congress for more money, and $1,500 was granted in the naval appropriation bill approved March 3, 1873. It was supposed this would suffice to finish the work; but the computations proved more tedious than was expected, and when the money was expended the work was once more laid aside. As the Argentine Government has recently established an observatory at Cordoba, in which zone-observations intended to supplement the work of Captain Gilliss are at present being made, it is now more than ever important that the work of that officer should be reduced and published. With that view, I entertain a hope that Congress may be induced to appropriate the sum of $1,500 at its next session, which will be sufficient to finish the work.

OBSERVATIONS OF THE TRANSIT OF VENUS.

The following is an abridged statement of these observations at the several stations:

Northern stations.

	No. of photographs.
Vladivostok, Siberia	13
Peking, China	90
Nagasaki, Japan	60
Total	163

Southern stations.

Kerguelen Island	26
Hobart Town, Tasmania	39
Campbell Town, Tasmania	55
Queenstown, New Zealand	59
Chatham Island	8
Total	187

Contact-observations were obtained at the American stations, as follows:

First external contact.—Northern stations: Vladivostok, Peking, Nagasaki. Southern stations: Kerguelen, Queenstown.

First internal contact.—This was observed at the three northern stations, but only at Queenstown in the south.

Second internal contact.—This was also observed at all three northern American stations, but at only a single southern one—Campbell Town.

Second external contact.—This was observed at only a single one of the eight American stations—Peking.

Professor Newcomb has expressed the following opinions concerning the value of these observations, and concerning the probable error of the final determination of the solar parallax resulting from their discussion:

"It is my opinion that the optical observations of contacts made by the observers of all nations will, by their combination, give a value of the solar parallax of which the probable error will lie between 0″.02 and 0″.03. I also think that the American photographs alone will give a result at least as accurate as this, and probably more so. A large remaining mass of material will be the heliometer measures made by the Germans and Russians, as well as Lord Lindsay; various optical measurements made near the moments of internal contacts, and photographs in which Venus was partly on the sun. The combination of all these may be expected to give a result of equal weight with either of those already mentioned. I think, therefore, that we may look forward with considerable certainty to seeing the probable error from the combination of all observations, less than 0″.02, and, perhaps, not much more than 0″.01. At the same time, it is not to be disguised that there is a possibility of unforeseen perturbing causes being brought to light by a comparison of all the observations which will upset all our *a priori* estimates of probable error."

During the past year the store-room for the safe-keeping of expeditionary instruments—particularly those employed in the observations of the transit of Venus—has been thoroughly repaired; provision has been made for the preservation of the records, notes, papers, and results (especially the photographic plates) of the transit parties. In this is included the means of making the micrometric measurements with the least possible risk to the plates themselves.

With regard to the old buildings of the Observatory, I regret to say that in many respects—embracing among others painting and the furniture of the offices—they are in a dilapidated condition.

Very respectfully, your obedient servant,

C. H. DAVIS,
Rear-Admiral, Superintendent.

Commodore Daniel Ammen, U. S. N.,
Chief of Bureau of Navigation, &c., Washington, D. C.

GENERAL INTRODUCTION.

The Observatory was originally built as a depot of charts and instruments for the Navy, and was fully described in a "Report on the Plan and Construction of the Depot of Charts and Instruments, with a description of the instruments", etc., made by Lieutenant James M. Gilliss, U. S N., to the Secretary of the Navy in February, 1845, and published as Senate Document No. 114, Twenty-eighth Congress, second session. A more general description, illustrated by plans and drawings, may be found in the volumes of Washington Observations for 1845 and 1865

Position of the Observatory.—The latitude deduced from observations with the Mural Circle in 1845 and 1846 was + 38° 53′ 39″.25;[1] and that value has been used in the reduction of all observations with the Mural Circle down to the present time. The observations made with the same instrument from 1861 to 1864 inclusive give a latitude + 38° 53′ 38″.8;[2] which has been used in the reduction of observations with the Transit Circle. The final north-polar distances of objects observed with the Transit Circle in any year depend upon all the observations of circumpolar stars made during that year

The longitude and the latitude of the Observatory are reckoned from the center of the old dome, which is built over the center of the main building.

The telegraphic determination of the longitude from Greenwich depends almost entirely upon the work of the United States Coast Survey. The following data are obtained from their official reports:

In August, 1872, the longitude was given as—

$$5^h\ 8^m\ 12^s.06 \pm 0^s.23,$$

and in August, 1873, it was announced by the assistant in charge of the office that the Coast Survey had made three independent determinations, with the following results:

	h.	m.	s.
In 1866 - - - - - - -	5	8	12.11
1870 - - - - - - -			12.10
1872 - - - - - - -			12.07

In interpolating tabular positions of the moon and planets, the longitude of the Observatory is assumed to be $5^h\ 8^m\ 12^s.0$.

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[1] Washington Observations, 1845, Appendix, p. 116.

[2] Washington Observations, 1864, Introduction, p. xliv.

Since the observatory was built, there have been several changes in the positions of its instruments; and, in order to facilitate comparisons of the work done with them at different times, their co-ordinates, measured from the center of the old dome, are given in the following table. The sign + before a co-ordinate indicates that the instrument is north or west of the center of the dome, and the sign — indicates that it is south or east of that point.

Instruments.	Diff. of Latitude.		Diff. of Longitude.	
	Feet.	″	Feet.	s.
Transit:				
January, 1845, to September 2, 1864 . .	0.0	0.00	+ 41.0	+ 0.035
Since October 1, 1864.	0.0	0.00	— 42.9	— 0.036
Mural Circle:				
January, 1845, to September 15, 1845 . .	0.0	0.00	+ 32.0	+ 0.027
Since October 1, 1845.	0.0	0.00	— 33.9	— 0.029
Meridian Circle:				
January, 1845, to August, 1864	0.0	0.00	— 42.9	— 0.036
Prime Vertical Transit:				
Since January, 1845	— 45.4	— 0.45	0.0	0.000
Transit Circle:				
January 1, 1866, to June 5, 1869	0.0	0.00	+ 38.4	+ 0.032
Since October 1, 1869	0.0	0.00	+ 77.8	+ 0.066
26-inch Equatorial (center of dome):				
Since November 15, 1873	—120.1	— 1.19	0.0	0.000

Arrangement of work.—The system adopted at the time of the revival of the astronomical activity of this establishment in 1861 is still continued. Under this system, the observations with each instrument are directed by the officer having it in charge, who is held responsible for the proper performance of the work, and prepares the descriptions, explanations, and discussions of the observations contained in the annual volumes.

During the year the details for duty were as follows:

The Transit Circle was under the direction of Professor J. R. Eastman, U. S. N., assisted by Assistants E. Frisby and A. N. Skinner. Assistant O. Stone was also attached to this instrument until his resignation on March 20, 1875. On August 4 Assistant Henry M. Paul reported for duty, and was assigned to the Transit Circle.

The Prime Vertical Transit was not used during the year.

The Mural Circle and the Transit Instrument were under the direction of Professor M. Yarnall, U. S. N., who was assisted in computing by Professor H. H. Lockwood, U. S. N.

The 9.6-inch Equatorial was under the direction of Professor J. R. Eastman, U. S. N.

The 26-inch Equatorial was under the direction of Professor S. Newcomb, U. S. N., until May, 1875, when Professor A. Hall, U. S. N., was placed in charge of the instrument. Professor E. S. Holden, U. S. N., was the assistant on this instrument during the year.

In the Department of Chronometers the following officers were on duty for the periods specified, namely:

Lieutenant-Commander C. H. Davis, jr., U. S. N., from January 1 to June 1 and from October 23 to December 31; Lieutenant-Commander C. H. Pendleton, U. S. N., from January 1 to September 6; Lieutenant L. G. Palmer, U. S. N., from January 1 to October 3; Lieutenant C. H. Arnold, U. S. N., from January 1 to November 12; Lieutenant T. N. Lee, U. S N., from November 15 to December 31; and Lieutenant J. J. Brice, U. S. N., from December 1 to December 31.

The meteorological observations were made, under the supervision of Professor J. R. Eastman, U. S. N., by the watchmen of the establishment, Messrs. Thomas Hays, Dennis Horigan, and Nicholas Cahill.

Mr. W. F. Gardner, instrument-maker, executed all necessary repairs and alterations of the instruments and apparatus of the observatory.

Mr. Thomas Harrison, clerk and disbursing officer, had charge of the official correspondence and accounts of the establishment.

The observatory, being a naval establishment, is under the general supervision of the Bureau of Navigation of the Navy Department.

THE TRANSIT CIRCLE.

During the year 1875 the work with the Transit Circle was performed under the direction of Professor J. R. Eastman, U. S. N.

The Assistants were Messrs. Edgar Frisby and A. N. Skinner for the whole year; Mr. Ormond Stone from January 1 to March 20, and Mr. H. M. Paul from August 4 to the end of the year.

The regular observations with the Transit Circle were confined to seven classes of objects.

(1) Stars of the American Ephemeris, for the determination of clock corrections, azimuth corrections, and the corrections to the zenith point and the assumed latitude.

(2) Sun, moon, and planets.

(3) Stars whose occultations were observed at this Observatory and by the various American parties who observed the Transit of Venus in 1874.

(4) Stars selected for standard stars in the formation of a catalogue from the zone observations made here from 1846 to 1849.

(5) Stars used for latitude determinations by parties attached to the expedition of Lieutenant G. M. Wheeler, United States Engineers, in charge of explorations and surveys west of the one hundredth meridian.

(6) Stars used by Lieutenant-Commander F. M. Green, U. S. N., in his determinations of latitude in the West Indies.

(7) The stars of the British Association Catalogue between 120° 0′ and 131° 10′ N. P. D. that have not been observed here three times in right ascension and declination.

In May, 1875, an apparatus for determining absolute personal equation was mounted on a small table on the east side of the Transit Circle room, and was used during the remainder of the year to determine the personal equation of all the observers.

The apparatus hitherto used for observing stars by reflexion was discarded as worthless and one constructed on an entirely different plan.

THE OBSERVING-ROOM.

The interior of the observing-room, which has been occupied since February 2, 1870, measures 40 feet from north to south and 28 feet 3 inches from east to west. Its height, from the floor to the under side of the shutters which close the opening in the roof, is 23 feet 2 inches at the ridge and 19 feet 6 inches at the eaves. The ridge of the roof extends east and west. The opening in the roof has a width of 3 feet 8 inches, and extends downward, in the north and south walls, to within 7 feet 4 inches of the floor. The portion in the roof is closed by means of four sliding shutters, while that in the north and south walls is closed by double doors.

The inside of the walls of the frame on the east, south, and west sides is covered with tin, and the outside of the frame is protected from the direct rays of the sun by light, wooden louver-work. The northern wall is covered on the outside with tin. The outside is painted white and the inside light blue.

The latitude of the Transit Circle is the same as that of the center of the central dome of the Observatory, but in longitude it is 77.8 feet = $0^s.066$ west of that point.

DESCRIPTION OF INSTRUMENTS.

THE TRANSIT CIRCLE.

A detailed description of the Transit Circle, together with an account of the investigation of its constants, may be found in the Washington Observations for 1865. The following condensed description will be sufficient to render intelligible the explanation of the observations and their reduction.

This instrument was made by Pistor & Martins, of Berlin, in 1865. It is of the reversible pattern, and is mounted upon two massive marble piers, with its axis 8 feet 2 inches above the floor. The telescope has a clear aperture of 8.52 inches, and a focal length of 12 feet and 0.7 of an inch. The axis is cast in a single piece, into which the steel pivots, 2.09 inches in diameter and 1.7 inch long, are screwed. The **Y**'s are of gun-metal, and the bearing-surfaces are 0.28 inch wide. The distance between the centers of the bearing-surfaces is 3 feet 9.1 inches. The telescope-tube is made in two similar parts, which are bolted to the opposite sides of the cube which forms the central portion of the axis. This cube measures 16.64 inches on the edge.

Two circles, identical in form and size, are attached to the extremities of the axis. Each has ten radial arms, is cast in a single piece weighing about eighty pounds, is 45.3 inches in diameter at the outside edge, and 43.4 inches at the graduation. The circle on the clamp-end of the axis, known as circle A, has inlaid upon its face two bands of silver, each 0.13 of an inch wide, the inner one of which is graduated to every 2′, and the outer one to every 10′. The other, known as circle B, has inlaid upon its face a single band of silver 0.13 of an inch wide, which is graduated to every 2′. The graduation on each of these circles is numbered, from left to right, from 0° to 360°, and, as they face in opposite directions, when the telescope is moved in zenith distance, the reading of one circle increases while that of the other decreases. The circles are attached to the axis in such a manner that they may be adjusted to bring any desired divisions under the microscopes in a given position of the telescope. Each pier carries four micrometer microscopes placed at the extremities of two diameters, which intersect at right angles, and each of which makes an angle of 45° with the vertical. They are attached by means of metal arms, covered with wood, to the brass disk, on the face of the pier, which supports the **Y**'s. The microscopes on the western pier are marked I, II, III, IV; those on the eastern pier, V, VI, VII, VIII. The readings of the former diminish and those of the latter increase as the telescope moves from the zenith toward the south. These microscopes magnify about forty-five diameters; one revolution of their screws is equal to 30″, and their micrometer-heads are divided to 0″.5. Each microscope micrometer is furnished with two parallel threads about 12″ apart, and the reading is made when the image of the division on the limb of the circle appears to be exactly midway between the threads.

In addition to the microscopes already mentioned, each pier carries another, which is employed as a pointer for setting the telescope by means of the coarse graduation on circle A. These microscopes magnify twenty-three diameters, and are placed at the extremities of horizontal radii to the circles; that on the western pier being north and that on the eastern pier south of the axis. The setting microscope in actual use is always the one at the clamp end of the axis.

In the eye-piece of the telescope is a fixed reticule of fifteen vertical and two horizontal threads. The latter have a space of about 8″ between them, and are inserted principally to mark the center of the field. The notation, and the approximate equatorial intervals between each vertical thread and the mean of sets B and D, and C_2, C_3, and C_4, are as follows:

TABLE I.

	s.		s.		s.
I	36.8	C_1	4.1	D_1	8.2
II	24.5	C_2	2.0	D_2	9.7
III or B_1	12.3	IV or C_3	0.0	V or D_3	12.3
B_2	9.7	C_4	2.0	VI	24.5
B_3	8.2	C_5	4.1	VII	36.8

The threads B_1 to B_3 are known as set B; C_1 to C_5 as set C; and D_1 to D_3 as set D. The thread on the western side of the field is always known as I; therefore, when the instrument is reversed, the notation of the threads is reversed.

The eye-piece also contains a right-ascension and a zenith-distance micrometer in each of which the readings increase as the threads move from the micrometer-head. The right-ascension micrometer is provided with a single vertical thread, and is employed in determining the collimation constant, and sometimes in observing the transit of close circumpolar stars when clouds prevent observations at the fixed threads. The value of one revolution of the micrometer-screw is $1^s.024$. The zenith-distance micrometer is furnished with four horizontal threads, two of which are about 3″ apart, and the center of the space between them is regarded as the standard middle thread. The value of one revolution of this micrometer-screw is 15″.312. The other threads are placed at a distance of about 2′ 33″ on either side of the middle threads; that nearest the head of the micrometer being called thread A, and the other thread B. In observing southern stars, the micrometer-head is below the eye-piece if the clamp is west, and above it when the clamp is east. An increase of micrometer reading is subtractive from the reading of circle A, and additive to that of circle B. A self-registering apparatus is attached to the head of the micrometer-screw, in such a manner as to enable the observer to obtain a record of at least four bisections without removing the eye from the eye-piece.[1]

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[1] See Astronomische Nachrichten, No. 1493, p. 77.

The illumination of the field of view is so arranged that the threads can be shown either dark on a bright field or bright on a dark field. In the case of bright-field illumination, the color can be varied from deep red to dark blue.

The instrument is provided with five positive eye-pieces, magnifying respectively 135, 158, 186, 279, and 395 diameters. That magnifying 186 diameters is the one generally used.

Collimators.—The Transit Circle is provided with two collimators, having object-glasses of 35.2 inches focal length, and 2.1 inches clear aperture The eye-pieces have a power of 67. The collimators are mounted on sandstone piers, the one north and the other south of the Transit Circle, and 14.8 feet from the center of the instrument. The field of view of collimator A contains a vertical thread crossed at its middle point by a horizontal thread. The field of view of collimator B contains a fixed vertical thread, and two intersecting threads, movable by a micrometer-screw. Each of the intersecting threads makes an angle of 12° with the vertical. Collimator A is usually mounted on the south pier. Two levels are provided by which the collimators may be placed horizontal.

Each side of the central cube of the Transit Circle telescope is pierced with a circular opening, 2.3 inches in diameter, which is closed by a brass cap. By removing the caps, and setting the telescope vertical, the threads of either collimator may be seen from the other.

The Standard Sidereal Clock.—The sidereal clock, used in connection with the Transit Circle, is Kessels No. 1324. In order to provide against the effects of sudden changes of temperature, the clock, which is situated in the room adjoining the observing-room on the eastern side, is inclosed in a vault of heavy masonry lined with tin, and, to prevent the works of the clock from rusting, the dryness of the air is maintained by keeping a fire in the clock-room throughout the year. The clock has a gridiron pendulum, and is connected with the galvanic system of the Observatory by means of a platinum point which projects from about the middle of the pendulum-rod, and at each vibration lightly touches the surface of a small globule of mercury and closes the circuit. The clock is connected with the chronograph in the usual way.

The rate of the clock is controlled by means of small weights, which can be placed in a small cup attached to the pendulum-rod.

The Counting-Clock.—This clock is attached to a brick pier near the eastern wall of the observing-room. It was made by Parkinson and Frodsham, of London, and has a mercurial pendulum. Its rate is controlled by means of small weights placed on the top of the jar of mercury, and it is kept within less than half a second of the Kessels clock.

This clock contains a delicate spring, furnished with a platinum point, resting upon a small plate of the same metal; the whole so arranged that at the beginning of each minute an arm attached to the arbor of the seconds hand raises the spring and separates the point from the plate for nearly one second. Wires are attached to this apparatus so that if desired it may be included in the same circuit with the Kessels clock, when, if the beats of the two clocks are nearly in coincidence, the mark for the sixtieth second of the Kessels clock will be omitted on the chronograph.

The Standard Mean Time Clock.—This clock is attached to a stone pier in the chronometer-room, but the officer in charge of the Transit Circle is responsible for furnishing its errors and rates. It was made by Parkinson and Frodsham, of London, has a mercurial pendulum, and its rate is controlled by means of small weights placed on the jar containing the mercury. It is compared with Kessels No. 1324 by causing their beats to be recorded on the same chronograph, generally until a coincidence is obtained. This clock is considered the best in the Observatory.

The Chronograph.—This instrument is mounted on a wooden stand near the eastern wall of the observing-room. It is a modified form of the Hipp chronograph, in which regularity of motion in the train is secured by a spring making 132 vibrations a second. The barrel of the chronograph is 6.37 inches in diameter, 13.5 inches long, and revolves once in a minute. A sheet of paper fastened on the chronograph barrel by thin, metallic springs is sufficient to contain the record of two hours' continuous work, and the train requires winding only when the paper is changed. The clock-signals and those of the observer are recorded by a single pen. The armature of the magnet, which controls the pen, is provided with repeating-points for use in sending signals to distant stations when determining differences of longitude by telegraph. The pen-carriage is moved forward by an endless screw, but may be lifted from its bearings and moved backward or forward so that the pen may be placed upon any desired part of the chronograph sheet. The chronograph stops when the sheet is full. The record is made on paper of the quality of ordinary writing-paper with an ink that does not freeze at 0° F. The ink is made in the following proportions:

Water - - - - - - - - - - - - -	4 fluid ounces.
Alcohol - - - - - - - - - - -	2 fluid ounces.
Concentrated Glycerine - - - - -	1 fluid drachm.
Crystallized Aniline Blue - - - - -	40 grains.

This ink requires thorough filtering. The pen is of glass, and the lower part of the bulb is drawn out to a fine capillary tube, so that, when ink is placed in the bulb and the pen allowed to rest its whole weight on the paper, it produces a fine sharp line as the barrel revolves.

The Barometer and Thermometer.—The barometer is of the cistern form, and is suspended on the eastern wall of the observing-room, near its northeastern corner. This instrument has a tube about 0.3 of an inch in diameter, and the graduation may be read by means of a vernier to 0.01 of an inch. The thermometer has a Fahrenheit scale, and is graduated from $-36°$ to $+157°$. It is suspended 1 foot outside the north front of the observing-room, 13.5 feet above the grass, and is protected from radiation by a shield formed by a double roof of boards, the upper one covered with tin painted white, and three sides of wooden, double louver-work.

PERSONAL EQUATION APPARATUS.

The apparatus for determining the personal error of an observer in noting the time of the transits of stars was devised by Professor J. R. Eastman, U. S. N., in 1875, for his own use.

After repeated trials it was purchased of the maker, Mr. F. Kahler, for the Naval Observatory, where it has been in use to the present time. It may be said to consist of three parts: 1°, the motive power and train; 2°, the device for forming the artificial star and field, and, 3°, the methods of obtaining a record of the actual and observed transits of the artificial star.

1°. The motive power and train are those of an ordinary "Thomas" clock, with two springs, of the pattern usually mounted in octagonal wooden cases. The train A, Plate I, is attached firmly to a board, B, 14.0 inches long, 7.25 inches wide, and 0.5 inch thick, which serves as a foundation for the whole apparatus. Above the train lies a brass plate, C, 6 inches long and 5.25 inches wide, resting on firm wooden supports 3.9 inches high. The shaft of the escape-wheel of the train is lengthened and the motion of the train is regulated by fans of different sizes attached to this shaft, D.

The shaft of the minute hand is extended through the plate C far enough to receive a mutilated pinion, E, with a little more than half of the teeth removed.

On the top of the plate already mentioned a second brass plate, F, is moved between guides at the front and back alternately from side to side by means of the mutilated pinion which revolves between two racks attached to the upper plate in such a manner that as the last tooth on one side of the pinion is disengaged from the rack on that side the first tooth on the other side engages the opposite rack.

At the back of this plate is attached an arm, G, 3 0 inches long, carrying at its extremity a prism, H, of 45°, with one convex face. In front of this prism a thin, circular, brass plate, I, pierced with several small holes of different sizes is so mounted that it may be readily revolved by hand to bring any of the holes in front of the illuminated portion of the prism in order to vary the apparent magnitude of the artificial star.

The light from an ordinary observing-lamp or from a gas-burner, properly shaded, is conducted to the convex face of the prism through a lens, K, in the side of the shade. This light passes from the prism through a hole in the screen forward, and through a small lens, L, mounted in a sliding tube on the front of the upper sliding plate. About 1.6 inch in front of this lens is a ground glass plate, M, 1.7 × 1.1 inch, supported by a brass frame attached to the board, which carries the whole apparatus. On this plate are etched five fine lines to represent the ordinary transit threads of a telescope, and the lens is adjusted until a good image of the artificial star is thrown upon the ground glass plate.

Immediately below the ground glass plate is attached a thin platinum plate, N, face downward, with five very narrow grooves cut in the face and filled with shellac.

These grooves are the same distance apart as the lines on the glass plate. A flat and thin steel spring, O, with an adjustable, vertical style, P, at one end, is firmly attached at the other end by means of a clamp-screw, Q, to the front of the upper sliding plate, while the fine point of the style rests upon the lower face of the platinum-plate with sufficient pressure to insure good electrical connection.

The prism, lens, and the style constitute a fixed system moving with the upper sliding plate.

If the wire connecting an observing-key with a chronograph working with a closed circuit be divided, and one end connected with the upper sliding plate and the other end with the platinum plate, the circuit will be closed through the style and the platinum plate. When the train is started and a reciprocating motion communicated to the upper sliding plate by the pinion and racks, the circuit will be broken for an instant when the style crosses each line of shellac in either direction.

If the observer with the key in hand notes the instant when the star appears to be on the thread, there will be two marks on the chronograph.

In practice the style is so adjusted that, when the artificial star is moving from right to left, it reaches the line on the platinum-plate N about $0^s.5$ *after* the star appears to be on the corresponding thread, and the observer's mark appears first on the chronograph when the motion is from right to left, and last when the motion is in the opposite direction. When the star is moving toward the left the distance in seconds of time between the record (o) of the observer and the record (a) of the apparatus is composed of the error (e) of the observer and the error (x) of the adjustment of the style; that is, $o - a = -d = e - x$ when the motion is toward the left; when the motion is toward the right, $o - a = d' = e + x$, and therefore

$$e = \frac{d' - d}{2}.$$

With a good chronograph d and d' may be read directly from the chronograph record without using the absolute times o and a. When the adjustments of the apparatus and chronograph are so made that the length of the break of the apparatus on the chronograph is less than about $0^s.12$, the points from which the readings are made are the *beginning* of the observer's break and the *center* of the break of the apparatus. If for any reason the breaks of the apparatus should be appreciably longer than $0^s.12$, the reading for the apparatus record should be from the *beginning* of the break. The result thus obtained from each thread would require a correction of one-half the width of the thread in seconds of time *less* one-half the diameter of the bearing-surface of the end of the style in seconds of time. In the case of the adjustment of the style given on this page, this correction would be added to d and substracted from d'. The semidiameters of the threads and of the style can be easily measured with a micrometer microscope, and the values in time determined from the observed interval of time and the measured space between threads I and V.

The transits of the artificial star are viewed through a tube, R, 1.5 inch in diameter, which slides and revolves freely in a collar, S, supported on a pillar, T, in front of the apparatus. In the end of the tube, next the eye, is an aperture about the size of that in an ordinary eye-piece. When the distance between the eye end of the tube and the artificial threads is adjusted to suit the observer's eye, the field of view closely resembles that of an ordinary transit instrument. At night the field is illuminated by a lamp placed behind the apparatus.

By means of a prism of 45°, which may be thrown by a small lever, V, into the line of sight within the observing-tube, the star may be made to move apparently in any desired direction, enabling the observer to test the existence of an error depending on the direction of the star's motion.

The motion of the artificial star may be varied by means of different-sized fans from that of an equatorial star to one of 80° declination.

The observation of the star over each of the five threads while moving from right to left, and five observations when moving in the opposite direction, constitute one set, and it is customary to observe five sets for one determination of personal equation. The following is an exhibit of an actual observation made July 21, 1875, of five sets showing the method of determining the error of the observer.

	s.	s.	s.	s.	s.
d	0.50	0.60	0.60	0.60	0.62
	.48	.55	.70	.60	.64
	.48	.50	.55	.58	.60
	.55	.55	.55	.60	.65
	.55	.50	.55	.55	.60
d'	0.80	0.80	0.83	0.85	0.85
	.85	.80	.80	.85	.90
	.88	.88	.90	.95	.95
	.80	.88	.88	.90	.95
	.80	.90	.90	.86	.90
Mean $d =$	0.512	0 540	0.590	0.586	0.622
Mean $d' =$	0.826	0.852	0.862	0.882	0.910
$d' - d = +$	0.314	0.312	0.272	0.296	.288
$e =$	0.157	.156	.136	.148	.144

Mean value of $e = + 0^s.1482$

For this observer, then, the correction to the observed time of the transit of a star is $- 0^s.15$.

On several occasions the *relative* personal equations of the observers with the Transit Circle were determined with the personal-equation apparatus and by the observation of stars in the usual way, as a check on the work of the apparatus, with the following results. Five sets of observations with the apparatus and not less than four time-stars were observed by each person:

					By stars.	By apparatus.
					s.	s.
October	25,	1875,	Professor Eastman, Assistant Skinner;	E.—Sk.,	0.251	0.227
November	5,	1875,	Professor Eastman, Assistant Paul;	E.—P.,	0.174	0.173
December	6,	1876,	Professor Eastman, Assistant Paul;	E.—P.,	0.035	0.052
December	31,	1877,	Professor Eastman, Assistant Frisby;	E —F.,	0.052	0 044
March	13,	1878,	Professor Eastman, Assistant Frisby;	E.—F.,	0.052	0.054
March	23,	1878,	Professor Eastman, Assistant Paul;	E.—P.,	0.107	0.092

PLATE I.

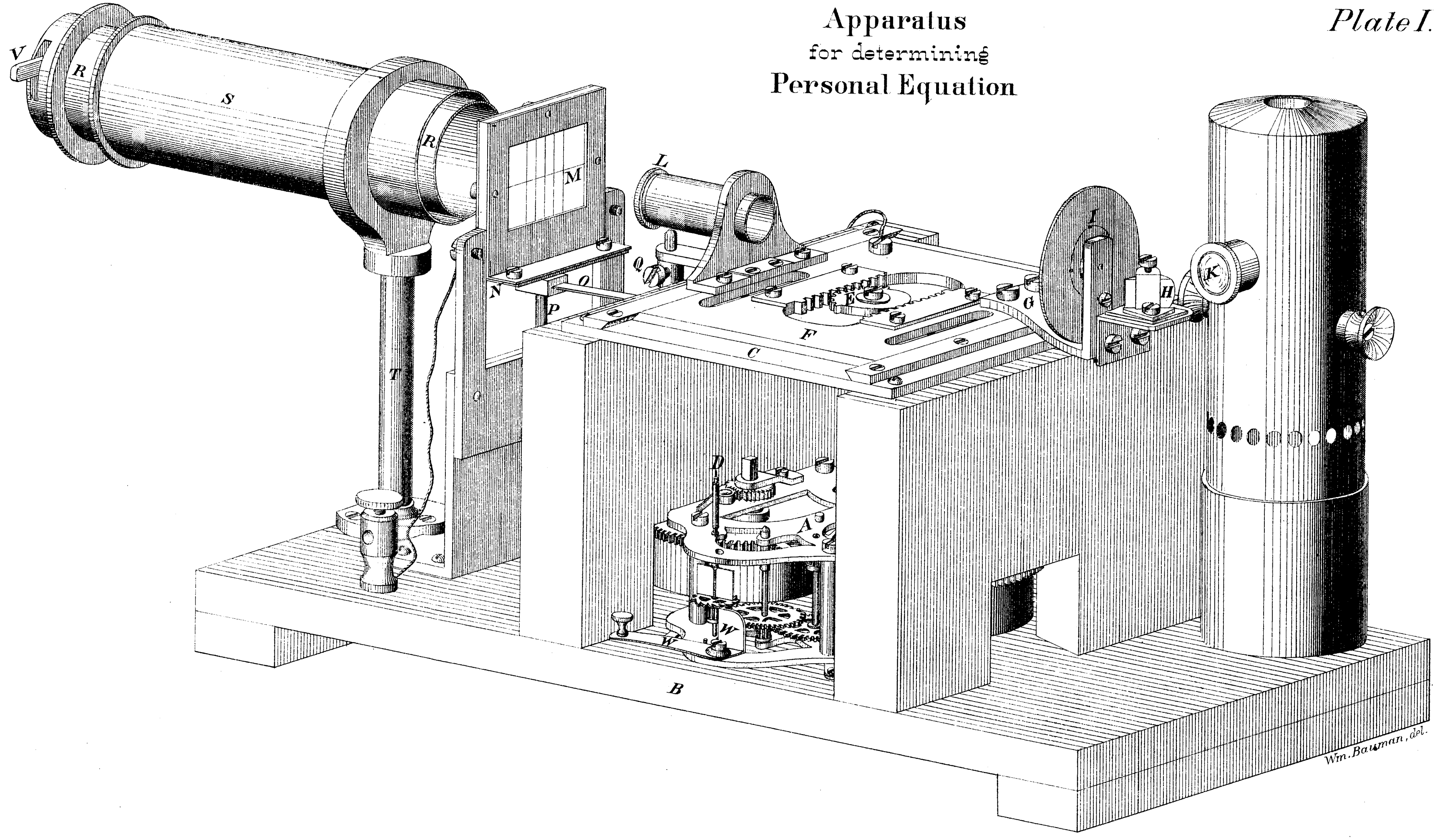
REFERENCES.

A	Clock train.
B	Wooden base which supports the apparatus.
C	Brass plate which supports the sliding-plate.
D	Lengthened shaft of escape-wheel on which the regulating fans are placed.
E	Driving pinion.
F	Sliding-plate.
G	Arm carrying the prism, etc.
H	Prism.
I	Thin brass plate pierced to regulate the size of the artificial star.
K	Lens in lamp shade.
L	Lens in sliding tube
M	Ground-glass plate representing the field of view.
N	Platinum contact-plate.
O	Steel spring.
P	Style.
Q	Clamp-screw.
R	Observing tube.
S	Collar carrying the observing tube.
T	Supporting pillar.
V	Lever carrying the prism for changing the direction of motion.
W	Break for stopping the train.

App. 1, Obs. 1875.

Plate I.

# Apparatus
for determining
Personal Equation



Wm. Bauman, del.

Reflection Apparatus.

The apparatus used for carrying the mercury employed in observing stars by reflection was constructed in 1875 and used for the first time on August 26.

The apparatus consists of a supporting framework, with a grooved post at each end, and a horizontal bar carrying the mercury. The frame is supported on four grooved wheels moving on two narrow rails about three feet apart These rails run north and south between the piers and are flush with the surface of the floor. The mercury box is of wood, 17.5 inches long, 10.1 inches wide, and 1.6 inch deep, and is supported by a bar of wood midway between the east and west ends of the frame. At each end, this bar is connected with the upper end of a vertical bar of hard wood carrying an iron rack. These vertical bars slide freely in grooves on the inner sides of the posts at the ends of the frame.

By means of these racks and two pinions controlled by a single crank and rod, with a ratchet, the mercury-box may be raised, and maintained at will, to any point within a limit of 26 inches. At its lowest point the apparatus is high enough to move freely north and south over the top of the observing couch and under the end of the telescope when it is vertical.

With this apparatus stars may be observed, both reflected and direct, at the same transit within the limits 18° to 52° zenith distance.

In practice, the rule was generally followed to make the bisections for the reflection observations at threads I and II and for the direct observations at VI and VII.

OBSERVATIONS WITH THE TRANSIT CIRCLE.

Position of Axis.—The system of observations with this instrument is based on the plan of reversing the axis at the beginning of each year, and at the same time shifting the position of circle B on the axis so that the north-polar distances of the same object will depend on different circle-divisions in different years. During the year 1875, the clamp end of the axis was east.

Arrangement of Work.—During the year 1875, there were four observers attached to the Transit Circle, who made all the observations and computations except such computations and copying as could be obtained for less than one thousand dollars. As a rule, each observer is held responsible for all the observations to be made during an "observing-day" of twenty-four hours, beginning at 9 a. m.

The usual observing-hours are from 9 a. m. to 3 p. m. and from 8 p. m. to an hour late enough to observe whatever small planets may be near opposition. It is a rule to observe the moon whenever it can be seen at time of transit, and on Sundays the only observations regularly made are those of the moon and of stars necessary for the determination of time and instrumental constants.

Generally, in clear weather, it is designed to observe a group of at least three "time stars" in the forenoon and three in the afternoon, and also a similar number near the beginning and the end of the work at night.

The azimuth constant is considered invariable throughout the "observing day"; but the collimation and level constants and the zenith-point correction are generally determined at about the middle of the observations for each day and each night. If the observations are prolonged to a very late hour at night these constants are generally determined twice.

The number of observations to be obtained in an "observing-day" has not been fixed, for, with rare exceptions, the zeal of the observers leaves no necessity for fixing a minimum limit.

Method of Observing.—A galvanic current, closed by the Kessels clock, controls the chronograph-pen, and all observations of time are made by the aid of its recorded beats. Therefore, the first duty of the observer is to put the counting-clock in coincidence with the Kessels. Then the counting-clock serves to indicate the second corresponding to each beat of the chronograph-pen, and when included in the clock circuit, it also indicates the beginning of each minute on the chronograph by causing the pen to omit the mark corresponding to the sixtieth second.

The general method adopted in using the Transit Circle is to bring the proper divisions of circle B near the zeros of its micrometer microscopes, and then to measure with the zenith-distance micrometer of the telescope the distance between its zero-point and the image of the object observed. The subdivision of the intervals between consecutive divisions on circle B is thus thrown entirely on the zenith-distance micrometer, and as the arc measured by the micrometer microscopes rarely exceeds 10″ their errors of run are neglected. The graduation of circle B is considered better than that of circle A, and is consequently employed in all measures of zenith distance. Circle A is used only as a setting circle, to indicate the degrees and minutes of zenith distances, and its position on the axis is never changed. If a collimating eye-piece is attached to the telescope, its zenith-distance micrometer set at 35 revolutions, and the instrument turned until the central micrometer-wires coincide with their own images reflected from the surface of mercury, the reading of the horizontal microscope of circle A will be 179° 56′, and some divisions of circle B will be found very nearly under the zeros of its micrometer microscopes.

Let

R denote the reading of the horizontal microscope of circle A when the telescope points to the zenith;

φ, the latitude of the Transit Circle;

δ, the declination of the object;

r, the refraction of the object;

Then, when the clamp is west, the telescope must be set so that the reading of the horizontal microscope of circle A will be,

For a direct observation - - - - - - $R - \varphi + \delta \pm r$

For a reflection observation - - - - - $180^\circ + R + \varphi - \delta \mp r$

If the clamp is east, the reading will be,

For a direct observation - - - - - - $R + \varphi - \delta \mp r$

For a reflection observation - - - - - $180^\circ + R - \varphi + \delta \pm r$

If the true value of φ were substituted in these expressions, whenever the computed setting was not exactly an even minute, it would be necessary to set on the *nearest* even minute. In practice, it is found much more convenient to set on the *next* *less* even minute; and, in order to avoid measuring more than half the distance between two consecutive divisions on the circle with the zenith-distance micrometer, a fictitious value of φ is used. The fictitious latitude is $\varphi + 1'$ for a direct observation with clamp east, and a reflection observation with clamp west; and $\varphi - 1'$ for a direct observation with clamp west, and a reflection observation with clamp east. The formulæ actually employed for computing the settings are, therefore,

For a direct observation, clamp east - - - $38^\circ\ 50'.6 - \delta \mp r$
For a reflection observation, clamp east - - $141^\circ\ 3'.4 + \delta \pm r$
For a direct observation, clamp west - - - $321^\circ\ 3'.4 + \delta \pm r$
For a reflection observation, clamp west - - $218^\circ\ 50'.6 - \delta \mp r$

In these formulæ, r is taken with the upper sign for an object south, and with the lower sign for an object north of the zenith. For the moon, r is made equal to the sum of the refraction and parallax. In observing faint objects, it is often desirable to know the approximate reading of the zenith-distance micrometer for the point at which the object will enter the field of view. In both positions of the clamp, the reading is computed from the formula,

$$\text{Micrometer reading} = 39 \text{ revolutions} - \frac{\varepsilon}{R}$$

where ε is the difference between the computed setting and the next less even minute, and R is the value of one revolution of the micrometer-screw.

The adopted mode of observing is to move the zenith-distance micrometer until the image of the star or of the limb of the sun, moon, or planet bisects the space between the two middle threads of the micrometer, and this operation is called, in this introduction, briefly, *bisecting* the object. It is not easy to observe very faint objects in this way, and such are bisected with the threads A or B. These latter threads are also used, in order to avoid moving any thread more than two minutes, when observing two or more objects on the same setting, differing more than two minutes in declination. All bisections are made by always moving the micrometer-threads *from* the head. The microscope-micrometer threads are always moved *toward* the head. The readings of the zenith-distance micrometer are taken from the self-registering indexes after the completion of each observation.

Three persons are usually employed in making a complete observation of the four limbs of the sun, though it is sometimes accomplished by two. The setting for the north and south limbs is computed, a paste-board cap with a circular aperture three inches in diameter is put over the object-glass, a shade-glass is placed on the eye-piece, and the telescope set for the position of the sun's center. About two minutes before the predicted time of transit of the sun's center, the shutters are opened, and the observer notes the time of transit of the preceding limb over the eleven transit threads in the usual way. The assistant at circle A now sets the telescope for the observation of one of the horizontal limbs, and, while the observer is making the bisections at threads I and II, the assistant at circle B reads the four microscopes. This done, the telescope is set for the other limb, the bisections at threads VI and VII are made, and the assistant at circle B again reads the four microscopes. The telescope is then unclamped and moved until the following limb is in the field, when its transit over all the threads is observed. The shutters are then closed, and the observation completed by making the usual observations of the external thermometer, barometer, and attached thermometer. During the observation, the circles are protected from the direct rays of the sun by the steps and platform used in observing the nadir point.

In observations of the moon, if the preceding limb is the full one, the settings for the center and for the full horizontal limb are computed and the instrument set for the center, but not clamped. The transit of the preceding limb is then observed, and the observer going to circle A sets the instrument on the full horizontal limb. Returning to the eye-piece, he makes the bisections usually at threads II, III, IV, V, and VI. The observation is completed by reading the microscopes of circle B.

If the following limb is full, the telescope is set for the position of the full horizontal limb, and the microscopes are read before the moon enters the field. After the bisections are made, the telescope is unclamped and moved till the following limb is in the field, when the transit is observed in the same way as for the preceding limb.

When the larger planets are observed, the bisections of one limb are made at threads I and VII, and of the other at II and VI. The transit of the preceding limb is usually observed at sets B and D, and of the following limb at set C, though this order is sometimes reversed.

Planets which do not present a well-defined disk are observed in the same manner as fixed stars.

The general plan for observing fixed stars is as follows:

(1) If the star is within 5° of the pole, the transit is observed by eye and ear at the threads of set C, and it is bisected at C_1, C_3, and C_5, or sometimes at all the threads of the set.

(2) If the star is situated between 5° and 20° of polar distance, the transits over set C are recorded on the chronograph in the usual way, and it is bisected at any two of the threads B_1, B_3, D_1, D_3; preference being given to the combinations B_3, D_1, or B_1, D_3, which make the observation symmetrical.

(3) If the polar distance of the star exceeds 20°, its transit over the eleven threads is recorded on the chronograph, and the bisections are made at any two of the threads I, II, VI, VII; preference being given to the combinations II, VI, or I, VII. Sometimes bisections are made at each of the threads I, II, VI, VII.

(4) In the case of double stars, the transit of one component is usually observed over sets B and D, and of the other over set C. The bisection of one component is made at threads I and VII, and of the other at threads II and VI.

In observing transits by eye and ear, the beat of the chronograph-pen is used and not that of the counting-clock.

Thread Intervals.—In the reduction of the observations for 1875, from January 1 to December 14, the thread intervals used were determined in 1874 and 1875 from transits of 64 stars south of the zenith and 22 stars north of the zenith. An equal number were observed with clamp west and clamp east. The mean of the probable errors for each thread was less for stars south of the zenith than for those north, but the mean of all the observations was adopted for the final result. On December 14 several of the transit threads were broken and a new determination of the intervals was afterward made from observations of 14 circumpolar stars and 15 stars with declination less than + 48°.

The two results are given below :

Table II.

Before December 14.			After December 14.		
s.	s.	s.		s.	s.
B_1 + 12.262	C_1 + 4.097		B_1 + 12.264	C_1 + 4.082	
B_2 + 9.713	C_2 + 2.054		B_2 + 9.699	C_2 + 2.046	
B_3 + 8.159	C_3 + 0.002	D_1 − 8.171	B_3 + 8.157	C_3 − 0.002	D_1 − 8.165
	C_4 − 2.052	D_2 − 9.696		C_4 − 2.025	D_2 − 9.701
	C_5 − 4.096	D_3 − 12.271		C_5 − 4.090	D_3 − 12.263

In reading all complete observations from the chronograph sheets the records for C_1 and C_5 are omitted, and the remaining nine threads are considered the standard set.

The Zenith-Distance Micrometer-Screw.—From a series of observations made in 1873, the value of one revolution of the zenith-distance micrometer-screw was found to be 15″.312, and this value has been used in reducing the observations made in 1875.

When the close pair of micrometer-threads occupies the center of the space between the fixed horizontal threads, the reading of the micrometer-screw is 40 revolutions, and the reading increases as the threads move from the micrometer-head.

The Right-Ascension Micrometer-Screw.—The adopted value of one revolution of this screw is $1^s.024$. This value was determined by measuring the intervals between the transit threads, which had been determined by the transits of stars near the pole.

Inclination of Threads.—The corrections for inclination of micrometer-threads in 1875 are given in the table below.

Table III.

	Before December 14.			After December 14.		
Vertical Thread.	Inclination of Central Threads.	Correction for Thread A.	Correction for Thread B.	Inclination of Central Threads.	Correction for Thread A.	Correction for Thread B.
	″	′ ″	′ ″	″	′ ″	′ ″
I	− 0.40	+ 2 32.56	− 2 33.41	+ 1.46	+ 2 33.79	− 2 32.38
II	0.26	2 32.67	2 33.22	0.97	2 33.25	2 32.90
III	− 0.13	2 32.79	2 33.04	+ 0.49	2 32.71	2 33.41
IV	0.00	2 32.90	2 32.85	0.00	2 32.17	2 33.93
V	+ 0.13	2 33.01	2 32.67	− 0.49	2 31.63	2 34.45
VI	0.26	2 33.13	2 32.48	0.97	2 31.09	2 34.96
VII	+ 0.40	+ 2 33.24	− 2 32.30	− 1.46	+ 2 30.55	− 2 35.48

The corrections for A and B in the above table contain, besides the correction for declination, the reduction to the middle pair of threads.

Collimation Constant.—The collimation constant is determined by means of the collimators, without reversing the instrument.

The covers of the opening through the central cube of the telescope are removed, and the instrument turned until the horizontal thread in collimator A appears in the field at about 35 revolutions. Then, by means of the screws acting against the **Y**'s of collimator A, its vertical thread is moved until it is seen very near the image of C_3 in the telescope. Three measures of the small distance between C_3 and the image of the vertical thread in the collimator are then made with the right-ascension micrometer by moving its thread until the collimator thread bisects the space between the movable thread and C_3, and by obtaining a coincidence between C_3 and the movable thread. The deviation will be half the space measured by the movable thread.

The telescope is then pointed to the zenith, and the micrometer of collimator B is moved until the intersection of its cross-threads is exactly on the image of the vertical thread of collimator A. The telescope is then pointed on collimator B, and four measures made of the distance between C_3 and the intersection of the cross-threads. These measures are made in the same manner as those on the vertical thread of collimator A.

The telescope is again pointed to the zenith, and the adjustment of the vertical thread of collimator A on the cross-threads of collimator B is examined. If it is imperfect, it is readjusted, and another set of measures similar to the first is made. The mean of the first and last sets of measures is taken as the true distance of C_3 from the image of the vertical thread of collimator A. Care is taken to determine the value of C_0 when the temperature is changing very slowly.

In the computation of the constant from these data in 1875,

$c_\tau =$ the sum of the collimation constant at the temperature τ° Fah., and the constant of diurnal aberration;
$c_0 =$ the sum of the same constants at the temperature 0° Fah.;
$M =$ the distance, in micrometer revolutions, of the image of the vertical thread of collimator *A east* of c_3;
$M' =$ the distance, in micrometer revolutions, of the image of the intersection of the threads in collimator *B east* of c_3;
$R =$ the value, in seconds of time, of one revolution of the micrometer-screw $= 1^{s}.024$;
$\varphi =$ the latitude of the Observatory;
$i =$ the reduction of the position of c_3 to the mean of the set of nine wires $=$ before December 14, $+\,0^{s}\,002$; after December 14, $-\,0^{s}.002$

Then, if M and M' have been observed at the temperature τ° Fah.,

$c_\tau = \frac{1}{2}\,(M + M')\,R - 0^{s}.021 \cos\varphi - i = 0^{s}.512\,(M + M') - 0^{s}.018$ before December 14, and $0^{s}.014$ after December 14.

In the Transit Circle the collimation varies with the temperature, and from a discussion of many observations, made at widely different temperatures, it has been found that

$$c_0 = c_\tau \mp 0^{s}.004\,\tau$$

where the upper sign is used when the clamp is east, and the lower when it is west.

As the value of c_0 has been found to be very steady throughout the year for several years, it is usually determined two or three times a month. For special observations on other days, the value of c_0 is obtained by interpolation, and from it, and the observed temperature at the time, the actual collimation constant is obtained from the formula

$$c_\tau = c_0 \pm 0^s.004\ \tau$$

For the final reduction of observations with the Transit Circle, a constant value of c_0 is used throughout the year. The value used is the mean of all the values determined by observation.

The Level Constant.—The instrument employed is a hanging level. Its tube is three-quarters of an inch in diameter, ten inches long, and has a chamber at one end, so that the length of the bubble is adjustable. It seems to be most sensitive when its length is about 1.25 inch. The scale is numbered continuously from end to end, the numbers running from 0 to 90. The length of one division is about 0.09 inch, and its value is $0^s.058$.

In using the level, it is always reversed twice, giving two readings with it direct and two with it reversed.

In computing the constant from the observations,

b = the level constant;

W and E = the sum of the two readings of the west and east ends of the bubble with the level in its first position;

w and e = the sum of the two readings of the west and east ends of the bubble with the level reversed:

Hence,

$$b = 0^s.00725\ [(W+E)-(w+e)]$$

When the $\left\{\begin{matrix}\text{west}\\ \text{east}\end{matrix}\right\}$ end of the bubble gives the greatest reading, the sign of b is $\left\{\begin{matrix}+\\ -\end{matrix}\right\}$

A careful examination of the pivots indicates that they are sensibly round and equal in diameter.

The Azimuth Constant.—The azimuth constant is generally determined from the observed transit of some of the "azimuth stars"—Polaris, δ Ursæ Minoris, 51 Cephei, or λ Ursæ Minoris—by means of the formula

$$a = \frac{\alpha - (T + \varDelta T + Bb + Cc)}{A}$$

where a, b, and c are the azimuth, level, and collimation constants; A, B, and C, the azimuth, level, and collimation factors; α, the adopted right ascension of the star; T, its observed time of transit; and $\varDelta T$, the approximate clock correction at T. When the same star is observed, both above and below the pole, on the same observing-day, the mean of the constants derived from those observations is adopted for the azimuth constant for that observing-day.

If no star is observed above and below the pole, the adopted constant is the mean of the results obtained from such azimuth stars as have been observed.

If from any cause no azimuth stars are observed, the constant is derived from the observed places of all the known stars by the method of least squares.

The Zenith-Point Correction.—This constant is determined from observations of the nadir point with a Bohnenberger eye-piece in the following manner:

(1) The telescope is pointed downward over a box of mercury, set so that the circle reading is 179° 56′, and the four microscopes at circle B are read;

(2) Two readings of the zenith-distance micrometer are then taken by moving the close pair of micrometer-threads until the space between them and their images appears equal to the distance between the two threads, the threads being nearer the head of the micrometer.

(3) Four readings of the micrometer are next made in the same way as before, except that the threads are placed the other side of the images.

(4) Two more readings of the micrometer are then made in the same manner as the first two, and the microscopes at circle B are again read.

The mean of the eight micrometer readings will give the reading for the coincidence of the two threads and their images. The second circle reading is taken for a check on the first.

The observations are reduced by means of the formula:

$$\text{Zenith-Point Correction} = \left\{\begin{array}{l} 180^\circ + \text{Division Correction for Circle B} \\ \quad + \text{Correction for Flexure of Circle B} \\ \quad + \text{Correction for Flexure of Telescope} \\ \quad - \text{Constant added to Reduction to Meridian} \end{array}\right\}$$

$$- \left\{\begin{array}{l} 179^\circ\ 56' \pm 10 \text{ Revolutions of Micrometer Microscopes} \\ \quad \mp \text{Observed Reading of Micrometer Microscopes} \\ \quad + \text{Micrometer Equivalent corresponding} \\ \qquad \text{to the sum of the Observed Reading} \\ \qquad \text{of the Zenith-Distance Micrometer} \\ \qquad + 0^{\text{r}}.250. \end{array}\right\}$$

The values of the division and flexure corrections are found by means of the formulæ for reflection observations in Tables IV to VII. The constant added to the reduction to the meridian is 1″.80. In the terms relating to the micrometer microscopes, the upper signs are to be taken when the clamp is east and the lower when it is west.

The value of the first term in the expression for the zenith-point correction is a constant, and, in 1875, the different terms were obtained as follows:

In 1875, the clamp was east; circle B was used; the reading of the horizontal microscope, when the telescope was pointed to the zenith, was $46^\circ.0 = R_0$, and the distance of the nadir point from the reflected pole was $51^\circ.1 = \varDelta$. With these data, Table V gives 46°.0 as the argument with which to enter Table IV to find the division correction, 0″.00. With the same data, Table VI gives the correction for circle flexure −0″.01; and Table VII gives the correction for flexure of telescope −0″.29. Hence, the

	°	′	″
Nadir constant is	180	0	0
Correction for errors of division is			0.00
Correction for flexure of circle is			— 0.01
Correction for flexure of telescope is			— 0.29
Constant added to reduction to meridian is			— 1.80
	179	59	57.90

The second term is simply the concluded circle reading when the clamp is east.

The correction $+0^{\mathrm{r}}.250$ to the reading of the zenith-distance micrometer is necessary, because the head of that micrometer has four indexes, and the one used in the nadir observation reads $0^{\mathrm{r}}.250$ less than that employed in other observations.

The observations of the nadir point made in 1875, together with the resulting zenith-point corrections, will be found in Table E of this introduction.

The first column gives the mean day, and the second column gives the sidereal hour to the nearest tenth. The third column contains the observer's initial. The fourth column contains the Circle Reading. The fifth column contains the mean of the two readings of the micrometer microscopes when the telescope was pointed to the nadir.

The divisions of circle B, on which the readings were actually made, are:

	°	′
For microscope I	181	0
For microscope II	271	0
For microscope III	1	0
For microscope IV	91	0

The sixth column contains the concluded circle reading. The seventh column contains the reading of the zenith-distance micrometer for the coincidence of the threads with their images. The complete nadir reading is found in the eighth column. The ninth column contains the nadir constant, and in the last column is found the adopted zenith-point correction.

OBSERVATIONS WITH THE TRANSIT CIRCLE.

These observations will be found on pages 1 to 221. In printing, the rule has been adopted to give the data as recorded by the observer, without alteration in any case whatever. When, in rare cases, the record seems to be erroneous or deficient, the error or change is explained in a foot-note. Where there is no reasonable doubt of the nature of an error, the necessary correction is introduced at the most convenient point in the progress of the reductions.

The observations of right ascension are printed on the left-hand pages.

The *first* column contains the day of the observation, which begins with the transit of the sun.

The *second* column contains the reference number.

The *third* column contains the name of the object. In the case of the sun, moon, and planets, the part observed is always specified; I and II indicating respectively the preceding and following limbs; N. and S., the north and south limbs; and C., the center. When one component of a double star is observed, it is always the brighter of the two, unless otherwise designated.

The *fourth* column contains the initial of the observer, as follows:

E.—Professor J. R. Eastman, U. S. N.
F.—Assistant Edgar Frisby.
S.—Assistant Ormond Stone.
Sk.—Assistant A. N. Skinner.
P.—Assistant H. M. Paul.

The *nine* columns from the fifth to the thirteenth contain the seconds and tenths of the observed time of transit over each thread. Objects observed over the standard set of nine threads, viz, set B, C_2, C_3, C_4, and set D, are recorded in the columns I to IX; those observed over only set C, in the columns III to VII; those observed over only sets B and D, in the columns I to III and VII to IX; those observed over only sets B and C, in the columns I to VIII; and those observed over only sets C and D, in the columns II to IX.

In the case of irregular observations, the threads can generally be identified by means of the recorded intervals or marginal notes.

Transits below the pole are recorded in the reverse order of that actually observed, so that the record for each thread occupies the same column that it would have done if the transit had been above the pole.

The *fourteenth* column contains the time of transit over the "mean thread", whose position is the mean of the standard set of nine threads When stars are observed over other or less threads than the standard set, the recorded transit over each thread is reduced to the "mean thread" by means of the known thread intervals.

In the case of other objects, the reduction for each thread is corrected for the motion of the object during the interval between each thread and the "mean thread".

The *fifteenth* column contains the sum of the instrumental corrections, or the quantity

$$Aa + Bb + Cc$$

where a, b, c are the constants, and A, B, C are the factors for azimuth, level, and collimation.

The formulæ for computing A, B, and C are:

$$A = \sin(\varphi - \delta) \sec\delta = \sin\varphi - \cos\varphi \tan\delta$$
$$B = \cos(\varphi - \delta) \sec\delta = \cos\varphi + \sin\varphi \tan\delta$$
$$C = \sec\delta$$

in which φ is the latitude of the observatory, and δ is the declination of the object observed.

The reductions of transit observations with the Transit Circle are made by means of tables giving the values of Aa, Bb, and Cc for each degree of zenith distance, and for each $0^s.01$ of the constants a, b, c, from $0^s.01$ to $0^s.50$. These tables may be found in Appendix I to the Washington Observations for 1872.

A general table of the values of the factors *A*, *B*, and *C* may be found on page xlvii of the Introduction to the Transit Circle in 1873.

Table B, following this introduction, contains the adopted values of the instrumental constants for all occasions on which observations were made. The first column gives the mean date to the nearest tenth of a day. The second column gives the approximate mean temperature for the date which is used in computing the collimation constant from the absolute determinations contained in Table A. In Table B, τ is the mean of the sum of the readings of the attached thermometer at the beginning and end of the observing period indicated by the date, and of the upper thermometer at the time the nadir was observed. The third, fourth, and fifth columns contain respectively the adopted values of the collimation, level, and azimuth constants.

The *sixteenth* column contains the apparent clock corrections given by direct observation of stars of the American Ephemeris situated within 40° of the equator. The adopted apparent right ascensions of these stars are obtained by applying the corrections given in Table C to the apparent right ascensions given in the American Ephemeris.

Table C contains the corrections deduced in Appendix III, Washington Observations for 1867, subsequently corrected by $-0^{s}.03$; and these modified corrections have been used in the reduction of observations with the Transit Circle in 1870, 1871, 1872, 1873, 1874, and 1875, with the exception of the correction for α Canis Minoris, which was changed in 1872 from $-0^{s}.14$ to $-0^{s}.16$.

The *seventeenth* column contains the adopted clock correction for each object observed, computed for all stars of the American Ephemeris from the data in Table D.

Table D is constructed upon the assumption that for each observing-day the mean of all the apparent clock corrections obtained by the same observer corresponds to the mean of the times at which they were observed.

The first column contains the mean date, together with the sidereal hour and tenth corresponding to the mean of the right ascensions of all the clock-stars observed. The corresponding mean of the apparent clock corrections is found in the third column. The second column contains the observer's initial. When clock corrections are obtained by more than one observer on the same day, the results are given separately for each observer.

The corrections for personal equation of the observers on the Transit Circle for 1875 were determined by the Personal Equation apparatus, and the results were as follows—the small subscript figures denoting the number of determinations by each observer, and the correction is to be applied to the observed time:

	s.	s.
Professor J. R. Eastman, from January 1 to June 20,	-0.132_{12}	± 0.003
Professor J. R. Eastman, from June 20 to December 31,	-0.176_{15}	± 0.002
Assistant E. Frisby, from January 1 to December 31,	-0.064_{11}	± 0.003
Assistant A. N. Skinner, from January 1 to December 31,	$+0.057_{8}$	± 0.003
Assistant H. M. Paul, from August 7 to August 27,	-0.040	
Assistant H. M. Paul, from September 1 to September 30,	0.000	
Assistant H. M. Paul, from October 9 to December 22,	$+0.026$	

The correction —0^{s}.10, for Assistant O. Stone's personal equation from January 1 to March 20, was obtained by comparison of observations of stars with other observers

Applying these quantities to the numbers in the third column produces the numbers in the fourth column, which contains the clock corrections corrected for personal equation. The quantities in the fifth column are obtained by dividing the difference between two consecutive values in the fourth column by the corresponding interval, in days, in the first column.

The adopted daily rate of the clock, in the sixth column, is obtained by taking the mean of the apparent rates for two intervals, one of which immediately precedes and the other follows the epoch of the clock correction

A slight inspection of Table D will enable one to see that the rates of the Kessels clock are unsteady even when determined from observations separated by quite long intervals. This fact has led to the determination of the clock corrections for the sun, moon, planets, and all miscellaneous stars by a different method. So far as was possible, in 1875, at least three "time stars" were observed in the forenoon and a like number in the afternoon, and the clock correction and the rate for the day for all objects, save stars from the American Ephemeris, was determined from these two groups. Similar groups were observed near the beginning and the end of the work of each night and the correction and rate obtained in the same way.

As far as possible, the observations were always confined to the same stars for each group. These corrections will be found in Table D$_1$

The *eighteenth* column contains the apparent right ascension of each object, or the sum of the fourteenth, fifteenth, and seventeenth columns, and in all cases has reference to that part of the object which was actually observed.

The *nineteenth* column contains,

(1) The corrections given by each observation to the right ascension of the stars of the American Ephemeris.

(2) The reduction for all other stars to their mean position for the fictitious epoch 1875.0. This reduction is computed with the constants of the American Ephemeris, and no proper motion is applied.

(3) The sidereal time of the semi-diameter of the sun, the moon, or a planet passing the meridian, when only one limb is observed, as given in the American Ephemeris. In the case of the sun, the Ephemeris time has been corrected for the personal equation of the observer, which was determined from all the observations of the year

The right-hand pages of the "Observations with the Transit Circle" contain the observations of north-polar distance.

The *first* column contains the reference number.

The *second* column contains the degrees and minutes indicated by the horizontal or setting microscope of circle A. Designating these degrees and minutes by *R*, the divisions of circle B actually observed by its micrometer microscopes were:

	°	′
For microscope I	0	56 — *R*
For microscope II	90	56 — *R*
For microscope III	180	56 — *R*
For microscope IV	270	56 — *R*

The *third*, *fourth*, *fifth*, and *sixth* columns contain the readings of the micrometer microscopes of circle B. The numbers at the heads of the columns correspond with those on the microscopes. The whole revolutions of microscope I are always 10, unless otherwise noted. Owing to imperfect adjustment, the same number of revolutions does not apply to all the microscopes; but these are readily inferred from that given for microscope I.

The *seventh* column contains the whole revolutions of the zenith-distance micrometer-screw for the first bisection of the object, and the *eighth*, *ninth*, *tenth*, *eleventh*, and *twelfth* columns contain the thousandths of a revolution of the micrometer-screw for each bisection of the object.

The vertical threads at which the bisections were made are indicated as follows: For objects within 5° of the pole, the columns eight to twelve refer to the threads C_1 to C_5; but, for other objects, they refer to threads I, II, IV, VI, and VII. Whenever this rule is not observed, a foot-note is employed to explain the manner of making the bisections. The foot-note "Bisections at sets B and D" refers to the threads B_1, B_3, C_3, D_1, and D_3.

The *thirteenth* column contains the zenith-point correction. This quantity is generally taken directly from the last column of Table E, and is constant for each group of observations; but, when there is conclusive evidence that the correction is changing considerably, its value for each observation is interpolated from the observed values.

When a group of observations was made, and from any cause no nadir observation could be obtained, the zenith point correction was obtained by comparing the observed north-polar distances of the different stars of the group with the mean north-polar distances found for the same stars throughout the year

The *fourteenth* column contains the *apparent zenith distance south* of each object, measured continuously from the zenith toward or through the south to the object.

This distance is the sum of

(1) The approximate zenith distance south;
(2) The micrometer equivalent;
(3) The reduction to the meridian;
(4) The correction for inclinations of threads and motion of object;
(5) The correction for the thread employed in the bisections;
(6) The zenith-point correction taken from the preceding column.

(1) When the clamp is east the approximate zenith distance south is equal to the reading of the horizontal microscope of circle A, minus the excess of the mean of the readings of the micrometer microscopes of circle B above ten revolutions. When the clamp is west, it is equal to 359° 52′, minus the reading of the horizontal microscope of circle A, plus the excess of the mean of the readings of the micrometer microscopes of circle B above ten revolutions.

(2) The micrometer equivalent of the readings of the zenith-distance micrometer, if the clamp is east, is

$$2'\ 0''.0 + R\ (40^{\mathrm{r}}.000 - r)$$

if the clamp is west, it is

$$4'\ 0''.0 - R\ (40^{\mathrm{r}}.000 - r)$$

In these formulæ r is the mean of the readings of the zenith-distance micrometer, expressed in revolutions; R, the mean value of one revolution between r and 40.0 revolutions, and the numerical term is a constant added to make the zenith-point correction always positive.

In practice, the micrometer equivalents are taken from a table where the values are tabulated for each $0^{r}.01$ from $24^{r}.3$ to $47^{r}.8$.

(3) The reduction to the meridian is computed from the formula

$$\begin{aligned}\mu &= 1''.80 - 112.5 \sin 1'' \, i^2 \tan \delta \\ &= 1''.80 - [6.7367] \, i^2 \tan \delta\end{aligned}$$

where μ is the reduction to the meridian, in seconds of arc; i, the equatorial interval, in seconds of time, between the mean thread and the thread at which the bisection was made; δ, the declination of the object; and $1''.80$ is a constant introduced to make μ generally positive. The values of μ are tabulated for all the vertical threads and for each degree of declination.

Where bisections are made away from the vertical threads, the time of the bisection is noted, and the correction is computed from the formula

$$\mu = 1''.80 - [6.4357] \, I^2 \sin 2\delta$$

where I represents the distance of the object from the meridian at the time of bisection, and the other terms are the same as before.

(4) The corrections for inclination of threads given on pages XXIX and 3 were derived from a large number of observations at threads I and VII; and the correction for motion of object in unsymmetrical observations is computed from the formula

$$\Delta' = \frac{\Delta}{3600} I$$

where Δ' is the correction for motion, and Δ the hourly motion of the object in declination, both expressed in seconds of arc; I is the interval, in seconds of time, between the mean thread and the thread at which the bisection was made.

(5) In observations where threads A or B were employed, the correction for the distance of the thread from the central pair of threads was required, and the value of this correction is found on pages XXIX and 3.

(6) The zenith-point correction is taken directly from the thirteenth column of the observations.

The *fifteenth* column contains the reading of the thermometer used to determine the temperature of the air.

The *sixteenth* column contains the correction for refraction computed from Bessel's formula, employing the tables given in the Appendix to the Washington Observations for 1845.

The *seventeenth* column contains the apparent north-polar distance of each object, or the adopted co-latitude, $51^\circ\ 6'\ 21''.2 \pm$ the sum of the apparent zenith distance south and the refraction. The upper sign is employed for a direct, and the lower for a reflected observation.

The *eighteenth* column contains:

(1) For stars whose apparent positions are given in the American Ephemeris, the correction to the north-polar distance of the Ephemeris obtained from each observation.

(2) For other stars, the reduction to their mean position for the fictitious epoch 1875.0. This reduction is computed with the constants of the American Ephemeris, and no proper motion is applied.

(3) For the asteroids, the correction for parallax, computed from the data accompanying the ephemerides.

The corrections for parallax, semi-diameter, and defective illumination for the sun, moon, and larger planets are given at the foot of the pages containing the observations.

All corrections for parallax, except those for the asteroids, are computed from the data contained in the American Ephemeris. When both limbs of an object were observed, the semi-diameter is derived from the observation; but, when only one limb was observed, the semi-diameter is taken from the American Ephemeris.

The corrections for defective illumination are computed from the data of the American Ephemeris.

CORRECTIONS TO THE STAR-POSITIONS OF THE AMERICAN EPHEMERIS, GIVEN BY INDIVIDUAL OBSERVATIONS WITH THE TRANSIT CIRCLE IN 1875.

The tables containing these corrections may be found on pages 375 to 396 and give the date of the observation, the initial of the observer, and the correction for each observation in right ascension and north-polar distance, copied without change, except for erroneous micrometer revolutions, from the last column of each page of observations.

The correction in right ascension in the case of clock-stars is only used when it depends on three other clock-stars, or on one or two stars at least six hours distant in right ascension

The correction in right ascension for the standard azimuth stars is given only when the azimuth constant was derived from observed transits of one of the stars above and below the pole on the same day, or from the combined results from the observations of two or more stars. In the latter case the names of the stars so combined follow the correction for each star.

An interrogation-mark signifies that the result is doubtful, and an *r*, that it is rejected in the determination of the adopted mean result.

The mean polar distances thus found still require the following corrections:

(1) For errors of division;
(2) For flexure;
(3) For error in zenith-point correction;
(4) For error in assumed latitude.

Errors of Division.—The corrections for errors of division of circle B were determined in November and December, 1865. These corrections are given in the following table,[1] which contains the corrections to be applied to the mean of the readings of the four microscopes in order to free this mean from the effect of errors of division. The argument with which to enter the table is the reading of the horizontal microscope at circle B.

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[1] See Washington Observations for 1865, Description of Transit Circle, § 72.

TABLE IV.—*Corrections for Errors of Division to be applied to the Mean of the Readings of the Four Micrometer Microscopes of Circle B.*

Arg.	Correction.	Arg.	Correction.	Arg.	Correction.	Arg.	Correction	Arg.	Correction.
°	″	°	″	°	″	°	″	°	″
0	+ 0.30	18	+ 0.57	36	+ 0 12	54	+ 0.14	72	+ 0.27
1	+ 0.23	19	+ 0.52	37	+ 0.15	55	+ 0.15	73	+ 0.28
2	+ 0.18	20	+ 0.48	38	+ 0.14	56	+ 0 16	74	+ 0.31
3	+ 0.18	21	+ 0.49	39	+ 0.08	57	+ 0.17	75	+ 0.35
4	+ 0.22	22	+ 0.52	40	+ 0.02	58	+ 0.19	76	+ 0.40
5	+ 0.27	23	+ 0.53	41	− 0.07	59	+ 0.20	77	+ 0.45
6	+ 0.27	24	+ 0.50	42	− 0.12	60	+ 0.22	78	+ 0.46
7	+ 0.26	25	+ 0.46	43	− 0.13	61	+ 0.26	79	+ 0.45
8	+ 0.26	26	+ 0.44	44	− 0.07	62	+ 0.28	80	+ 0.44
9	+ 0.27	27	+ 0.42	45	− 0.01	63	+ 0.27	81	+ 0.41
10	+ 0.29	28	+ 0.40	46	0.00	64	+ 0.25	82	+ 0.38
11	+ 0.29	29	+ 0.34	7	0.00	65	+ 0.22	83	+ 0.36
12	+ 0.29	30	+ 0.27	48	0.00	66	+ 0.22	84	+ 0.36
13	+ 0.36	31	+ 0.24	49	+ 0.06	67	+ 0.22	85	+ 0.36
14	+ 0.44	32	+ 0.22	50	+ 0.12	68	+ 0.22	86	+ 0.40
15	+ 0.52	33	+ 0.19	51	+ 0.12	69	+ 0.23	87	+ 0.44
16	+ 0.56	34	+ 0.15	52	+ 0.12	70	+ 0.24	88	+ 0.44
17	+ 0.57	35	+ 0.11	53	+ 0.13	71	+ 0.25	89	+ 0.37

The corrections in this table are only applicable when the microscopes are 90° apart, and their supporting arms make an angle of 45° with the vertical.

The following table gives the argument, in all cases, with which to enter Table IV to obtain the division correction which must be applied to an observed north-polar distance. In this table, R_0 is the reading of the horizontal microscope at circle B when the telescope points to the zenith; Δ is the observed north-polar distance of the object, and the last column indicates the use of the sign of the correction in Table IV

The argument will, of course, be brought into the first quadrant.

TABLE V.

Clamp.	Observation.	Argument.	Sign of Correction.
		°	
East	Direct	$R_0 + 51\ 1 - \Delta$	Changed
	Reflected	$R_0 + 38.9 + \Delta$	Same
West	Direct	$R_0 + 38.9 + \Delta$	Same
	Reflected	$R_0 + 51.1 - \Delta$	Changed

Flexure.—The correction to an observed circle reading for flexure of circle is,[1] for circle B, $+0''.84 \sin R - 0''.86 \cos R$, where R is the reading of the horizontal microscope when the telescope is pointed to the object. Changing the expression for the correction for flexure of circle, so that the correction will be a function of the north-polar distance, we have the following table for circle B:

Table VI.

Clamp.	Observation.	Correction.
		″ °
East	Direct	$-1.20 \sin (R_0 + 5.4 - \Delta)$
	Reflection	$+1.20 \sin (R_0 + 83.2 + \Delta)$
West	Direct	$+1.20 \sin (R_0 + 263.2 + \Delta)$
	Reflection	$+1.20 \sin (R_0 + 185.4 - \Delta)$

where the quantities have the same significance as in Table V.

From observations[2] made in 1872 and 1873, the following formulæ were obtained for determining the correction to be applied to an observed north-polar distance for the effect of flexure of telescope and curvature of level for circle B:

Table VII.

Clamp.	Observation.	Correction.
		″ °
East	Direct	$-0.95 \sin (\Delta - 33.3)$
	Reflection	$+1.10 \sin (\Delta - 66.4)$
West	Direct	$-0.95 \sin (\Delta - 68.9)$
	Reflection	$+1.10 \sin (\Delta - 35.8)$

The correction for constant error in the zenith-point is obtained from a comparison of the direct and reflection observations in 1875.

The method of obtaining the value of this correction is shown in Table VIII, where the results of the observations are collected. In this table, the first column contains the names of all the stars observed by reflection in 1875. The second column contains the right ascension to the nearest tenth of an hour. The third column contains the mean values of the north-polar distances given by direct observations; and the fourth column contains the seconds of the mean values obtained from reflection observations. The small subscript figures indicate the number of observations made on each star. The fifth column contains the difference between the direct and reflection observations. The sixth column contains the corrections which must be applied to the quantities in the fifth column on account of the errors of graduation and flexure of telescope and circle. The seventh column contains the sums of the quantities in the fifth and sixth columns.

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[1] Washington Observations, 1865, Description of Transit Circle, § 61.

[2] Introduction to Transit Circle, Washington Observations, 1872, page lxiv.

The eighth column contains the weights of the values of $2\Delta Z$ in the seventh column. The weights are computed by the formula

$$p = \frac{12mn}{2mn + 11\,(m+n)}$$

where p is the weight; m, the number of direct observations, and n the number of reflection observations of each star.

The ninth column contains the products of the quantities in the seventh column by their respective weights, and the final results are:

From observations north of the zenith - - - - - - $\Delta Z = +0''.95$
From observations south of the zenith - - - - - - $\Delta Z = +0''.24$

TABLE VIII.—*Computation of the Value of ΔZ from the Observations in* 1875.

NORTHERN STARS.

Name of Star.	α	Observed N. P. Distance.		D.−R.	Corr. to D.−R.	$2\Delta Z$	p	$2p\Delta Z$
		Direct.	Reflected.					
	h.	° ′ ″	″	″	″	″		″
Polaris, S. P.	1.2	358 38 34.34_{49}	33.06_{2}	+ 1.28	− 0.97	+ 0.31	1.55	+ 0.48
Polaris	1.2	1 21 27.24_{76}	25.59_{1}	+ 1.65	− 1.03	+ 0.62	0.91	+ 0.56
32^2 Camelopardalis . .	12.8	5 54 29.91_{5}	27.24_{2}	+ 2.67	− 0.78	+ 1.89	1.25	+ 2.36
4 Draconis	12.1	11 41 21.88_{2}	19.38_{2}	+ 2.50	− 0.91	+ 1.59	0.92	+ 1.46
γ Cephei	23.6	13 3 56.14_{7}	52.38_{2}	+ 3.76	− 0.89	+ 2.87	1.33	+ 3.82
5 Ursæ Minoris . . .	14.5	13 44 55.50_{7}	53.60_{1}	+ 1.90	− 0.89	+ 1.01	0.82	+ 0.83
226 Cephei	22.5	14 25 4.60_{2}	2.70_{1}	+ 1.90	− 0.91	+ 0.99	0.65	+ 0.64
β Ursæ Minoris . . .	14.9	15 20 3.15_{9}	59.21_{2}	+ 3.94	− 0.94	+ 3.00	1.37	+ 4.11
Groombridge 4163. .	23.8	16 17 8.58_{8}	4.57_{2}	+ 4.01	− 0.96	+ 3.05	1.35	+ 4.12
79 Draconis	21.9	16 53 21.58_{8}	19.03_{2}	+ 2.55	− 0.97	+ 1.58	1.35	+ 2.13
κ Draconis	12.5	19 31 23.02_{5}	19.46_{2}	+ 3.56	− 1.16	+ 2.40	1.25	+ 3.00
λ Draconis	11.4	19 58 46.39_{6}	42.66_{2}	+ 3.73	− 1.19	+ 2.54	1.29	+ 3.28
β Cephei	21.5	19 59 16.50_{7}	15.47_{1}	+ 1.03	− 1.19	− 0.16	0.82	− 0.13
δ Draconis	19.2	22 33 31.31_{9}	26.63_{1}	+ 4.68	− 1.10	+ 3.58	0.84	+ 3.01
ο Cephei	23.2	22 34 21.39_{7}	16.93_{3}	+ 4.46	− 1.10	+ 3.36	1.66	+ 5.58
ι Cassiopeæ	2.3	23 9 42.76_{6}	38.63_{4}	+ 4.13	− 1.06	+ 3.07	1.82	+ 5.59
9 Camelopardalis . .	4.7	23 52 23.95_{4}	22.75_{2}	+ 1.20	− 1.00	+ 0.20	1.17	+ 0.23
ι Cephei	22.8	24 27 25.71_{5}	23.00_{3}	+ 2.71	− 0.98	+ 1.73	1.52	+ 2.63
α Draconis	14.0	25 1 35.33_{6}	33.77_{3}	+ 1.56	− 0.94	+ 0.62	1.60	+ 0.99
α Ursæ Majoris . . .	10.9	27 34 30.19_{8}	27.10_{3}	+ 3.09	− 0.93	+ 2.16	1.70	+ 3.67
α Cephei	21.3	27 56 38.53_{12}	36.03_{4}	+ 2.50	− 0.93	+ 1.57	2.12	+ 3.33
α Cassiopeæ	0.5	34 8 56.72_{13}	53.42_{10}	+ 3.30	− 0.74	+ 2.56	3.04	+ 7.78
θ Bootis	14.3	37 34 15.47_{5}	15.18_{2}	+ 0.29	− 0.51	− 0.22	1.25	− 0.28
η Ursæ Majoris . . .	13.7	40 3 45.67_{19}	42.05_{3}	+ 3.62	− 0.36	+ 3.26	1.92	+ 6.26
ι Ursæ Majoris . . .	8.8	41 28 9.45_{5}	9.47_{1}	− 0.02	− 0.37	− 0.39	0.79	− 0.31
								$\Delta Z = +0''.95$

TABLE VIII.—*Computation of the Value of* ΔZ *from the Observations in* 1875—Cont'd.

SOUTHERN STARS.

Name of Star.	a	Observed N. P. Distance.		D.−R.	Corr. to D.−R.	$2\Delta Z$	p	$2p\Delta Z$
		Direct.	Reflected.					
	h.	° ′ ″	″	″	″	″		″
α Coronæ Borealis	15.5	62 51 48.97$_{26}$	47.51$_{1}$	+ 1.46	− 0.25	+ 1.21	0.89	+ 1.08
ε Leonis	9.6	65 39 5.75$_{7}$	4.04$_{1}$	+ 1.71	− 0.37	+ 1.34	0.82	+ 1.10
δ Leonis	11.1	68 47 31.38$_{18}$	30.56$_{2}$	+ 0.82	− 0.49	+ 0.33	1.48	+ 0.49
β Arietis	1.8	69 48 15.19$_{40}$	13.38$_{1}$	+ 1.81	− 0.49	+ 1.32	0.90	+ 1.19
α Bootis	14.2	70 9 58.32$_{24}$	57.87$_{3}$	+ 0.45	− 0.49	− 0.04	1.96	− 0.08
η Bootis	13.8	70 58 31.27$_{29}$	27.93$_{1}$	+ 3.34	− 0.51	+ 2.83	0.90	+ 2.55
γ Geminorum	6.5	73 29 47.24$_{19}$	48.43$_{1}$	− 1.19	− 0.57	− 1.76	0.88	− 1.55
α Tauri	4.5	73 44 39.33$_{21}$	37.85$_{1}$	+ 1.48	− 0.58	+ 0.90	0.88	+ 0.79
γ Tauri	4.2	74 40 34.74$_{4}$	34.89$_{1}$	− 0.15	− 0.58	− 0.73	0.76	− 0.55
α Pegasi	23.0	75 28 1.81$_{29}$	0.90$_{2}$	+ 0.91	− 0.56	+ 0.35	1.53	+ 0.54
ζ Aquilæ	19.0	76 19 15.94$_{22}$	15.16$_{1}$	+ 0.78	− 0.56	+ 0.22	0.89	+ 0.20
α Leonis	10.0	77 25 23.21$_{14}$	22.80$_{1}$	+ 0.41	− 0.58	− 0.17	0.87	− 0.15
ε Delphini	20.5	79 7 13.75$_{8}$	11.80$_{3}$	+ 1.95	− 0.66	+ 1.29	1.70	+ 2.19
ζ Pegasi	22.6	79 49 14.97$_{16}$	14.27$_{3}$	+ 0.70	− 0.70	0.00	1.89	0.00
α Aquilæ	19.7	81 27 38.75$_{26}$	37.14$_{1}$	+ 1.61	− 0.73	+ 0.88	0.89	+ 0.78
ο Piscium	1.6	81 28 20.37$_{17}$	20.85$_{3}$	− 0.48	− 0.73	− 1.21	1.90	− 2.30
ε Piscium	0.9	82 47 0.94$_{19}$	0.93$_{1}$	+ 0.01	− 0.68	− 0.67	0.88	− 0.59
ω Piscium	23.9	83 49 44.02$_{16}$	44.26$_{1}$	− 0.24	− 0.60	− 0.84	0.88	− 0.74
π Aquarii	22.3	89 15 23.15$_{7}$	21.91$_{4}$	+ 1.24	− 0.35	+ 0.89	1.90	+ 1.69
η Virginis	12.2	89 58 19.67$_{10}$	19.58$_{1}$	+ 0.09	− 0.34	− 0.25	0.85	− 0.21
η Aquarii	22.5	90 45 40.26$_{9}$	39.52$_{6}$	+ 0.74	− 0.38	+ 0.36	2.37	+ 0.85
α Aquarii	22.0	90 55 34.97$_{14}$	34.32$_{3}$	+ 0.65	− 0.39	+ 0.26	1.86	+ 0.48
δ Ophiuchi	16.1	93 22 16.06$_{6}$	15.56$_{1}$	+ 0.50	− 0.32	+ 0.18	0.80	+ 0.14
λ Aquarii	22.8	98 14 39.81$_{8}$	39.76$_{2}$	+ 0.05	− 0.23	− 0.18	1.35	− 0.24
θ Aquarii	22.2	98 24 18.84$_{4}$	15.61$_{2}$	+ 3.23	− 0.26	+ 2.97	1.17	+ 3.47
β Libræ	15.2	98 55 14.11$_{6}$	11.06$_{2}$	+ 3.05	− 0.32	+ 2.73	1.29	+ 3.52
μ Aquarii	20.8	99 27 3.28$_{1}$	0.68$_{1}$	+ 2.60	− 0.36	+ 2.24	0.50	+ 1.12
								$\Delta Z = +0''.24$

The correction for error of assumed latitude is derived from a comparison of the observations of the same stars, both above and below the pole. Table IX exhibits the method of obtaining the value of the correction, $\Delta\varphi$. The sixth column contains the sum of the corrections for the errors of division, flexure, and assumed zenith-point. The other columns will require no explanation.

From this table, it is found that $\Delta\varphi = -0''.53$.

TABLE IX.—*Computation of the value of* $\Delta\varphi$ *from Observations made in* 1875.

Name of Star.	a	Observed North-Polar Distance.				U. + L. -360°	Corr. to U. + L. -360°	$2\Delta\phi$	p	$2p\Delta\phi$
		Culmination.								
		Upper.			Lower.					
	h.	°	′	″	″	″	″	″		″
λ Ursæ Minoris.	19.8	1	4	10.44_{14}	52.35_{6}	+ 2.79	− 3.27	− 0.48	2.60	− 1.25
Polaris.	1.2	1	21	27.24_{76}	34.34_{49}	+ 1.58	− 3.27	− 1.69	5.07	− 8.57
51 Cephei.	6.7	2	45	57.00_{14}	6.06_{12}	+ 3.06	− 3.26	− 0.20	3.24	− 0.65
δ Ursæ Minoris.	18.2	3	23	33.25_{18}	28.74_{21}	+ 1.99	− 3.23	− 1.24	3.83	− 4.75
32^2 Camelopardalis.	12.8	5	54	29.91_{5}	34.74_{7}	+ 4.65	− 3.31	+ 1.34	2.08	+ 2.79
ε Ursæ Minoris.	17.0	7	45	39.05_{10}	23.70_{10}	+ 2.75	− 3.59	− 0.84	2.86	− 2.40
1 Draconis.	9.3	8	7	28.31_{1}	34.59_{6}	+ 2.90	− 3.62	− 0.72	0.80	− 0.58
4 Draconis.	12.1	11	41	21.88_{2}	40.37_{1}	+ 2.25	− 3.62	− 1.37	0.65	− 0.89
ζ Ursæ Minoris.	15.8	11	49	19.02_{2}	40.58_{1}	− 0.40	− 3.62	− 4.02	0.65	− 2.61
γ Cephei.	23.6	13	3	56.14_{7}	6.37_{4}	+ 2.51	− 3.56	− 1.05	1.90	− 2.00
9 Draconis.	10.4	13	38	42.14_{2}	21.11_{3}	+ 3.25	− 3.57	− 0.32	1.08	− 0.35
5 Ursæ Minoris.	14.5	13	44	55.50_{7}	6.59_{9}	+ 2.09	− 3.57	− 1.48	2.50	− 3.70
226 Cephei.	22.5	14	25	4.60_{2}	57.70_{1}	+ 2.30	− 3.59	− 1.29	0.65	− 0.84
50 Draconis.	18.8	14	42	52.71_{1}	9.19_{2}	+ 1.90	− 3.59	− 1.69	0.65	− 1.10
β Ursæ Minoris.	14.9	15	20	3.15_{9}	59.42_{4}	+ 2.57	− 3.62	− 1.05	2.01	− 2.11
21 Cassiopeæ	0.6	15	41	45.44_{4}	17.28_{4}	+ 2.72	− 3.63	− 0.91	1.60	− 1.46
Groombridge 4163	23.8	16	17	8.58_{8}	53.98_{3}	+ 2.56	− 3.64	− 1.08	1.70	− 1.84
79 Draconis.	21.9	16	53	21.58_{8}	40.72_{2}	+ 2.30	− 3.64	− 1.34	1.35	− 1.81
γ^2 Ursæ Minoris.	15.3	17	43	17.88_{9}	44.03_{4}	+ 1.91	− 3.61	− 1.70	2.01	− 3.42
ψ^1 Draconis.	17.7	17	47	27.20_{1}	34.70_{1}	+ 1.90	− 3.61	− 1.71	0.50	− 0.86
Groombridge 3241	20.5	17	53	32.68_{3}	28.32_{1}	+ 1.00	− 3.60	− 2.60	0.72	− 1.87
50 Cassiopeæ	1.9	18	11	7.72_{7}	54.18_{3}	+ 1.90	− 3.60	− 1.70	1.66	− 2.82
κ Draconis.	12.5	19	31	23.02_{5}	39.08_{5}	+ 2.10	− 3.57	− 1.47	1.88	− 2.76
λ Draconis.	11.4	19	58	46.39_{6}	15.55_{8}	+ 1.94	− 3.56	− 1.62	2.31	− 3.74
22 Camelopardalis.	6.1	20	38	26.47_{2}	37.78_{2}	+ 4.25	− 3.50	+ 0.75	0.92	+ 0.69
A Draconis.	16.5	20	57	42.70_{4}	20.13_{2}	+ 2.83	− 3.47	− 0.64	1.17	− 0.75
ω Draconis.	17.6	21	11	48.85_{1}	55.65_{1}	+ 0.50	− 3.45	− 2.95	0.50	− 1.48
Groombridge 2320	16.1	21	51	38.65_{2}	23.40_{2}	+ 2.05	− 3.37	− 1.32	0.92	− 1.21
σ^2 Ursæ Majoris.	9.0	22	21	37.82_{2}	24.76_{8}	+ 2.58	− 3.32	− 0.74	1.35	− 1.00
ι Cassiopeæ	2.3	23	9	42.76_{6}	21.59_{1}	+ 4.35	− 3.23	+ 1.12	0.80	+ 0.90
9 Camelopardalis.	4.7	23	52	23.95_{4}	37.20_{1}	+ 1.15	− 3.18	− 2.03	0.76	− 1.54
32 Ursæ Majoris.	10.1	24	16	7.96_{2}	52.76_{3}	+ 0.72	− 3.17	− 2.45	1.08	− 2.65
ι Cephei.	22.8	24	27	25.71_{5}	37.33_{2}	+ 3.04	− 3.17	− 0.13	1.25	− 0.16
α Draconis.	14.0	25	1	35.33_{6}	26.97_{3}	+ 2.30	− 3.15	− 0.85	1.60	− 1.36
										$\Delta\varphi = -0''.53$

It is not out of place here to remark that the number of reflection observations made in each year since 1868, with the Transit Circle, has been so small, that any attempt to fully discuss the observations, with a view to obtaining a trustworthy correction to the "zenith-point correction" must necessarily fail.

The scarcity of reflection observations is chiefly due to the fact that the apparatus employed in such observations was so defective and awkwardly constructed that its use was always unsatisfactory, while it was practically impossible to observe a southern star directly and by reflection at the same transit. The new apparatus described on page xxv will greatly aid in obtaining a larger number of good observations.

Until a sufficient number of good reflection observations are obtained, the reality of the computed value of ΔZ must be considered questionable.

Collecting the results from all the available data, the total systematic correction to be applied to an observed north-polar distance in 1875 is:

For objects north of the zenith:

Observed directly - - - Div. Corr. $+ 0''.42 \sin (\Delta + 263^\circ.8) - 0''.95 + 0''.53$
Observed by reflection - Div. Corr. $+ 0''.33 \sin (\Delta + 193^\circ.8) + 0''.95 + 0''.53$

For objects south of the zenith:

Observed directly - - - Div. Corr. $+ 0''.42 \sin (\Delta + 263^\circ.8) - 0''.24 + 0''.53$
Observed by reflection - Div. Corr. $+ 0''.33 \sin (\Delta + 193^\circ.8) + 0''.24 + 0''.53$

The numerical values of these expressions are given in Table X with the argument north-polar distance. The *second* column contains the corrections for the errors in the division of circle B. The *third* column contains the sums of the corrections for flexure of circle B, flexure of telescope, effect of gravity on the zenith-distance micrometer, and, in the case of reflection observations, curvature of the surface of the mercury. The *fourth* column contains the sum of the corrections for errors in the assumed latitude and constant error in the zenith-point.

As the computed value of ΔZ is not the same for northern as for southern objects, to avoid an abrupt change at the zenith, the value is gradually changed between 46° and 56° north-polar distance. The *fifth* column contains the sum of all the corrections.

TABLE X.—*Systematic Corrections to be applied to the North-Polar Distances of Objects observed with the Transit Circle in* 1875.

DIRECT OBSERVATIONS.

N. P. D.	Division.	Flexure.	$\delta 2 + \delta\phi$	Total.	N. P. D.	Division.	Flexure.	$\delta 2 + \delta\phi$	Total.
°	"	"	"	"	°	"	"	"	"
0	− 0.26	− 0.42	− 0.42	− 1.10	40	− 0.17	− 0.35	− 0.42	− 0.94
1	.27	.42	.42	1.11	41	.16	.34	.42	.92
2	.27	.42	.42	1.11	42	.15	.34	.42	.91
3	.22	.42	.42	1.06	43	.14	.34	.42	.90
4	.18	.42	.42	1.02	44	.13	.33	.42	.88
5	− 0.18	− 0.42	− 0.42	− 1.02	45	− 0.12	− 0.33	− 0.42	− 0.87
6	.22	.42	.42	1.06	46	.12	.32	.42	.86
7	.29	.42	.42	1.13	47	.12	.32	.35	.79
8	.36	.42	.42	1.20	48	.07	.31	.28	.66
9	.43	.42	.42	1.27	49	− .01	.31	.21	.53
10	− 0.44	− 0.42	− 0.42	− 1.28	50	0.00	− 0.30	− 0.14	− 0.44
11	.40	.42	.42	1.24	51	0.00	.30	− 0.06	.36
12	.36	.42	.42	1.20	52	+ 0.01	.29	+ 0.01	.27
13	.36	.42	.42	1.20	53	.06	.29	.08	.15
14	.36	.42	.42	1.20	54	.12	.28	.15	− 0.01
15	− 0.38	− 0.42	− 0.42	− 1.22	55	+ 0.12	− 0.28	+ 0.22	+ 0.06
16	.41	.41	.42	1.24	56	+ 0.08	.27	.29	.10
17	.44	.41	.42	1.27	57	− 0.01	.26	.29	+ 0.02
18	.45	.41	.42	1.28	58	.07	.26	.29	− 0.04
19	.46	.41	.42	1.29	59	.13	.25	.29	.09
20	− 0.45	− 0.41	− 0.42	− 1.28	60	− 0.15	− 0.25	+ 0.29	− 0.11
21	.40	.41	.42	1.23	61	.12	.24	.29	.07
22	.36	.40	.42	1.18	62	.11	.24	.29	.06
23	.31	.40	.42	1.13	63	.15	.23	.29	.09
24	.28	.40	.42	1.10	64	.19	.22	.29	.12
25	− 0.27	− 0.40	− 0.42	− 1.09	65	− 0.22	− 0.22	+ 0.29	− 0.15
26	.25	.40	.42	1.07	66	.24	.21	.29	.16
27	.24	.39	.42	1.05	67	.27	.20	.29	.18
28	.23	.39	.42	1.04	68	.33	.20	.29	.24
29	.22	.39	.42	1.03	69	.39	.19	.29	.29
30	− 0.22	− 0.38	− 0.42	− 1.02	70	− 0.42	− 0.18	+ 0.29	− 0.31
31	.22	.38	.42	1.02	71	.44	.18	.29	.33
32	.22	.38	.42	1.02	72	.46	.17	.29	.34
33	.25	.37	.42	1.04	73	.50	.16	.29	.37
34	.27	.37	.42	1.06	74	.53	.16	.29	.40
35	− 0.28	− 0.37	− 0.42	− 1.07	75	− 0.52	− 0.15	+ 0.29	− 0.38
36	.26	.36	.42	1.04	76	.49	.14	.29	.34
37	.22	.36	.42	1.00	77	.48	.14	.29	.33
38	.20	.36	.42	0.98	78	.52	.13	.29	.36
39	.19	.35	.42	0.96	79	.56	.12	.29	.39

TABLE X.—*Systematic Corrections, etc.*—Continued.

DIRECT OBSERVATIONS.

N. P. D.	Division.	Flexure.	$\delta 2 + \delta\phi$	Total.	N. P. D.	Division.	Flexure.	$\delta 2 + \delta\phi$	Total.
°	″	″	″	″	°	″	″	″	″
80	− 0.57	− 0.12	+ 0.29	− 0.40	110	− 0.45	+ 0.10	+ 0.29	− 0.06
81	.56	.11	.29	.38	111	.40	.11	.29	0.00
82	.52	.10	.29	.33	112	.36	.12	.29	+ 0.05
83	.45	.09	.29	.25	113	.31	.12	.29	.10
84	.37	.09	.29	.17	114	.28	.13	.29	.14
85	− 0.30	− 0.08	+ 0.29	− 0.09	115	− 0.27	+ 0.14	+ 0.29	+ 0.16
86	.29	.07	.29	.07	116	.25	.14	.29	.18
87	.29	.07	.29	.07	117	.24	.15	.29	.20
88	.27	.06	.29	.04	118	.23	.16	.29	.22
89	.26	.05	.29	.02	119	.22	.16	.29	.23
90	− 0.26	− 0.04	+ 0.29	− 0.01	120	− 0.22	+ 0.17	+ 0.29	+ 0.24
91	.27	.04	.29	.02	121	.22	.18	.29	.25
92	.27	.03	.29	− 0.01	122	.22	.18	.29	.25
93	.22	.02	.29	+ 0.05	123	.25	.19	.29	.23
94	.18	.02	.29	.09	124	.27	.20	.29	.22
95	− 0.18	− 0.01	+ 0.29	+ 0.10	125	− 0.28	+ 0.20	+ 0.29	+ 0.21
96	.22	0.00	.29	.07	126	.26	.21	.29	.24
97	.29	+ 0.01	.29	+ 0.01	127	.22	.22	.29	.29
98	.36	.02	.29	− 0.05	128	.20	.22	.29	.31
99	.43	.02	.29	.12	129	.19	.23	.29	.33
100	− 0.44	+ 0.03	+ 0.29	− 0.12	130	− 0.17	+ 0.24	+ 0.29	+ 0.36
101	.40	.04	.29	.07	131	.16	.24	.29	.37
102	.36	.04	.29	.03	132	.15	.25	.29	.39
103	.36	.05	.29	.02	133	.14	.25	.29	.40
104	.36	.06	.29	.01	134	.13	.26	.29	.42
105	− 0.38	+ 0.07	+ 0.29	− 0.02					
106	.41	.07	.29	.05					
107	.44	.08	.29	.07					
108	.45	.09	.29	.07					
109	.46	.09	.29	.08					

TABLE X.—*Systematic Corrections, etc.*—Continued.

DIRECT OBSERVATIONS.					REFLECTED OBSERVATIONS.				
S. P.					NORTH STARS.				
N. P. D.	Division.	Flexure.	$\delta 2 + \delta\phi$	Total.	N. P. D.	Division.	Flexure.	$\delta 2 + \delta\phi$	Total.
°	"	"	"	"	°	"	"	"	"
325	+ 0.12	− 0.32	− 0.42	− 0.62	0	+ 0.36	− 0.08	+ 1.48	+ 1.76
326	+ 0.08	.32	.42	.66	1	.40	.08	1.48	1.80
327	− 0.01	.33	.42	.76	2	.44	.09	1.48	1.83
328	.07	.33	.42	.82	3	.44	.10	1.48	1.82
329	.13	.34	.42	.89	4	.37	.10	1.48	1.75
330	− 0.15	− 0.34	− 0.42	− 0.91	5	+ 0.31	− 0.11	+ 1.48	+ 1.68
331	.12	.34	.42	.88	6	.24	.11	1.48	1.61
332	.11	.35	.42	.88	7	.18	.12	1.48	1.54
333	.15	.35	.42	.92	8	.18	.12	1.48	1.54
334	.19	.36	.42	.97	9	.22	.13	1.48	1.57
335	− 0.22	− 0.36	− 0.42	− 1.00	10	+ 0.26	− 0.13	+ 1.48	+ 1.61
336	.24	.36	.42	1.02	11	.27	.14	1.48	1.61
337	.27	.37	.42	1.06	12	.26	.14	1.48	1.60
338	.33	.37	.42	1.12	13	.26	.15	1.48	1.59
339	.39	.37	.42	1.18	14	.27	.16	1.48	1.59
340	− 0.42	− 0.38	− 0.42	− 1.22	15	+ 0.29	− 0.16	+ 1.48	+ 1.61
341	.44	.38	.42	1.24	16	.29	.16	1.48	1.61
342	.46	.38	.42	1.26	17	.29	.17	1.48	1.60
343	.50	.39	.42	1.31	18	.35	.18	1.48	1.65
344	.53	.39	.42	1.34	19	.43	.18	1.48	1.73
345	− 0.52	− 0.39	− 0.42	− 1.33	20	+ 0.51	− 0.18	+ 1.48	+ 1.81
346	.49	.40	.42	1.31	21	.56	.19	1.48	1.85
347	.48	.40	.42	1.30	22	.57	.19	1.48	1.86
348	.52	.40	.42	1.34	23	.57	.20	1.48	1.85
349	.56	.40	.42	1.38	24	.52	.20	1.48	1.80
350	− 0.57	− 0.40	− 0.42	− 1.39	25	+ 0.48	− 0.21	+ 1.48	+ 1.75
351	.56	.41	.42	1.39	26	.49	.21	1.48	1.76
352	.52	.41	.42	1.35	27	.52	.22	1.48	1.78
353	.45	.41	.42	1.28	28	.53	.22	1.48	1.79
354	.37	.41	.42	1.20	29	.50	.22	1.48	1.76
355	− 0.30	− 0.41	− 0.42	− 1.13	30	+ 0.46	− 0.23	+ 1.48	+ 1.71
356	.29	.41	.42	1.12	31	.44	.23	1.48	1.69
357	.29	.42	.42	1.13	32	.42	.24	1.48	1.66
358	.27	.42	.42	1.11	33	.40	.24	1.48	1.64
359	.26	.42	.42	1.10	34	.35	.24	1.48	1.59
360	− 0.26	− 0.42	− 0.42	− 1.10	35	+ 0.28	− 0.25	+ 1.48	+ 1.51
					36	.24	.25	1.48	1.47
					37	.22	.26	1.48	1.44
					38	.19	.26	1.48	1.41
					39	.15	.26	1.48	1.37

TABLE X.—*Systematic Corrections, etc.*—Continued.

REFLECTED OBSERVATIONS.

NORTH STARS—Continued.

N. P. D.	Division.	Flexure.	$\delta 2 + \delta \phi$	Total.
°	″	″	″	″
40	+ 0.11	− 0.27	+ 1.48	+ 1.32
41	.12	.27	1.48	1.33
42	.15	.27	1.48	1.36
43	.14	.28	1.48	1.34
44	.09	.28	1.48	1.29

SOUTH STARS.

N. P. D.	Division.	Flexure.	$\delta 2 + \delta \phi$	Total.
57	+ 0.12	− 0.31	+ 0.77	+ 0.58
58	.13	.31	.77	.59
59	.14	.32	.77	.59
60	.15	.32	.77	.60
61	.16	.32	.77	.61
62	+ 0.17	− 0.32	+ 0.77	+ 0.62
63	.19	.32	.77	.64
64	.20	.32	.77	.65
65	.22	.32	.77	.67
66	.26	.32	.77	.71
67	+ 0.28	− 0.33	+ 0.77	+ 0.72
68	.27	.33	.77	.71
69	.25	.33	.77	.69
70	.22	.33	.77	.66
71	.22	.33	.77	.66
72	+ 0.22	− 0.33	+ 0.77	+ 0.66
73	.22	.33	.77	.66
74	.23	.33	.77	.67
75	.24	.33	.77	.68
76	.25	.33	.77	.69

SOUTH STARS—Continued.

N. P. D.	Division.	Flexure.	$\delta 2 + \delta \phi$	Total.
°	″	″	″	″
77	+ 0.27	− 0.33	+ 0.77	+ 0.71
78	.28	.33	.77	.72
79	.31	.33	.77	.75
80	.35	.33	.77	.79
81	.40	.33	.77	.84
82	+ 0.44	− 0.33	+ 0.77	+ 0.88
83	.46	.33	.77	.90
84	.45	.33	.77	.89
85	.44	.33	.77	.88
86	.41	.32	.77	.86
87	+ 0.38	− 0.32	+ 0.77	+ 0.83
88	.36	.32	.77	.81
89	.36	.32	.77	.81
90	.36	.32	.77	.81
91	.40	.32	.77	.85
92	+ 0.44	− 0.32	+ 0.77	+ 0.89
93	.44	.32	.77	.89
94	.38	.31	.77	.84
95	.31	.31	.77	.77
96	.24	.31	.77	.70
97	+ 0.18	− 0.31	+ 0.77	+ 0.64
98	.18	.31	.77	.64
99	.22	.30	.77	.69
100	.26	.30	.77	.73
101	.27	.30	.77	.74

Since the assumed value of the latitude is 38° 53′ 38″ 80, the value given by each year's observations will be $38^\circ\ 53'\ 38''.80 + \Delta\varphi$.

The observed north-polar distances used in computing $\Delta\varphi$ had been corrected for constant error in the zenith-point, and, in order to separate the values of the latitude obtained from direct and reflection observations, those corrections should be removed; hence,

Latitude from direct observations - - $= 38^\circ\ 53'\ 38''.80 + \Delta\varphi + \Delta Z$

Latitude from reflection observations - $= 38^\circ\ 53'\ 38''.80 + \Delta\varphi - \Delta Z$

The following table exhibits the results obtained from 1866 to 1875.

TABLE XI.

Year.	Latitude from Direct Observations.	Latitude from Reflection Observations.	Mean.
	° ′ ″	° ′ ″	″
1866	38 53 38.73	38 53 37.67	38.20
1867	39.16	37.48	38.32
1868	38.69	37.73	38.21
1869	38.62	38.90	38.76
1870	38.71	39.57	39.14
1871 1872	39.11	36.49	37.80
1873	38.91	37.89	38.40
1874	38.31	38.27	38.29
1875	38 53 39.22	38 53 37.32	38.27

POSITIONS AND SEMI-DIAMETERS OF THE SUN, MOON, AND PLANETS, DEDUCED FROM OBSERVATIONS WITH THE TRANSIT CIRCLE IN 1875, AND COMPARED WITH THE TABLES.

The results of the observations are given on pages 483 to 494, and require very little explanation.

When both limbs of an object presenting a fully illuminated disk have been observed, the adopted position of the center is the mean of that of the two limbs given in the eighteenth column on the left-hand page and the seventeenth column on the right-hand page of the observations When only one full limb has been observed, the right ascension of the center is derived from the observed place of the limb by applying the "Time of the semi-diameter passing the meridian" taken from the Ephemeris. The declination of the center is obtained by applying the semi-diameter of the Ephemeris.

If one of the limbs observed was defective, the observed difference of right ascension or declination of limbs is multiplied by the ratio of half this difference to the true semi-diameter, and the observed semi-diameter thus deduced is applied to the observed position of the full limb to obtain that of the center. The factors are determined as follows:

Let

$i =$ the elongation of earth and sun as seen from the planet;
$b = \cos i$;
$\delta, \delta' =$ declinations of planet and sun;
$A =$ difference of right ascensions of planet and sun;
$\theta =$ the angle which the line of cusps makes with the meridian;
$f, f' =$ factors by which the measured diameters in right ascension and declination must be multiplied to obtain true semi-diameters.

To find f, we have

$$\tan\theta = \frac{\cos\delta\tan\delta'}{\sin A} - \frac{\sin\delta}{\tan A}$$

When the planet is gibbous;

$$g = \cos\theta\sqrt{b^2 + \tan^2\theta} = \cos\theta'' \qquad \text{when } \sin\theta'' = \cos\theta\sin i$$
$$g' = \sin\theta\sqrt{b^2 + \cot^2\theta} = \cos\theta' \qquad \text{when } \sin\theta' = \sin\theta\sin i$$

$$f = \frac{1}{1+g} \text{ and } f' = \frac{1}{1+g'}$$

When the illuminated disk is a crescent,

$$g = \cos\theta \qquad f = \frac{1}{1+g}$$

$$g' = \sin\theta \qquad f' = \frac{1}{1+g'}$$

When the center of light of Mercury has been observed, the reduction to the center of the planet is denoted by ε, and its value is obtained from the empirical formulæ

$$n = \frac{(1-b)\,(5-b)}{12}$$

In right ascension, - - - - - - - - ε = semi-diameter × $n\cos\theta$
In north-polar distance, - - - - - - - ε = semi-diameter × $n\sin\theta$

The north-polar distances are also corrected for parallax in altitude, found at the foot of the pages of observations, and for errors of division, flexure, etc., taken from Table X.

A discussion of all the observations of the sun made in 1875 gives the following results:

TABLE XII.—*Corrections to the Semi-diameters of the Sun, given in the American Ephemeris, obtained from the mean of all the measures made by each Observer in 1875.*

Observer.	Sidereal Time of Semi-diameter passing the Meridian.	Vertical Semi-diameter.
	s.	″
Eastman . .	-0.04_{24}	-0.12_{24}
Frisby . . .	.00	-0.81_{22}
Skinner . .	-0.08_{2}	-0.60_{26}
Paul . . .	-0.12_{16}	-0.72

The subscript figures indicate the number of observations on which each value depends.

When only one limb of the sun was observed, the quantity in the last column of the observations is the semi-diameter of the Ephemeris corrected by means of the above table.

The places of the moon at the time of transit at Washington are not given, either in the American Ephemeris or the English Nautical Almanac, but are computed in the following manner: The observed right ascension of the center is reduced to Washington mean time, or, if only the north-polar distance is observed, the mean time of transit of the center is taken directly from the American Ephemeris. Increasing this quantity by $5^h\ 8^m\ 12^s$ gives Greenwich mean time, with which, as an argument, the tabular place is interpolated from the hourly Ephemeris for Greenwich.

The places in the American Ephemeris and in the English Nautical Almanac are respectively those of Peirce's and Hansen's tables.

The observations of the major planets are compared with the data given in the American Ephemeris for the instant of transit at Washington. The places of Venus, according to Le Verrier's tables, are obtained by applying to the positions given in the American Ephemeris for the transit at Washington, the differences between the positions for Greenwich noon, given respectively in that Ephemeris and in the English Nautical Almanac.

The observations of the minor planets Ceres, Pallas, Juno, Vesta, and Astræa are compared with the ephemerides in the Appendix to the English Nautical Almanac, from which the position is interpolated for the difference in longitude. The other minor planets are compared with the ephemerides in the Berliner Jahrbuch.

The observed time of transit converted into Washington mean time and increased by $6^h\ 1^m.8$ gives the Berlin mean time of transit. Subtracting the "aberration time" of the Ephemeris leaves the Berlin mean time at which the light left the planet, and for this instant the position of the planet is interpolated from the Ephemeris in the Jahrbuch and compared with the observed place.

TABLE A.—*Absolute Determinations of the Collimation Constant of the Transit Circle in 1875.*

Date.	M	M'	$M+M'$	$0^s.512 \times M+M'$	c_τ	τ	-0.004τ	c_0
1875.	r.	r.	r.	s.	s.	°	s.	s.
January 7	+ 0.105	− 0.125	− 0.020	− 0.010	− 0.028	34.0	− 0.136	− 0.164
21	.106	.155	.049	− .025	.043	27.0	.108	.151
February 1	+ .101	− .097	+ .004	+ .002	.016	25.0	.100	.116
17	− .132	+ .071	− .061	− .031	− .049	29.0	.116	.165
March 8	− .086	+ 0.130	+ 0.044	+ 0.023	+ 0.005	39.0	.156	.151
18	+ .214	− 0.128	.086	.044	.026	41.5	.166	.140
April 2	+ .120	+ .081	.201	.103	.085	65.0	.260	.175
15	− .160	.309	.149	.076	.058	52.8	.211	.153
29	.168	.263	.095	.049	.031	56.0	.224	.193
May 10	+ .136	.108	.244	.125	.107	69.3	.277	.170
18	− .161	.400	.239	.122	.104	60.0	.240	.136
June 4	.198	.533	.335	.172	.154	73.5	.29	.140
16	− .204	+ .567	.363	.186	.168	75.0	.300	.132
25	+ .450	− .095	.355	.182	.164	90.5	.362	.198
July 3	.143	+ .240	.383	.196	.178	75.4	.302	.124
12	+ .104	.298	.402	.206	.188	73.0	.292	.104
24	− .132	.532	.400	.205	.187	79.5	.318	.131
August 11	.242	.656	.414	.212	.194	79.0	.316	.122
21	.125	.497	.372	.190	.172	73.0	.292	.120
September 2	.260	.567	.307	.157	.139	75.0	.300	.161
9	.111	.383	.272	.139	.121	84.0	.336	.215
16	.239	.529	.290	.148	.130	70.0	.280	.150
23	− .111	+ .291	.180	.092	.074	61.0	.244	.170
30	+ .225	− .058	.167	.086	.068	66.2	.265	.197
October 6	.260	− .062	.198	.101	.083	70.5	.282	.199
14	.102	.000	.102	.052	.034	47.5	.190	.156
23	.098	+ .053	.151	.077	.059	61.0	.244	.185
26	.097	+ .078	.175	.090	.072	68.5	.274	.202
November 4	.089	− .026	.063	.032	.014	42.0	.168	.154
15	.080	+ .056	.136	.070	+ .052	50.5	.202	.150
27	.326	− .305	+ .021	+ .011	− .007	45.0	.180	.187
December 9	.141	.150	− .009	− .005	.023	44.0	.176	.199
16	+ 0.140	− .121	+ 0.020	+ 0.010	− 0.004	41.0	− 0.164	− 0.168

Before December 14 $c_\tau = 0.512\,(M+M') - 0.018$. After December 14 $c_\tau = 0.512\,(M+M') - 0.014$.

Adopted value of c_0 for the year $= -0^s.1598$.

TABLE B.—*Adopted Values of the Collimation, Level and Azimuth Constants of the Transit Circle in* 1875.

Date.	τ	c	b	a	Date.	τ	c	b	a
1875.	°	s.	s.	s.	1875.	°	s.	s.	s.
January 11.0	25.0	− 0.06	− 0.15	− 0.37	March 4.2	32.0	− 0.03	− 0.13	+ 0.27
11.3	26.2	0.06	0.19	0.37	4.4	32.6	0.03	0.13	0.27
14.0	34.0	0.02	0.14	0.52	8.0	38.7	0.00	0.21	0.18
14.3	32.8	0.03	0.11	0.52	8.4	36.2	− 0.02	0.19	0.18
15.0	22.5	0.07	0.18	0.64	10.0	44.5	+ 0.02	0.19	0.16
15.3	21.5	− 0.07	− 0.24	− 0.64	10.4	37.3	− 0.01	− 0.21	+ 0.16
16.3	28.0	0.05	0.26	0.72	11.0	46.0	+ 0.02	0.26	0.08
20.0	24.1	0.06	0.26	0.75	12.0	59.0	0.08	0.36	0.36
22.4	40.7	0.00	0.30	0.77	12.4	52.7	0.05	0.31	0.36
26.9	26.5	0.05	0.25	0.96	13.4	44.3	+ 0.02	0.34	0.25
February 1.0	29.0	− 0.04	− 0.25	− 0.98	16.0	56.0	0.06	− 0.25	+ 0.74
1.4	29.8	0.04	0.23	0.98	16.3	49.5	+ 0.04	0.24	0.74
4.4	21.8	0.07	0.14	0.12	17.0	38.4	− 0.01	0.16	0.56
5.0	24.1	0.06	0.14	0.04	17.3	27.2	0.05	0.18	+ 0.56
5.4	24.9	0.06	0.13	0.04	23.0	33.7	− 0.02	0.13	− 0.12
8.0	18.3	− 0.09	− 0.13	− 0.24	25.0	40.6	0.00	− 0.21	− 0.27
9.4	10.7	0.12	0.05	0.12	27.0	58.6	+ 0.07	0.28	0.06
11.4	30.3	0.04	0.23	0.46	27.4	. .	. .	. .	0.06
12.0	28.0	0.05	0.22	0.34	27.8	38.7	0.00	0.33	0.06
12.4	29.0	0.04	0.23	0.34	31.8	. .	. .	0.41	. .
13.0	34.9	− 0.02	− 0.25	− 0.46	April 5.0	56.6	+ 0.07	− 0.37	− 0.18
13.4	32.6	0.03	0.29	0.46	5.4	53.5	0.05	0.35	0.18
14.4	25.0	0.06	0.28	0.44	7.0	56.2	0.06	0.33	0.28
15.0	28.9	0.04	0.25	0.45	7.4	46.2	0.02	0.31	0.28
15.4	18.2	0.09	0.22	0.45	8.4	51.3	0.05	0.31	0.36
15.9	13.5	− 0.11	− 0.30	− 0.50	14.0	50.2	+ 0.04	− 0.27	− 0.48
16.1	25.5	0.06	0.30	0.50	14.4	48.1	0.03	0.32	0.48
16.4	20.0	0.08	0.25	0.50	20.0	48.9	0.04	0.32	0.80
17.4	31.2	0.04	0.28	0.56	20.4	41.0	0.00	0.31	0.80
18.0	17.8	0.09	0.22	0.51	21.0	44.5	0.02	0.31	0.80
18.3	24.0	− 0.06	− 0.22	− 0.51	21.4	41.0	0.00	− 0.28	− 0.80
22.0	37.7	− 0.01	0.19	0.49	22.0	42.4	+ 0.01	0.26	0.80
22.3	47.0	+ 0.03	0.25	0.49	22.5	41.8	+ 0.01	0.28	0.80
22.8	38.7	0.00	0.24	− 0.49	24.8	38.0	− 0.01	0.28	0.79
26.0	42.8	0.01	0.16	+ 0.64	29.0	58.0	+ 0.07	0.44	0.53
26.4	42.0	+ 0.01	− 0.17	+ 0.64	29.4	54.4	+ 0.06	− 0.42	− 0.53
26.8	37.0	− 0.01	0.17	0.64	30.0	62.8	0.09	0.40	0.42
27.3	35.6	0.02	0.20	0.50	30.4	59.2	0.08	0.41	0.42
27.8	24.1	0.06	0.20	0.50	May 4.4	47.0	0.03	0.39	0.67
28.2	28.5	0.05	0.12	0.42	6.0	64.2	0.10	0.42	0.67

TABLE B.—*Adopted Values of the Collimation Level and Azimuth Constants*—Continued

Date.	τ	c	b	a	Date.	τ	c	b	a
1875.	°	s.	s.	s.	1875.	°	s.	s.	s.
May 7.0	62.2	+ 0.09	− 0.40	− 0.62	June 23.7	73.6	+ 0.13	− 0.28	− 0.53
7.4	56.3	0.07	0.36	0.62	25.0	92.2	0.21	0.27	0.11
10.4	63.2	0.09	0.42	0.32	25.8	77.6	0.15	0.17	− 0.11
11.0	69.0	0.12	0.41	0.38	26.3	83.9	0.18	0.19	+ 0.01
11.4	66.2	0.10	0.41	0.38	27.8	78.0	0.15	0.18	− 0.06
12.4	64.4	+ 0.10	− 0.37	− 0.39	29.0	89.4	+ 0.20	− 0.23	− 0.03
13.0	67.4	0.11	0.36	0.41	29.3	85.5	0.18	0.23	0.03
13.4	58.7	0.07	0.38	0.41	July 1.4	75.5	0.14	0.22	0.80
15.0	71.3	0.13	0.35	0.39	3.4	73.0	0.13	0.22	0.62
17.0	62.6	0.09	0.27	0.60	7.4	78.0	0.15	0.22	0.34
17.4	56.0	+ 0.06	− 0.34	− 0.60	8.0	82.5	+ 0.17	− 0.24	− 0.48
18.4	54.0	0.06	0.33	0.60	8.3	81.8	0.17	0.27	0.48
19.0	60.6	0.08	0.32	0.64	13.4	78.9	0.16	0.22	0.48
19.4	57.8	0.07	0.36	0.64	14.4	77.3	0.15	0.23	0.53
22.0	84.6	0.18	0.45	0.48	16.4	79.6	0.16	0.25	0.58
22.6	66.2	+ 0.10	− 0.30	− 0.48	19.0	75.8	+ 0.14	− 0.21	− 0.64
26.0	82.4	0.17	0.36	0.34	21.7	71.0	0.12	0.24	0.69
26.7	64.9	0.10	0.18	0.34	23.8	73.5	0.13	0.13	0.59
27.0	80.8	0.16	0.30	0.41	25.7	73.2	0.13	0.19	0.76
27.3	72.8	0.13	0.28	0.41	26.0	88.8	0.20	0.24	0.69
27.8	57.0	+ 0.07	− 0.28	− 0.41	26.7	72.8	+ 0.13	− 0.17	− 0.69
28.0	76.2	0.14	0.37	0.48	29.5	73.7	0.13	0.21	0.90
28.4	68.0	0.11	0.27	0.48	30.4	76.5	0.15	0.21	0.66
28.8	66.9	0.11	0.27	0.48	August 5.0	80.3	0.16	0.29	0.79
31.0	73.1	0.13	0.30	0.61	5.4	75.0	0.14	0.24	0.79
31.4	69.0	+ 0.12	− 0.29	− 0.65	6.0	82.9	+ 0.17	− 0.27	− 0.67
June 1.0	73.6	0.13	0.22	0.43	9.0	80.3	0.16	0.24	0.72
4.0	76.7	0.15	0.40	0.70	9.4	72.7	0.13	0.20	0.72
4.4	71.7	0.13	0.39	0.70	10.0	79.5	0.16	0.15	0.85
9.4	62.8	0.09	0.29	0.80	10.4	77.6	0.15	0.18	0.85
11.0	81.5	+ 0.17	− 0.34	− 0.70	13.5	69.9	+ 0.12	− 0.18	− 0.62
11.4	77.5	0.15	0.28	0.70	17.3	75.2	0.14	0.20	0.66
13.4	61.6	0.09	0.26	0.90	19.0	77.4	0.15	0.23	0.68
16.4	68.6	0.11	0.27	0.83	20.0	77.1	0.15	0.20	0.70
17.0	77.5	0.15	0.18	0.88	20.5	69.2	0.12	0.18	0.70
19.0	76.2	+ 0.14	− 0.26	− 0.93	21.4	69.1	+ 0.12	− 0.22	− 0.74
19.4	68.4	0.11	0.28	0.93	25.0	72.2	0.13	0.17	0.94
21.0	84.4	0.18	0.29	0.80	25.5	65.1	0.10	0.21	0.94
23.0	84.1	0.18	0.33	0.62	25.8	64.8	0.10	0.20	0.94
23.3	84.0	0.18	0.44	0.62	26.0	72.5	0.13	0.17	0.90

TABLE B.—*Adopted Values of the Collimation Level and Azimuth Constants*—Continued.

Date.	τ	c	b	a
1875.	°	s.	s.	s.
August 26.5	66.5	+ 0.11	− 0.20	− 0.90
30.0	81.2	0.16	0.26	0.56
30.5	72.5	0.13	0.25	0.56
31.5	74.3	0.14	0.18	0.51
September 1.0	82.6	0.17	0.16	0.50
1.5	71.1	+ 0.12	− 0.15	− 0.50
3.0	87.4	0.19	0.19	0.28
3.5	76.6	0.15	0.25	0.28
4.0	85.5	0.18	0.22	0.28
4.5	73.7	0.14	0.20	0.28
7.0	76.8	+ 0.15	− 0.15	− 0.59
7.4	69.1	0.12	0.07	0.59
8.0	76.9	0.15	0.15	0.73
8.5	70.0	0.12	0.16	0.73
11.0	61.7	0.09	0.17	0.82
11.4	57.5	+ 0.07	− 0.15	- 0.82
14.5	64.8	0.10	0.20	0.90
20.0	60.0	0.08	0.10	1.22
20.4	55.4	0.06	0.14	1.22
21.0	59.3	0.08	0.13	1.30
21.4	54.2	+ 0.06	− 0.19	− 1.30
24.0	63.2	0.09	0.13	1.23
24.4	51.9	0.05	0.14	1.27
25.0	63.2	0.09	0.15	1.27
27.4	58.9	0.08	0.17	1.10
29.3	66.7	+ 0.11	− 0.24	− 1.09
October 2.0	59.5	0.08	0.19	1.13
2.4	53.3	0.05	0.11	1.13
4.5	54.9	0.06	0.14	1.13
5.0	68.8	0.12	0.12	1.18
5.4	62.6	+ 0.09	− 0.13	− 1.18
7.0	61.5	0.09	0.23	0.99
7.4	53.8	0.06	0.08	0.99
8.0	61.3	0.09	0.13	1.03
8.4	61.2	0.09	0.13	1.03
9.0	60.5	+ 0.08	− 0.13	− 1.06
9.3	57.2	0.07	0.08	1.06
9.5	53.4	0.05	0.09	1.06
12.4	43.8	0.02	0.08	1.25
13.0	52.8	0.05	0.03	1.25
1875.	°	s.	s.	s.
October 13.4	44.7	+ 0.02	− 0.08	− 1.25
16.5	44.2	0.02	0.10	1.40
17.6	44.5	0.02	0.15	1.39
19.7	38.8	0.00	0.09	1.23
20.0	54.1	0 06	0.08	1.35
20.4	49.4	+ 0.04	− 0.09	− 1.35
20.6	42.4	0.01	0.08	1.35
21.0	66.0	0.10	0.08	1.20
21.2	62.7	0.09	0.16	1.33
21.4	58.5	0.07	0.16	1.33
21.8	52.0	+ 0.05	− 0.15	− 1.17
22.5	57.2	0.07	0.16	1.27
25.0	67.0	0.11	0.17	1.32
25.5	57.1	0.07	0.15	1.32
26.0	69.5	0.12	0.15	1.20
27.0	59.8	+ 0.08	− 0.10	− 1.17
27.5	46.9	0.03	0.05	1.17
28.0	55.6	0.06	0.13	1.22
28.4	55.5	0.05	0.07	1.22
28.6	51.3	0.05	0.07	1.22
29.0	60.1	+ 0.08	− 0.12	− 1.20
29.4	57.9	0.07	0.11	1.20
31.9	45.0	0.02	0.03	1.27
November 2.0	45.0	+ 0.02	0.08	1.30
2.4	40.3	0.00	0.04	1.30
4.4	41.0	0.00	− 0.05	− 1.37
5.5	35.2	− 0.02	0.00	1.47
6.0	42.9	+ 0.01	0.09	1.33
6.4	43.3	0.01	0.06	1.38
8.4	42.3	0.01	0.11	1.43
9.0	44.1	+ 0.02	− 0.08	− 1.27
10.5	42.8	0.01	0.12	1.61
11.0	49.2	0.04	0.13	1.39
11.4	44.2	0.02	0.11	1.39
12.0	51.0	0.04	0.09	1.38
12.2	56.0	+ 0.06	− 0.10	− 1.38
12.4	49.3	0.04	0.12	1.38
12.6	42.1	0.01	0.12	1.38
13.0	53.3	0.05	0.11	1.38
13.4	55.7	0.06	0.14	1.38

TABLE B.—*Adopted Values of the Collimation Level and Azimuth Constants*—Continued.

Date.	τ	c	b	a	Date.	τ	c	b	a
1875.	°	s.	s.	s.	1875.	°	s.	s.	s.
November 14.7	45.2	+ 0.02	− 0.25	− 1.48	December 13.0	39.7	0.00	− 0.09	− 1.41
15.4	46.2	+ 0.02	0.15	1.36	13.4	34.0	− 0.02	0.09	1.41
17.0	36.6	− 0.01	0.05	1.35	16.0	33.5	0.03	0.04	1.52
17.5	30.9	0.04	0.02	1.35	17.4	20.0	0.08	0.02	1.36
17.9	33.5	− 0.03	. .	1.35	18.0	19.6	0.08	0.02	1.27
19.0	55.3	+ 0.06	− 0.08	− 1.28	18.4	20.9	− 0.08	− 0.01	− 1.27
21.8	33.3	− 0.03	0.05	1.39	18.8	. .	. .	− 0.01	1.27
22.0	37.4	0.01	0.09	1.39	19.5	20.3	0.08	0.00	1.46
22.4	33.9	0.02	0.12	1.39	19.7	. .	0.07	− 0.02	1.46
22.4	40.3	0.00	0.09	1.36	19.9	23.3	0.07	0.00	1.44
27.3	39.4	0.00	− 0.13	− 1.38	20.1	33.0	− 0.03	0.00	− 1.44
29.4	26.7	− 0.05	0.09	1.23	20.5	33.1	0.03	+ 0.01	1.44
30.0	30.1	0.04	0.06	1.50	20.8	25.7	0.06	+ 0.01	1.44
30.5	21.5	0.07	0.00	1.50	21.0	33.0	− 0.03	− 0.03	1.39
December 1.0	30.3	0.04	− 0.06	. .	22.5	47.5	+ 0.03	0.05	1.20
2.0	32.3	− 0.03	− 0.07	− 1.40	22.8	45.9	+ 0.02	0.00	− 1.20
2.4	28.6	0.05	0.09	1.40	23.0	56.9	0.07	− 0.07	0.90
10.5	34.0	0.02	0.14	1.62	23.4	59.1	0.08	− 0.14	− 0.90
12.5	33.4	0.03	. .	1.36	27.0	48.6	+ 0.03	0.00	+ 0.01
12.7	32.9	− 0.03	0.09	1.36	27.5	38.2	− 0.01	+ 0.05	+ 0.01

TABLE C.—*Adopted Corrections to the Positions of the Clock Stars given in the American Ephemeris for the Year* 1875.

	s.		s.		s.
α Andromedæ	+ 0.02	κ Cancri	− 0.01	γ² Sagittarii	+ 0.01
γ Pegasi	.00	α Hydræ	− .03	μ¹ Sagittarii	.00
β Ceti	+ .05	ε Leonis	− .06	η Serpentis	+ .06
ε Piscium	+ .02	μ Leonis	− .01	1 Aquilæ	+ .07
θ¹ Ceti	+ .02	α Leonis	− .04	α Lyræ	+ .02
η Piscium	+ 0.07	γ¹ Leonis	− 0.02	β Lyræ	+ 0.03
ο Piscium	− .03	ρ Leonis	− .07	σ Sagittarii	+ .01
β Arietis	+ .02	*l* Leonis	.00	ζ Aquilæ	+ .08
α Arietis	+ .01	δ Leonis	− .06	*d* Sagittarii	+ .02
ξ¹ Ceti	+ .04	δ Crateris	− .02	δ Aquilæ	+ .05
γ Ceti	0.00	τ Leonis	− 0.02	κ Aquilæ	+ 0.04
α Ceti	+ .02	υ Leonis	− .04	γ Aquilæ	+ .03
ζ Arietis	− .04	β Leonis	− .02	α Aquilæ	+ .04
η Tauri	.00	ο Virginis	− .02	β Aquilæ	+ .03
ζ Persei	− .01	η Virginis	− .02	τ Aquilæ	+ .02
γ¹ Eridani	+ 0.04	β Corvi	− 0.04	α² Capricorni	+ 0.04
γ Tauri	+ .01	12 Canum Venaticorum	.00	π Capricorni	+ .03
ε Tauri	− .01	θ Virginis	− .04	ε Delphini	+ .05
α Tauri	− .02	α Virginis	− .02	α Cygni	+ .02
ι Aurigæ	− .04	ζ Virginis	.00	μ Aquarii	+ .07
11 Orionis	− 0.07	η Bootis	− 0.05	ν Cygni	+ 0.06
β Orionis	.00	α Bootis	.00	61¹ Cygni	− .04
β Tauri	− .02	ε Bootis	− .02	ζ Cygni	+ .01
δ Orionis	− .03	α² Libræ	− .01	1 Pegasi	− .05
α Leporis	− .04	β Libræ	.00	β Aquarii	+ .03
ε Orionis	− 0.01	μ¹ Bootis	− 0.01	ξ Aquarii	+ 0.02
α Columbæ	− .04	α Coronæ Borealis	.00	ε Pegasi	+ .01
α Orionis	− .03	α Serpentis	+ .02	μ Capricorni	+ .03
μ Geminorum	− .04	ε Serpentis	.00	α Aquarii	+ .03
γ Geminorum	− .03	δ Scorpii	+ .01	θ Aquarii	+ .02
α Canis Majoris	− 0.08	β¹ Scorpii	+ 0.03	π Aquarii	+ 0.02
ε Canis Majoris	− .05	δ Ophiuchi	+ .02	η Aquarii	+ .03
δ Canis Majoris	− .05	α Scorpii	− .01	ζ Pegasi	+ .06
δ Geminorum	− .06	ζ Ophiuchi	.00	λ Aquarii	+ .08
α² Geminorum	+ .24	η Herculis	+ .01	α Piscis Australis	+ .04
α Canis Minoris	− 0.16	κ Ophiuchi	+ 0.04	α Pegasi	+ 0.03
β Geminorum	− .03	α¹ Herculis	+ .02	θ Piscium	+ .06
φ Geminorum	− .08	*b* Ophiuchi	+ .03	ι Piscium	.00
15 Argus	− .06	α Ophiuchi	+ .03	ω Piscium	+ .01
ε Hydræ	− .04	μ Herculis	.00		

TABLE D.—*Adopted Corrections and Rates of the Sidereal Clock Kessels No.* 1324 *in the Year* 1875, *used in Computing the Corrections to the Star-Positions of the American Ephemeris.*

Mean Day and Sidereal Hour.	Observer.	Clock Correction from Mean of Observations.	Clock Correction Corrected for Personal Equation.	Apparent Rate between Groups.	Adopted Daily Rate.	Mean Day and Sidereal Hour.	Observer.	Clock Correction from Mean of Observations.	Clock Correction Corrected for Personal Equation.	Apparent Rate between Groups.	Adopted Daily Rate.
1875. d. h.		s.	s.	s.	s.	1875. d. h.		s.	s.	s.	s.
Jan. 11 23.8	E.	−12.40	−12.27	−0.20	+0.23	Mar. 13 7.9	F.	−17.47	−17.41	−0.35	−0.34
14 0.3	Sk.	12.80	12.86	+0.23	0.02	16 5.8	E.	18.56	18.43	0.27	0.31
15 23.6	E.	12.77	12.64	−0.18	+0.02	17 5.6	F.	18.76	18.70	0.94	0.27
16 3.6	F.	12.92	12.85	0.32	−0.25	22 23.7	Sk.	24.12	24.18	0.97	0.96
20 20.1	F.	14.10	14.04	0.19	0.25	25 1.7	F.	26.27	26.20	0.83	0.90
22 4.6	Sk.	14.42	14.48	0.00	−0.10	27 12.7	Sk.	28.17	28.23	0.43	0.63
26 18.6	E.	14.59	14.46	−0 01	0.00	April 5 6.7	E.	32.10	31.97	0.43	0.43
Feb. 1 22.5		14.58	14.51	+0.01	0.00	7 11.5	F.	32.98	32.92	0.27	0.35
4 5.5	E.	14.62	14.49	+0.10	+0.05	8 10.0	Sk.	33.10	33.17	0.57	0.42
5 2.9	F.	14.46	14.40	−0.06	+0.02	14 6.8	F.	36.59	36.53	0.91	0.74
7 19.1	E.	14.70	14.57	0.40	−0.23	20 8.7	Sk.	42.02	42.08	0.93	0.92
9 4.5	F.	15.18	15.12	0.23	0.32	21 10.2	E.	43.20	43.07	0.97	0.95
11 6.3	Sk.	15.55	15.60	−0.15	−0.19	22 14.1	F.	44.27	44.20	0.88	0.92
12 1.0	E.	15.85	15.72	+0.21	+0.03	24 18.6	Sk.	46.06	46.12	0.75	0.82
13 3.9	F.	15.56	15.49	0.25	0.23	29 6.7	E.	49.63	49.50	0.72	0.74
14 5.8	S.	15.32	15.22	0.23	0.24	30 7.2	F.	50.30	50.23	0.64	0.68
15 3.8	Sk.	14.95	15.01	0.32	0.28	May 4 13.1	F.	53.03	52.97	0.88	0.76
16 1.9	E.	14.85	14.72	0.23	0.28	6 4.3	Sk.	54.35	54.41	0.81	0.84
17 6.0	F.	14.52	14.45	0.19	0.21	7 7.2	E.	55.45	55.32	0.50	0.66
18 1.0	S.	14.40	14.30	0.23	0.21	10 11.2	Sk.	56.84	56.90	0.36	0.43
22 2.9	S.	13.47	13.37	0.28	0.25	11 9.5	E.	57.36	57.23	0.40	0.38
26 1.9	S.	12.24	12.14	0.51	0.40	12 12.2	F.	57.74	57.68	0.26	0.33
27 10.5	Sk.	11.61	11.66	0.19	0.35	13 8.8	Sk.	57.84	57.90	0.46	0.36
28 4.5	E.	11.65	11.52	+0.03	0.11	14 1.5	E.	58.80	58.67	0.35	0.40
Mar. 4 5.4	E.	11.53	11.40	−0.66	+0.40	17 10.1	F.	59.56	59 49	0.63	0.49
8 3.0	E.	14.10	13.97	0.78	−0.72	18 14.4	Sk.	60.18	60.23	0.63	0.63
10 6.1	F.	15.72	15.66	0.77	0.78	19 11.0	E.	60 90	60.77	0.55	0.59
11 23.2	Sk.	16.15	16.21	0.68	0.72	22 15.7	Sk.	62.46	62.52	−0.21	0.38
12 4.2	E.	−17.16	−17.03	−0.33	−0.50	26 20.1	Sk.	−63.32	−63.38	0.00	−0.10

TABLE D.—*Adopted Corrections and Rates of the Kessels Sidereal Clock, etc.*—Continued.

Mean Day and Sidereal Hour.	Observer.	Clock Correction from Mean of Observations.	Clock Correction Corrected for Personal Equation.	Apparent Rate between Groups.	Adopted Daily Rate.	Mean Day and Sidereal Hour.	Observer.	Clock Correction from Mean of Observations.	Clock Correction Corrected for Personal Equation.	Apparent Rate between Groups.	Adopted Daily Rate.
1875. d. h.		s.	s.	s.	s.	1875. d. h.		s.	s.	s.	s.
May 27 13.5	E.	−63.51	−63.38		−0.11	July 29 19.5	Sk.	−31.11	−31.17		−0.74
				−0.22						−0.93	
28 11.7	F.	3.64	3.58		0.30	30 17.0	E.	32.18	32.00		0.82
				0.37						0.72	
30 1.8	Sk.	4.48	4.53		0.21	Aug. 5 13.0	E.	36.38	36.20		0.87
				0.05						1.02	
31 11.8	E.	4.68	4.55		0.40	6 9.7	Sk.	37.03	37.08		0.96
				0.74						0.90	
31 2.5	F.	5.07	5.01		0.44	9 15.6	P.	39.98	40.20		0.86
				0.14						0.81	
June 4 10.3	E.	5.60	5.47		0.20	10 14.4	Sk.	40.72	40.77		0.82
				0.25						0.84	
9 15.0	F.	6.82	6.76		0.26	13 0.2	P.	43.60	43.64		0.78
				0.27						0.71	
11 8.8	Sk.	7.17	7.23		0.24	17 17.0	P.	46.21	46.25		0.74
				0.20						0.78	
13 15.0	F.	7.76	7.69		0.24	18 7.6	E.	47.64	47.46		0.76
				0.29						0.75	
16 14.4	E.	8.68	8.55		0.44	20 16.7	P.	48.45	48.49		0.66
				0.58						0.58	
16 5.2	F.	8.98	8.91		0.34	21 21.8	P.	49.15	49.19		0.68
				0.11						0.78	
19 11.7	Sk.	9.10	9.16		0.20	25 21.0	P.	52.26	52.30		0.90
				0.28						1.01	
21 5.9	F.	9.73	9.96		0.22	26 16.0	Sk.	53.05	53.10		0.96
				0.15						0.92	
23 15.7	Sk.	9.91	10.03		0.33	30 16.7	P.	56.81	56.81		0.86
				0.51						0.79	
25 0.4	F.	11.30	11.24		0.56	31 21.0	F.	57.80	57.74		0.64
				0.62						0.48	
26 14.4	F.	11.66	11.60		0.65	Sept. 1 17.5	P.	58.15	58.15		0.54
				0.68						0.61	
27 1.7	Sk,	12.55	12.60		0.76	3 18.3	F.	59.46	59.39		0.58
				0.83						0.55	
29 8.4	F.	13.72	13.66		0.68	4 17.4	P.	59.92	59.92		0.22
				0.54						1.16	
July 1 15.6	Sk.	14.85	14.91		0.66	7 19.0	F.	63.54	63.48		1.90
				0.77						1.48	
3 17.8	F.	16.57	16.51		0.65	8 18.3	P.	64.92	64.92		1.50
				0.53						1.53	
7 17.0	F.	18.69	18.63		0.56	11 14.2	F.	9.32	9.25		1.48
				0.58						1.44	
8 10.1	E.	19.22	19.04		0.62	14 22.5	P.	14.06	14.06		1.36
				0.66						1.29	
13 16.0	F.	22.58	22.52		0.52	20 17.5	P.	21.52	21.52		1.43
				0.37						1.57	
14 16.7	E.	23.07	22.90		0.53	21 15.1	F.	23.00	22.93		1.60
				0.69						1.63	
16 18.6	F.	24.39	24.33		0.72	24 19.9	P.	28.16	28.16		1.82
				0.75						2.01	
19 10.1	F.	26.37	26.31		0.55	24 10.7	F.	29.46	29.39		1.74
				0.35						1.47	
21 1.0	Sk.	27.19	27.24		0.48	27 23.1	F.	33.15	33.09		1.36
				0.60						1.24	
23 1.5	F.	28.52	28.46		0.50	29 19.8	F.	35.45	35.39		1.17
				0.41						1.10	
25 1.7	Sk.	29.24	29.29		0.52	Oct. 2 16.5	E.	38.71	38.54		1.19
				0.63						1.28	
25 6.2	E.	29.59	29.41		0.49	4 2.3	P.	41.62	41.62		1.36
				0.35						1.43	
26 1.8	E.	−29.88	−29.70		−0.44	5 19.2	Sk.	−42.57	−42.62		−1.24
				−0.54						−1.05	

Table D.—*Adopted Corrections and Rates of the Kessels Sidereal Clock, etc.*—Continued.

Mean Day and Sidereal Hour.	Observer.	Clock Correction from Mean of Observations.	Clock Correction Corrected for Personal Equation.	Apparent Rate between Groups.	Adopted Daily Rate.
1875. d. h.		s.	s,	s.	s.
Oct. 7 20.5	F.	−44.84	−44.78		−0.98
				−0.92	
8 15.6	Sk.	45.47	45.52		0.90
				0.89	
9 17.2	P.	46.49	46.46		0.89
12 22.6	F.	0.63	0.56		−2.47
				1.39	
13 19.2	Sk.	1.71	1.75		+0.54
				0.18	
16 2.8	P.	2.37	2.34		−0.12
				0.05	
17 5.9	Sk.	2.34	2.40		−0.08
				−0.11	
19 6.1	F.	2.69	2.62		+0.01
				+0.13	
20 22.3	P.	2.55	2.53		0.01
				−0.10	
21 23.6	Sk.	2.58	2.64		0.00
				+0.11	
22 1.3	P.	2.54	2.51		+0.08
				+0.06	
25 20.9	Sk.	2.31	2.36		−0.04
				−0.14	
25 12.8	E.	2.63	2.45		−0.10
				−0.05	
27 21.4	F.	2.58	2.52		+0.04
				+0.13	
28 21.8	P.	2.41	2.39		+0.06
				−0.02	
29 22.2	Sk.	2.36	2.41		−0.08
				0.14	
31 12.4	F.	2.78	2.76		0.13
				0.13	
Nov. 2 20.5	P.	2.95	2.93		0.23
				0.33	
4 1.5	F.	3.72	3.66		0.24
				0.15	
5 0.0	P.	3.82	3.80		0.24
				0.32	
6 13.1	Sk.	3.99	4.04		0.34
				0.35	
8 1.2	F.	4.91	4.84		0.34
				−0.32	
8 14.2	P.	5.03	5.01		0.16
				+0.00	
10 2.9	Sk.	4.94	5.00		0.15
				−0.30	
11 19.5	E.	5.38	5.20		0.20
				−0.11	
12 21.4	P.	− 5.33	− 5.31		−0.11
				−0.12	
1875. d. h.		s.	s.	s.	s.
Nov. 13 19.0	F.	− 5.49	− 5.43		−0.02
				+0.09	
14 7.0	Sk.	5.24	5.30		0.06
				−0.22	
15 1.6	E.	5.64	5.47		0.17
				0.12	
17 21.9	P.	5.72	5.69		0.18
				0.23	
18 14.4	E.	6.24	6.08		−0.14
				−0.05	
21 11.9	P.	6.24	6.21		+0.15
				+0.35	
22 16.6	Sk.	6.08	6.14		+0.10
				−0.14	
24 0.0	F.	6.54	6.47		−0.07
				0.00	
27 0.8	F.	6.53	6.47		0.00
				+0.01	
29 5.1	P.	6.47	6.44		+0.14
				+0.26	
30 22.7	Sk.	6.19	6.25		+0.03
				−0.20	
Dec. 1 17.4	E.	6.57	6.40		−0.28
				0.36	
2 22.4	F.	6.90	6.84		0.26
				0.16	
10 3.1	Sk.	8.11	8.17		0.20
				0.23	
12 6.9	P.	8.70	8.67		0.22
				0.20	
13 22.9	E.	8.97	8.80		0.12
				0.04	
15 16.0	P.	9.94	9.91		0.16
				0.29	
17 2.9	E.	10.48	10.31		0.51
				0.83	
18 22.3	F.	11.04	10.98		0.65
				0.47	
19 8.0	Sk.	11.58	11.64		0.54
				0.62	
20 3.2	P.	12.16	12.14		0.46
				0.30	
20 17.4	E.	12.49	12.32		−0.24
				−0.18	
22 8.7	F.	12.68	12.62		+0.05
				+0.28	
23 0.1	Sk.	12.38	12.44		0.26
				+0.23	
27 23.2	Sk.	−11.49	11.54		+0.23

TABLE D_1.—*Adopted Corrections and Rates of the Kessels Sidereal Clock, No.* 1324, *in the Year* 1875, *used in Computing the Positions of all Objects Observed except the Stars of the American Ephemeris.*

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.	Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1875.		h.	s.	s.	1875.		h.	s.	s.
January 10.9	E.	18.65	− 12.435	− 0.019	February 14.4	S.	5.60	− 15.337	
11.1	E.	22.26	− 12.503		15.3	Sk.	3.85	− 14.885	0.000
11.2	E.	1.50	− 12.357	+ 0.003	15.5	Sk.	9.05	− 14.885	
11.3	E.	3.80	− 12.350		15.9	E.	20.00	− 14.930	− 0.005
13.9	Sk.	18.77	− 12.830	+ 0.018	16.1	E.	0.05	− 14.950	
14.1	Sk.	21.57	− 12.780		16.2	E.	3.07	− 14.833	+ 0.029
14.2	Sk.	1.97	− 12.820	+ 0.017	16.4	E.	7.07	− 14.717	
14.4	Sk.	5.60	− 12.757		17.3	F.	4.57	− 14.503	− 0.008
14.9	E.	18.77	− 12.877	+ 0.019	17.4	F.	7.53	− 14.527	
15.1	E.	21.10	− 12.833		17.9	S.	19.70	− 14.490	+ 0.016
15.2	E.	1.50	− 12.680	− 0.033	18.3	S.	4.27	− 14.357	
15.3	E.	2.50	− 12.713		21.9	S.	18.77	− 13.580	+ 0.024
19.9	F.	18.77	− 14.107	− 0.001	22.1	S.	0.05	− 13.455	
20.1	F.	22.60	− 14.110		22.2	S.	3.80	− 13.420	+ 0.012
22.3	Sk.	4.60	− 14.425		22.6	S.	13.67	− 13.300	
26.9	E.	18.65	− 14.590		25.9	S.	18.77	− 12.330	+ 0.020
31.9	F.	18.65	− 14.635	+ 0.004	26.1	S.	0.23	− 12.223	
February 1.1	F.	22.50	− 14.620		26.3	S.	4.57	− 12.060	− 0.058
4.3	E.	4.57	− 14.653	+ 0.033	26.4	S.	6.70	− 12.183	+ 0.007
4.4	E.	6.50	− 14.590		26.7	S.	15.80	− 12.123	
4.9	F.	19.70	− 14.570	+ 0.034	27.2	Sk.	3.75	− 11.690	+ 0.038
5.1	F.	0.05	− 14.420		27.4	Sk.	7.07	− 11.563	
5.3	F.	4.73	− 14.470	+ 0.018	27.7	Sk.	16.00	− 11.573	− 0.031
5.4	F.	7.67	− 14.417		27.8	Sk.	17.85	− 11.630	
7.9	E.	19.10	− 14.700		28.2	E.	3.80	− 11.697	+ 0.064
9.3	F.	3.50	− 15.180	− 0.004	28.3	E.	5.27	− 11.603	
9.4	F.	6.05	− 15.190		March 4.3	E.	5.27	− 11.553	+ 0.034
11.3	Sk.	4.45	− 15.560	+ 0.008	4.4	E.	7.45	− 11.480	
11.4	Sk.	7.53	− 15.537		7.9	E.	21.03	− 13.983	− 0.021
11.9	E.	18.77	− 15.813	− 0.002	8.3	E.	5.27	− 14.157	− 0.018
12.5	E.	7.07	− 15.837		8.4	E.	7.53	− 14.197	
13.2	F.	3.53	− 15.520	− 0.021	10.1	F.	1.90	− 15.585	− 0.034
13.4	F.	6.03	− 15.590		10.4	F.	8.70	− 15.817	

TABLE D₁.—*Adopted Corrections and Rates of the Sidereal Clock, etc.*—Continued.

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1875.		h.	s.	s.
March 10.9	Sk.	21.10	– 16.050	– 0.042
11.1	Sk.	1.70	– 16.247	
11.9	E.	21.10	– 16.940	– 0.028
12.4	E.	7.53	– 17.230	
13.3	F.	5.27	– 17.433	– 0.016
13.5	F.	10.20	– 17.510	
16.1	E.	1.80	– 18.450	– 0.027
16.3	E.	7.07	– 18.590	
17.1	F.	1.90	– 18.720	– 0.012
17.3	F.	7.53	– 18.787	
22.9	Sk.	22.20	– 24.060	– 0.040
23.1	Sk.	1.90	– 24.210	
25.1	F.	1.73	– 26.267	
27.1	Sk.	2.45	– 28.015	– 0.019
27.8	Sk.	18.00	– 28.317	
April 4.9	E.	23.45	– 32.060	– 0.002
5.1	E.	3.80	– 32.067	
5.3	E.	9.27	– 32.083	– 0.043
5.5	E.	12.50	– 32.223	
7.4	F.	10.83	– 32.990	+ 0.004
7.5	F.	12.47	– 32.983	
8.4	Sk.	9.97	– 33.110	
14.1	F.	3.80	– 36.547	– 0.014
14.3	F.	9.87	– 36.633	
20.1	Sk.	3.47	– 41.820	– 0.036
20.3	Sk.	9.97	– 42.053	– 0.046
20.5	Sk.	14.70	– 42.270	
21.1	E.	4.37	– 42.947	– 0.042
21.3	E.	9.97	– 43.180	– 0.047
21.5	E.	14.53	– 43.393	
22.4	F.	12.83	– 44.233	– 0.028
22.5	F.	15.63	– 44.313	
24.8	Sk.	18.60	– 46.062	
28.9	E.	0.23	– 49.483	– 0.022
29.4	E.	11.33	– 49.730	
1875.		h.	s.	s.
April 30.1	F.	4.07	– 50.263	– 0.013
30.5	F.	13.65	– 50.390	
May 4.4	F.	11.33	– 53.007	– 0.022
4.5	F.	14.53	– 53.077	
6.1	Sk.	4.33	– 54.353	
6.9	E.	0.23	– 55.300	– 0.027
7.1	E.	5.30	– 55.435	– 0.017
7.4	E.	13.53	– 55.577	
10.2	Sk.	9.05	– 56.860	+ 0.025
10.4	Sk.	11.87	– 56.790	
10.9	E.	1.90	– 57.390	+ 0.002
11.3	E.	9.93	– 57.370	– 0.004
11.5	E.	14.70	– 57.350	
12.4	F.	11.33	– 57.763	+ 0.001
12.5	F.	13.90	– 57.760	
13.1	Sk.	5.27	– 57.857	+ 0.003
13.4	Sk.	13.65	– 57.835	
14.9	E.	1.47	– 58.797	
17.1	F.	5.27	– 59.440	– 0.025
17.4	F.	14.53	– 59.673	
18.9	E.	1.90	– 60.765	– 0.016
19.4	E.	15.33	– 60.977	
22.1	Sk.	6.50	– 62.380	– 0.009
22.6	Sk.	18.77	– 62.493	
26.7	Sk.	21.13	– 63.323	
27.1	E.	6.50	– 63.503	+ 0.007
27.4	E.	13.53	– 63.453	– 0.012
27.8	E.	23.70	– 63.570	
28.1	F.	5.37	– 3.620	– 0.004
28.4	F.	13.53	– 3.650	– 0.017
28.8	F.	0.70	– 3.845	
30.9	Sk.	1.80	– 4.657	
31.1	E.	5.45	– 4.590	– 0.010
31.5	E.	16.50	– 4.700	

TABLE D$_1$.—*Adopted Corrections and Rates of the Sidereal Clock, etc.*—Continued.

Mean Day.		Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.	Mean Day.		Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1875.			h.	s.	s.	1875.			h.	s.	s.
May	31.9	F.	1.70	− 4.955	− 0.144	July	7.5	F.	16.50	− 18.627	− 0.077
June	1.0	F.	3.30	− 5.185			7.5	F.	17.97	− 18.740	
	3.9	E.	2.50	− 5.600	− 0.003		7.9	E.	5.27	− 19.130	− 0.023
	4.1	E.	7.50	− 5.617			8.2	E.	12.50	− 19.293	+ 0.004
	4.3	E.	13.53	− 5.533	− 0.030		8.3	E.	15.60	− 19.280	
	4.5	E.	17.17	− 5.643			13.3	F.	15.65	− 22.570	− 0.025
	9.3	F.	14.20	− 6.807			13.4	F.	16.45	− 22.590	
	10.9	Sk.	3.70	− 7.135	− 0.015		14.4	E.	16.05	− 23.075	+ 0.002
	11.1	Sk.	7.00	− 7.185	0.000		14.4	E.	17.20	− 23.073	
	11.3	Sk.	13.30	− 7.187			16.5	F.	18.77	− 24.400	
	13.3	F.	13.53	− 7.790	+ 0.017		19.1	F.	10.00	− 26.370	
	13.4	F.	16.50	− 7.740			21.7	Sk.	1.03	− 27.187	
	16.3	E.	13.53	− 8.633	− 0.028		23.8	F.	1.70	− 28.523	
	16.4	E.	15.60	− 8.690			25.8	Sk.	1.70	− 29.467	
	16.9	F.	3.80	− 8.983	+ 0.012		25.9	E.	5.40	− 29.580	− 0.027
	17.1	F.	6.93	− 8.947			25.9	E.	6.90	− 29.620	
	18.9	Sk.	4.15	− 9.105	− 0.025		29.5	Sk.	18.90	− 31.180	+ 0.008
	19.1	Sk.	7.55	− 9.190			29.6	Sk.	20.85	− 31.165	
	19.4	Sk.	16.55	− 9.075	+ 0.012		30.4	E.	16.00	− 32.150	− 0.020
	19.5	Sk.	18.65	− 9.050			30.5	E.	18.13	− 32.193	
	20.9	F.	3.80	− 9.790	+ 0.031	August	4.9	E.	6.50	− 36.183	− 0.047
	21.1	F.	7.50	− 9.677			5.1	E.	11.40	− 36.415	
	22.9	Sk.	4.65	− 9.975	+ 0.052		5.3	E.	17.17	− 36.513	− 0.043
	23.1	Sk.	7.55	− 9.825			5.4	E.	19.57	− 36.617	
	23.3	F.	13.53	− 9.830			5.9	Sk.	6.50	− 36.917	− 0.035
	23.7	Sk.	22.80	− 10.100	0.000		6.1	Sk.	12.33	− 37.123	
	23.8	Sk.	0.23	− 10.100			8.9	P.	7.07	− 39.720	− 0.029
	25.8	F.	0.50	− 11.305	− 0.027		9.3	P.	15.37	− 39.963	− 0.031
	26.3	F.	14.53	− 11.680			9.6	P.	22.80	− 40.193	
	27.8	Sk.	1.70	− 12.547			9.9	Sk.	7.60	− 40.590	− 0.020
	28.9	F.	5.30	− 13.675	− 0.005		10.1	Sk.	10.10	− 40.640	− 0.016
	29.1	F.	9.05	− 13.695			10.4	Sk.	18.65	− 40.775	
July	1.4	Sk.	15.55	− 14.85			13.6	P.	22.83	− 43.547	− 0.044
	3.5	F.	17.97	− 16.573			13.7	P.	1.47	− 43.663	

TABLE D₁.—*Adopted Corrections and Rates of the Sidereal Clock, etc.*—Continued.

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.	Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1875.		h.	s.	s.	1875.		h.	s.	s.
August 18.9	E.	7.55	— 47.64		September 11.1	F.	13.30	— 9.263	— 0.056
19.9	P.	7.50	— 48.297	— 0.022	11.4	F.	21.10	— 9.700	
20.4	P.	19.57	— 48.560	+ 0.006	14.3	P.	19.70	— 13.910	— 0.048
20.5	P.	22.80	— 48.540		14.6	P.	1.70	— 14.197	
21.4	P.	18.23	— 49.030	— 0.030	19.9	P.	9.93	— 21.137	— 0.052
21.6	P.	1.80	— 49.260		20.3	P.	19.33	— 21.627	— 0.052
25.3	P.	17.20	— 52.110	— 0.023	20.5	P.	23.60	— 21.850	
25.5	P.	21.03	— 52.200	— 0.054	20.9	F.	10.20	— 22.670	— 0.063
25.8	P.	6.50	— 52.710		21.3	F.	18.77	— 23.210	
25.9	Sk.	7.55	— 52.800	— 0.036	24.1	P.	13.60	— 27.800	— 0.042
26.1	Sk.	12.40	— 52.973		24.3	P.	18.77	— 28.017	— 0.076
26.3	Sk.	16.50	— 53.077	— 0.033	24.6	P.	1.30	— 28.503	
26.5	Sk.	22.83	— 53.283		24.9	F.	9.93	— 29.360	— 0.099
30.1	P.	13.53	— 56.740	— 0.028	25.0	F.	12.03	— 29.567	
30.3	P.	16.90	— 56.833	— 0.019	27.3	F.	19.57	— 32.940	— 0.050
30.5	P.	22.83	— 56.947		27.5	F.	1.80	— 33.253	
31.4	F.	19.23	— 57.777	— 0.014	29.3	F.	19.07	— 35.403	— 0.066
31.5	F.	22.87	— 57.827		29.3	F.	20.53	— 35.500	
September 1.1	P.	13.30	— 58.160	— 0.003	October 1.9	E.	10.43	— 38.443	— 0.048
1.3	P.	18.93	— 58.177		2.1	E.	15.67	— 38.697	
3.0	F.	10.10	— 59.360	— 0.007	2.2	E.	18.23	— 38.787	— 0.039
3.4	F.	21.03	— 59.440	— 0.030	2.5	E.	23.67	— 38.997	
3.6	F.	0.93	— 59.557		4.5	P.	1.30	— 41.567	— 0.056
4.0	P.	9.77	— 59.873	+ 0.003	4.6	P.	3.80	— 41.707	
4.1	P.	13.53	— 59.863		4.9	Sk.	11.40	— 42.235	— 0.043
4.3	P.	18.75	— 59.840	— 0.027	5.2	Sk.	18.07	— 42.523	— 0.035
4.6	P.	1.47	— 60.020		5.5	Sk.	0.95	— 42.765	
7.1	F.	14.00	— 63.185	— 0.049	7.1	F.	15.65	— 44.600	— 0.055
7.3	F.	17.17	— 63.340	— 0.091	7.3	F.	19.73	— 44.823	— 0.038
7.6	F.	0.53	— 63.013		7.5	F.	0.63	— 45.007	
7.9	P.	9.05	— 64.340	— 0.069	7.9	Sk.	11.00	— 45.280	— 0.051
8.1	P.	13.53	— 64.647		8.1	Sk.	14.53	— 45.460	— 0.029
8.3	P.	18.50	— 64.890	— 0.059	8.4	Sk.	21.37	— 45.660	
8.6	P.	1.70	— 65.317						

TABLE D_1.—*Adopted Corrections and Rates of the Sidereal Clock, etc.*—Continued.

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1875.		h.	s.	s.
October 9.1	P.	14.45	− 46.380	− 0.040
9.3	P.	19.57	− 46.583	
12.3	F.	21.03	− 0.483	− 0.103
12.5	F.	0.23	− 0.813	
13.1	Sk.	15.60	− 1.820	+ 0.028
13.4	Sk.	23.70	− 1.590	
16.5	P.	2.75	− 2.370	
17.6	Sk.	5.27	− 3.327	− 0.016
17.7	Sk.	6.93	− 3.353	
19.6	F.	4.60	− 2.670	+ 0.001
19.7	F.	7.63	− 2.640	
20.1	P.	15.47	− 2.540	+ 0.005
20.4	P.	0.17	− 2.500	− 0.011
20.7	P.	7.50	− 2.577	
20.9	Sk.	12.25	− 2.610	− 0.009
21.1	Sk.	15.55	− 2.640	
21.2	F.	19.63	− 2.697	− 0.001
21.4	F.	0.23	− 2.703	
21.6	Sk.	5.07	− 2.517	− 0.022
21.7	Sk.	7.50	− 2.570	
22.4	P.	0.75	− 2.570	+ 0.053
22.5	P.	1.70	− 2.520	
24.9	Sk.	11.70	− 2.470	+ 0.021
25.1	Sk.	16.50	− 2.370	
25.4	Sk.	22.80	− 2.257	− 0.027
25.6	Sk.	3.80	− 2.390	
26.9	F.	12.65	− 2.735	+ 0.033
27.1	F.	17.13	− 2.587	
27.3	F.	21.67	− 2.560	− 0.004
27.6	F.	3.53	− 2.583	
27.9	P.	13.20	− 2.517	+ 0.041
28.1	P.	15.55	− 2.420	
28.4	P.	22.87	− 2.450	+ 0.020
28.6	P.	4.80	− 2.333	

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1875.		h.	s.	s.
October 28.9	Sk.	12.25	− 2.340	− 0.004
29.3	Sk.	22.80	− 2.393	+ 0.022
29.6	Sk.	3.85	− 2.280	
31.9	P.	12.40	− 2.785	
November 1.9	P.	12.50	− 2.977	+ 0.030
2.1	P.	15.60	− 2.883	
2.2	P.	17.80	− 2.977	+ 0.003
2.5	P.	1.50	− 2.953	− 0.006
2.6	P.	4.57	− 2.970	
4.4	F.	1.2	− 3.760	+ 0.117
4.4	F.	1.8	− 3.690	
5.3	P.	21.67	− 3.840	− 0.004
5.6	P.	4.57	− 3.867	
5.9	Sk.	12.77	− 3.887	− 0.026
6.0	Sk.	15.55	− 3.960	
6.2	Sk.	21.50	− 4.030	− 0.025
6.4	Sk.	1.75	− 4.135	
8.3	F.	22.87	− 4.877	− 0.004
8.5	F.	3.80	− 4.897	
8.9	P.	13.30	− 5.023	+ 0.006
9.0	P.	15.55	− 5.010	
10.4	Sk.	1.30	− 4.917	− 0.010
10.5	Sk.	4.57	− 4.950	
10.9	E.	13.53	− 5.383	+ 0.007
11.1	E.	17.47	− 5.357	
11.3	E.	22.80	− 5.437	+ 0.019
11.5	E.	3.80	− 5.330	
11.9	P.	13.83	− 5.380	+ 0.015
12.1	P.	17.93	− 5.320	
12.3	P.	21.37	− 5.350	+ 0.001
12.6	P.	7.07	− 5.343	
12.9	F.	14.23	− 5.447	− 0.011
13.3	F.	22.20	− 5.533	

TABLE D₁.—*Adopted Corrections and Rates of the Sidereal Clock, etc.*—Continued.

Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.	Mean Day.	Observer.	Sidereal Hour.	Clock Correction.	Hourly Rate.
1875.		h.	s.	s.	1875.		h.	s.	s.
November 14.6	Sk.	5.17	− 5.220	0.000	December 12.9	E.	14.87	− 8.947	− 0.009
14.7	Sk.	7.50	− 5.220		13.1	E.	20.73	− 9.000	
15.4	E.	1.35	− 5.655	+ 0.045	13.3	E.	1.97	− 8.957	− 0.001
15.4	E.	1.90	− 5.630		13.5	E.	6.40	− 8.960	
16.9	P.	13.20	− 5.760	+ 0.003	15.9	P.	15.60	− 9.930	− 0.056
17.1	P.	19.47	− 5.740		16.0	P.	16.50	− 9.980	
17.4	P.	1.20	− 5.720	+ 0.009	17.3	E.	1.40	− 10.417	− 0.048
17.7	P.	7.55	− 5.665		17.4	E.	4.17	− 10.550	
18.9	E.	14.45	− 6.245		17.9	F.	15.87	− 10.870	− 0.022
21.8	P.	11.45	− 6.260	+ 0.029	18.1	F.	19.47	− 10.950	
21.8	P.	12.50	− 6.230		18.4	F.	2.50	− 11.195	− 0.014
21.9	Sk.	13.40	− 6.185	+ 0.027	18.7	F.	11.40	− 11.325	
22.1	Sk.	17.95	− 6.065		19.4	Sk.	5.27	− 11.493	− 0.042
24.3	F.	22.90	− 6.510	+ 0.012	19.8	Sk.	13.20	− 11.823	
24.4	F.	1.80	− 6.475		19.9	P.	16.37	− 12.067	+ 0.014
27.3	F.	22.80	− 6.567	+ 0.007	20.1	P.	19.70	− 12.020	
27.4	F.	2.87	− 6.540		20.3	P.	1.57	− 12.120	− 0.015
29.5	P.	4.77	− 6.377	− 0.257	20.8	P.	12.50	− 12.280	
29.5	P.	5.47	− 6.557		20.9	E.	15.73	− 12.467	− 0.009
29.9	Sk.	15.27	− 6.310	+ 0.017	21.1	E.	19.57	− 12.500	
30.4	Sk.	2.50	− 6.120		22.3	F.	1.83	− 12.783	+ 0.012
30.9	E.	14.00	− 6.560	+ 0.001	22.7	F.	10.00	− 12.687	+ 0.037
December 1.1	E.	19.40	− 6.557		22.9	F.	15.47	− 12.483	
1.9	F.	15.55	− 6.880	+ 0.001	23.1	Sk.	19.70	− 12.500	+ 0.020
2.1	F.	19.73	− 6.887		23.4	Sk.	2.50	− 12.367	
2.4	F.	2.43	− 6.887	0.000	26.9	Sk.	17.27	− 11.630	+ 0.042
2.4	F.	3.80	− 6.887		27.1	Sk.	19.57	− 11.537	
10.3	Sk.	1.47	− 8.060	− 0.042	27.3	Sk.	0.70	− 11.390	+ 0.002
10.4	Sk.	4.45	− 8.185		27.6	Sk.	7.60	− 11.375	
12.4	P.	4.57	− 8.657	− 0.014					
12.6	P.	9.87	− 8.743						

TABLE E.—*Observations of the Nadir Point, together with the resulting Zenith-Point Corrections used in reducing the Observations with the Transit Circle in* 1875.

Mean Day and Sidereal Hour.	Observer.	Reading of Circle A.	Mean of two Readings of the four Microscope Micrometers.	Concluded Circle Reading.	Telescope Microm.	Nadir Reading.	Nadir Constant.	Zenith-Point Correction.
1875. d. h.		° '	r. "	° ' "	r.	° ' "	° ' "	° ' "
Jan. 11.0 19.2	E.	179 56	10 1.99	179 55 58.01	34.221	179 59 26.50	179 59 57.90	0 0 31.40
11.3 2.8	E.		5.21	54.79	34.028	26.23		31.67
14.0 20.6	Sk.		9.72	50.28	33.696	26.80		31.10
14.3 3.1	Sk.		0.26	59.74	34.370	25.95		31.95
15.0 20.2	E.		4.76	55.24	33.942	28.01		29.89
15.3 2.9	E.	179 56	10 4.64	179 55 55.36	34.192	179 59 24.29	179 59 57.90	0 0 33.61
16.3 4.5	F.		2.20	57.80	34.318	24 80		33.10
20.0 20.8	F.		1.95	58.05	34.248	26.13		31.77
22.4 6.8	Sk.		2.40	57.60	34.112	27.75		30.15
Feb. 1.0 20.8	F.		0.40	59.60	34.148	29.21		28.69
1.4 6.1	F.	179 56	10 7.48	179 55 52.52	33.947	179 59 25.21	179 59 57.90	0 0 32.69
4.4 5.9	E.		7.90	52.10	34.114	22.22		35.68
5.1 23.8	F.		9.02	50.98	33.985	23.09		34.81
5.4 7.0	F.		5.44	54.56	34.217	23.11		34.79
8.0 21.8	E.		5.96	54.04	34.112	24.19		33.71
11.5 8.4	Sk.	179 56	10 2.66	179 55 57.34	34.258	179 59 25.26	179 59 57.90	0 0 32.64
12.0 22.2	E.		7.31	52.69	33.958	25.21		32.69
12.4 6.5	E.		5.58	54.42	34.056	25.44		32.46
13.1 0.5	F.		6.04	53.96	33.959	26.47		31.43
13.4 6.0	F.		7.10	52.90	34.000	24.77		33.13
15.0 21.0	Sk.	179 56	10 9.48	179 55 50.52	33.940	179 59 23.32	179 59 57.90	0 0 34.58
15.5 7.2	Sk.		0.55	59.45	34.508	23.54		34.36
16.1 0.3	E.		5.98	54.02	34.097	24.40		33.50
16.4 5.0	E.		10 3.94	56.06	34.164	25.43		32.47
21.9 21.5	S.		9 28.84	61.16	34.497	25.42		32.48
22.6 14.2	S.	179 56	10 1.24	179 55 58.76	34.442	179 59 23.87	179 59 57.90	0 0 34.03
26.0 23.8	S.		10.25	49.75	33.906	23.06		34.84
26.4 5.4	S.		11.08	48.92	33.966	21.32		36.58
26.7 16.5	S.		7.58	52.42	34.196	21.29		36.61
27.3 4.2	Sk.		9.62	50.38	34.050	21.49		36.41
27.8 17.4	Sk.	179 56	10 9.88	179 55 50.12	34.162	179 59 19.52	179 59 57.90	0 0 38.38
28.2 4.8	E.		7.45	52.55	34.327	19.42		38.48
ar. 4.4 6.0	E.		9.55	50.45	34.104	20.73		37.17
8.0 23.4	E.		8.00	52.00	34.160	21.43		36.47
8.4 7.2	E.		7.92	52.08	34.162	21.48		36.42
10.0 1.8	F.	179 56	10 10.50	179 55 49.50	34.085	179 59 20.07	179 59 57.90	0 0 37.83
10.4 8.1	F.		7.44	52.56	34.524	16.42		41.48
11.0 22.5	Sk.		12.41	47.59	34.060	18.54		39.36
12.0 0.0	E.		14.75	45.25	33.820	19.88		38.02
12.4 8.1	E.		15.15	44.85	33.908	18.13		39.77

TABLE E.—*Observations of the Nadir Point, etc.*—Continued.

Mean Day and Sidereal Hour.		Observer.	Reading of Circle A.	Mean of two Readings of the four Microscope Micrometers.	Concluded Circle Reading.	Telescope Microm.	Nadir Reading.	Nadir Constant.	Zenith-Point Correction.
1875. d.	h.		° ′	r. ″	° ′ ″	r.	° ′ ″	° ′ ″	° ′ ″
Mar. 13.4	8.8	F.	179 56	10 10.35	179 55 49.65	34.301	179 59 16.91	179 59 57.90	0 0 40.99
16.0	0.6	E.		14.41	45.59	34.075	16.31		41.59
16.3	7.5	E.		12.10	47.90	34.301	15.16		42.74
17.3	8.5	F.		6.50	53.50	34.642	15.55		42.35
23.0	22.3	Sk.		6.25	53.75	34.587	16.64		41.26
25.0	1.5	F.	179 56	10 1.16	179 55 58.84	34.658	179 59 20.64	179 59 57.90	0 0 37.26
27.0	1.4	Sk.		10.28	49.72	34.126	19.67		38.23
27.8	18.6	Sk.		7.85	52.15	34.442	17.26		40.64
Apr. 5.0	0.8	E.		5.10	54.90	34.506	19.02		38.88
5.5	10.8	E.		7.82	52.18	34.384	18.18		39.72
7.0	1.5	F.	179 56	10 13.52	179 55 46.48	33.930	179 59 19.43	179 59 57.90	0 0 38.47
7.5	12.0	F.		10.30	49.70	34.252	17.72		40.18
8.5	13.4	Sk.		12.90	47.10	34.105	17.36		40.54
14.4	11.8	F.		7.18	52.82	34.368	19.06		38.84
20.0	2.5	Sk.		4.66	55.34	34.356	21.77		36.13
22.5	15.3	F.	179 56	10 9.05	179 55 50.95	34.109	179 59 21.15	179 59 57.90	0 0 36.75
29.4	12.9	E.		8.65	51.35	34.270	19.08		38.82
May 4.5	14.5	F.		8.55	51.45	34.310	18.57		39.33
6.0	3.3	Sk.		3.12	56.88	34.384	22.88		35.02
7.0	3.4	E.		7.52	52.48	34.096	22.88		35.02
7.5	14.3	E.	179 56	10 5.98	179 55 54.02	34.485	179 59 18.46	179 59 57.90	0 0 39.44
10.4	13.9	Sk.		13.80	46.20	33.997	18.12		39.78
11.0	2.8	E.		7.00	53.00	34.772	13.05		44.85
11.4	12.6	E.		15.58	44.42	34.176	13.60		44.30
12.5	14.0	F.		15.59	44.41	34.156	13.90		44.00
13.0	3.9	Sk.	179 56	10 19.14	179 55 40.86	33.847	179 59 15.07	179 59 57.90	0 0 42.83
13.5	14.1	Sk.		11.89	48.11	34.393	13.97		43.93
15.0	3.4	E.		16.55	43.45	34.061	14.38		43.52
17.0	4.7	F.		17.15	42.85	33.812	17.60		40.30
17.5	14.4	F.		19.45	40.55	33.804	15.42		42.48
19.0	4.8	E.	179 56	10 11.45	179 55 48.55	34.230	179 59 16.90	179 59 57.90	0 0 41.00
19.4	14.4	E.		14.82	45.18	34.160	14.61		43.29
22.0	4.5	Sk.		21.48	38.52	33.804	13.39		44.51
26.0	4.7	Sk.		18.00	42.00	34.090	12.49		45.41
26.7	20.2	Sk.		12.06	47.94	34.593	10.74		47.16
27.1	6.8	E.	179 56	10 6.29	179 55 53.71	33.872	179 59 27.54	179 59 57.90	0 0 30.36
27.4	12.0	E.		6.30	53.70	33.831	28.16		29.74
28.0	5.3	F.		7.72	52.28	33.492	31.94		25.96
28.5	14.8	F.		11.18	48.82	33.731	24.81		33.09
28.8	0.4	F.		7.80	52.20	33.956	24.75		33.15

Table E.—*Observations of the Nadir Point, etc.*—Continued.

Mean Day and Sidereal Hour.		Observer.	Reading of Circle A.	Mean of two Readings of the four Microscope Micrometers.	Concluded Circle Reading.	Telescope Microm.	Nadir Reading.	Nadir Constant.	Zenith-Point Correction.
1875. d.	h.		° ′	r. ″	° ′ ″	r.	° ′ ″	° ′ ″	° ′ ″
May 31.0		E.	179 56	10 4.30	179 55 55.70	33.990	179 59 27.73	179 59 57.90	0 0 30.17
31.4	14.7	E.		3.38	56.62	34.230	24.97		32.93
June 1.0	5.0	Sk.		5.89	54.11	33.913	27.31		30.59
4.0	5.3	E.		13.15	46.85	33.682	23.58		34.32
4.4	14.4	E.		6.00	54.00	34.118	24.06		33.84
9.5	16.2	F.	179 56	10 11.55	179 55 48.45	33.837	179 59 22.82	179 59 57.90	0 0 35.08
11.0	5.8	Sk.		12.40	47.60	33.680	24.36		33.54
11.4	14.1	Sk.		10.90	49.10	33.888	22.68		35.22
16.4	15.0	E.		8.88	51.12	34.023	22.64		35.26
17.0	6.8	F.		15.50	44.50	33.453	24.74		33.16
19.0	6.3	Sk.	179 56	10 9.52	179 55 50.48	33.861	179 59 24.48	179 59 57.90	0 0 33.42
19.5	17.0	Sk.		10.69	49.31	33.788	24.43		33.47
21.0	7.0	F.		11.85	48.15	33.640	25.53		32.37
23.0	6.5	Sk.		15.50	44.50	33.520	23.73		34.17
23.3	14.1	F.		19.08	40.92	33.428	21.55		36.35
23.8	23.2	Sk.	179 56	10 17.39	179 55 42.61	33.572	179 59 21.04	179 59 57.90	0 0 36.86
25.0	7.0	F.		22.04	37.96	33 202	22.05		35.85
25.8	22.8	F.		21.58	38.42	33.260	21.62		36.28
26.3	14.8	F.		16.42	43.58	33.718	19.76		38.14
27.8	1.5	Sk.		17.45	42.55	33.634	20.02		37.88
29.1	7.8	F.	179 56	10 16.08	179 55 43.92	33.639	179 59 21.32	179 59 57.90	0 0 36.58
July 3.5	18.5	F.		12.85	47.15	33.812	21.90		36.00
7.4	17.9	F.		15.52	44.48	33.816	19.17		38.73
8.0	7.6	E.		19.38	40.62	33.363	22.25		35.65
8.3	15.0	E.		21.12	38.88	33.345	20.78		37.12
13.4	18.0	F.	179 56	10 4.20	179 55 55.80	34.200	179 59 24.61	179 59 57.90	0 0 33.29
14.4	17.5	E.		9.95	50.05	33.885	23.68		34.22
16.4	18.4	F.		8.15	51.85	34.020	23.42		34.48
19.0	9.0	F.		8.60	51.40	33.866	25.32		32.58
21.7	0.8	Sk.		12.05	47.95	33.703	24.36		33.54
23.8	1.6	F.	179 56	10 9.50	179 55 50.50	33.876	179 59 24.26	179 59 57.90	0 0 33.64
25.7	1.5	Sk.		13.36	46.64	33.624	24.27		33.63
26.0	8.7	E.		6.05	53.95	34.016	25.58		32.32
26.7	2.2	E.		10.15	49.85	33.978	22.06		35.84
29.5	20 2	Sk.		17.19	42.81	33.426	23.47		34.43
30.4		E.	179 56	10 10.38	179 55 49.62	33.842	179 59 23.91	179 59 57.90	0 0 33.99
Aug. 5.0	9.4	E.		10.38	49.62	33.709	25.94		31.96
5.4	19.0	E.		12.10	47.90	33.746	23.66		34.24
6.0	9.3	Sk.		11.25	48.75	33.723	24.86		33.04
9.0	9.7	P.		8.35	51.65	33.864	25.60		32.30

TABLE E.—*Observations of the Nadir Point, etc.*—Continued.

Mean Day and Sidereal Hour.		Observer.	Reading of Circle A.	Mean of two Readings of the four Microscope Micrometers.	Concluded. Circle Reading.	Telescope Microm.	Nadir Reading.	Nadir Constant.	Zenith-Point Correction.
1875. d.	h.		° ′	r. ″	° ′ ″	r.	° ′ ″	° ′ ″	° ′ ″
Aug. 9.4	20.3	P.	179 56	10 11.62	179 55 48.38	33.682	179 59 25.11	179 59 57.90	0 0 32.79
10.0	9.7	Sk.		11.09	48.91	33.678	25.71		32.19
10.4	17.9	Sk.		14.39	45.61	33.557	24.27		33.63
13.6	0.3	P.		11.46	48.54	33.758	24.12		33.78
17.3	18.6	P.		9.92	50.08	33.800	25.00		32.90
19.0	10.1	E.	179 56	10 12.78	179 55 47.22	33.610	179 59 25.06	179 59 57.90	0 0 32.84
20.0	10.2	P.		10.55	49.45	33.705	25.83		32.07
20.5	22.5	P.		8.65	51.35	33.956	23.90		34.00
21.4	19.1	P.		7.40	52.60	33.877	26.36		31.54
21.6	0.5	P.		8.10	51.90	33.869	25.77		32.13
25.0	10.5	P.	179 56	10 4.48	179 55 55.52	33.944	179 59 28.25	179 59 57.90	0 0 29.65
25.5	22.3	P.		7.25	52.75	33.917	25.89		32.01
25.8	6.9	P.		7.12	52.88	33.929	25.84		32.06
26.0	10.9	Sk.		7.71	52.29	33.742	28.12		29.78
26.3	23.1	Sk.		6.68	53.32	33.855	27.41		30.49
30.0	11.0	P.	179 56	10 11.05	179 55 48.95	33.776	179 59 24.26	179 59 57.90	0 0 33.64
30.5	21.9	P.		8.85	51.15	33.893	24.66		33.24
31.4	21.0	F.		16.82	43.18	33.413	24.04		33.86
Sept. 1.0	11.6	P.		11.00	49.00	33.782	24.21		33.69
1.5	22.0	P.		9.81	50.19	33.781	25.42		32.48
3.0	12.3	F.	179 56	10 19.60	179 55 40.40	33.128	179 59 25.63	179 59 57.90	0 0 32.27
3.5	22.8	F.		17.30	42.70	33.459	22.85		35.05
4.5	22.8	P.		11.95	48.05	33.825	22.60		35.30
7.1	14.0	F.		14.45	45.55	33.336	27.60		30.30
7.4	19.0	F.		13.70	46.30	33.448	26.62		31.28
8.5	22.3	P.	179 56	10 10.15	179 55 49.85	33.772	179 59 25.22	179 59 57.90	0 0 32.68
11.0	12.2	F.		13.48	46.52	33.335	28.58		29.32
11.4	20.9	F.		13.82	46.18	33.430	26.78		31.12
14.5	22.4	P.		8.15	51.85	33.762	27.37		30.53
20.4	21.8	P.		5.82	54.18	33.906	27.49		30.41
21.3	20.4	F.	179 56	10 8.72	179 55 51.28	33.664	179 59 28.30	179 59 57.90	0 0 29.60
24.0	12.4	P.		3.82	56.18	33.939	28.99		28.91
24.4	22.5	P.		3.58	56.42	34.033	27.79		30.11
27.4	23.6	F.		9.96	50.04	33.663	27.07		30.83
29.3	19.2	F.		8.50	51.50	33.790	26.59		31.31
Oct. 2.0	13.4	E.	179 56	10 6.08	179 55 53.92	33.939	179 59 26.73	179 59 57.90	0 0 31.17
2.4	22.5	E.		8.60	51.40	33.829	25.89		32.01
4.6	2.3	P.		5.48	54.52	33.946	27.22		30.68
5.0	12.4	Sk.		6.39	53.61	33.912	26.82		31.08
5.5	22.9	Sk.		6.60	53.40	33.860	27.42		30.48

TABLE E.—*Observations of the Nadir Point, etc.*—Continued.

Mean Day and Sidereal Hour.			Observer.	Reading of Circle A.	Mean of two Readings of the four Microscope Micrometers.	Concluded Circle Reading.	Telescope Microm.	Nadir Reading.	Nadir Constant.	Zenith-Point Correction.
1875.	d.	h.		° ′	r. ″	° ′ ″	r.	° ′ ″	° ′ ″	° ′ ″
Oct.	7.0	15.4	F.	179 56	10 9.74	179 55 50.26	33.659	179 59 27.35	179 59 57.90	0 0 30.55
	7.4	22.8	F.		8.22	51.78	33.820	26.41		31.49
	8.0	12.1	Sk.		4.46	55.54	33.999	27.43		30.47
	9.0	13.8	P.		6.95	53.05	33.838	27.40		30.50
	9.3	20.9	P.		6.12	53.88	33.925	26.90		31.00
	9.5	1.7	P.	179 56	10 6.15	179 55 53.85	33.876	179 59 27.62	179 59 57.90	0 0 30.28
	12.4	23.2	F.		8.40	51.60	33.828	26.11		31.79
	13.0	13.9	Sk.		2.99	57.01	34.130	26.90		31.00
	13.4	22.5	Sk.		5.42	54.58	33.946	27.28		30.62
	16.5	1.9	P.		4.42	55.58	34.096	25.98		31.92
	17.6	5.9	Sk.	179 56	10 7.05	179 55 52.95	33.912	179 59 26.16	179 59 57.90	0 0 31.74
	19.7	7.4	F.		7.30	52.70	33.932	25.61		32.29
	20.4	21.9	P.		3.50	56.30	34.041	27.74		30.16
	20.7	6.9	P.		5.05	54.95	33.992	26.95		30.95
	21.0	13.4	Sk.		4.82	55.18	33.964	27.61		30.29
	21.2	20.4	F.	179 56	10 4.88	179 55 55.12	33.903	179 59 28.47	179 59 57.90	0 0 29.43
	21.4	0.8	F.		8.32	51.68	33.738	27.57		30.33
	21.8	8.4	Sk.		9.88	50.12	33.635	27.58		30.32
	22.5	2.4	P.		6.70	53.30	33.844	27.56		30.34
	25.0	14.5	Sk.		3.62	56.38	34.003	28.21		29.69
	25.5	4.2	Sk.	179 56	10 11.08	179 55 48.92	33.517	179 59 28.20	179 59 57.90	0 0 29.70
	26.0	14.4	E.		3.08	56.92	34.020	28.49		29.41
	27.0	15.1	F.		10.05	49.95	33.616	27.70		30.20
	27.5	0.3	F.		10.90	49.10	33.661	26.16		31.74
	28.0	14.5	P.		5.92	54.08	33.772	29.45		28.45
	28.1	15.9	P.	179 56	10 7.22	179 55 52.78	33.658	179 59 29.89	179 59 57.90	0 0 28.01
	28.4	0.3	P.		7.48	52.52	33.776	27.83		30.07
	28.6	4.7	P.		6.82	53.18	33.860	27.20		30.70
	29.0	13.5	Sk.		7.42	52.58	33.740	28.44		29.46
	29.0	13.5	Sk.		7.42	52.58	33.740	28.44		29.46
	29.4	0.6	Sk.	179 56	10 7.72	179 55 52.28	33.691	179 59 28.88	179 59 57.90	0 0 29.02
	31.9	13.7	P.		6.10	53.90	33.910	27.14		30.76
Nov.	1.9	12.6	P.		6.38	53.62	33.914	26.80		31.10
	2.3	22.8	P.		6.52	53.48	33.861	27.48		30.42
	2.6	4.7	P.		7.08	52.92	33.966	25.32		32.58
	4.3	2.3	F.	179 56	10 6.60	179 55 53.40	33.977	179 59 26.63	179 59 57.90	0 0 31.27
	5.3	22.5	P.		6.48	53.52	34.006	25.30		32.60
	5.6	5.3	P.		5.98	54.02	34.050	25.13		32.77
	6.0	14.2	Sk.		2.98	57.02	34.062	27.94		29.96
	6.4	23.2	Sk.		4.78	55.22	34.032	26.60		31.30

TABLE E.—*Observations of the Nadir Point, etc.*—Continued.

Mean Day and Sidereal Hour.	Observer.	Reading of Circle A.	Mean of two Readings of the four Microscope Micrometers.	Concluded Circle Reading.	Telescope Microm.	Nadir Reading.	Nadir Constant.	Zenith-Point Correction.
1875. d. h.		° ′	r. ″	° ′ ″	r.	° ′ ″	° ′ ″	° ′ ″
Nov. 8.4 0.5	F.	179 56	10 2.33	179 55 57.68	34.222	179 59 26.15	179 59 57.90	0 0 31.75
8.9 12.7	P.		3.60	56.40	34.195	25.29		32.61
9.0 16.2	P.		7.28	52.72	33.810	27.50		30.40
10.5 5.0	Sk.		4.65	55.35	34.106	25.59		32.31
11.0 14.9	E,		5.22	54.78	34.028	26.22		31.68
11.4 0.4	E.	179 56	10 5.65	179 55 54.35	34.030	179 59 25.76	179 59 57.90	0 0 32.14
12.0 15.6	P.		6.85	53.15	33.974	25.43		32.47
12.2 18.8	P.		3.34	56.66	34.001	28.52		29.38
12.3 23.4	P.		5.42	54.58	33.978	26.79		31.11
12.7 7.5	P.		4.85	55.15	34.093	25.59		32.31
13.3 23.5	F.	179 56	10 5.58	179 55 54.42	33.823	179 59 29.00	179 59 57.90	0 0 28.90
14.8 10.0	Sk.		7.32	52.68	33.767	28.12		29.78
16.9 13.7	P.		9.28	50.72	33.705	27.10		30.80
17.1 18.7	P.		4.85	55.15	33.905	28.47		29.43
17.3 23.6	P.		6.25	53.75	33.900	27.15		30.75
17.7 8.1	P.	179 56	10 6.18	179 55 53.82	33.890	179 59 27.37	179 59 57.90	0 0 30.53
19.0 16.7	E.		5.19	54.81	33.779	30.07		27.83
21.9 13.7	P.		7.64	52.36	33.748	28.09		29.81
22.0 14.9	Sk.		4.15	55.85	33.909	29.11		28.79
24.4 0.8	F.		6.65	53.35	33.811	28.12		29.78
27.3 23.4	F.	179 56	10 7.30	179 55 52.70	33.740	179 59 28.56	179 59 57.90	0 0 29.34
29.5 3.8	P.		5.38	54.62	34.070	25.42		32.48
30.5 4.0	Sk.		4.48	55.52	33.980	27.70		30.20
Dec. 1.1 18.4	E.		3.50	56.50	34.038	27.79		30.11
2.1 18.5	F.		6.85	53.15	33.729	29.17		28.73
2.4 2.2	F.	179 56	10 4.68	179 55 55.32	33.975	179 59 27.58	179 59 57.90	0 0 30.32
9.3	D.		8.84	51.16	33.786	26.31		31.59
10.5 3.1	Sk.		4.44	55.56	34.024	27.07		30.83
12.5 4.1	P.		3.04	56.96	34.167	26.28		31.62
12.7 9.9	P.		2.79	57.21	34.268	24.98		32.92
12.9 16.0	E.	179 56	10 4.54	179 55 55.46	34.150	179 59 25.04	179 59 57.90	0 0 32.86
13.5 4.6	E.		5.60	54.40	34.074	25.13		32.77
15.9 15.1	P.		1.46	58.54	34.407	24.18		33.72
17.5 4.2	E.		1.62	58.38	34.445	23.44		34.46
18.0 18.8	F.		9.70	50.30	33.878	24.03		33.87
18.4 3.4	F.	179 56	10 3.32	179 55 56.68	34.318	179 59 23.68	179 59 57.90	0 0 34.22
18.8 12.2	F.		4.70	55.30	34.192	24.23		33.67
19.5 5.8	Sk.		4.50	55.50	34.211	24.13		33.77
19.8 14.2	Sk.		6.82	53.18	34.077	23.87		34.03
19.9 15.6	P.		0.81	59.19	34.500	23.40		34.50

TABLE E.—*Observations of the Nadir Point, etc.*—Continued.

Mean Day and Sidereal Hour.	Observer.	Reading of Circle A.	Mean of tw Readings of the four Microscope Micrometers.	Concluded Circle Reading.	Telescope Microm.	Nadir Reading.	Nadir Constant.	Zenith-Point Correction.
1875. d. h.		° ′	r. ″	° ′ ″	r.	° ′ ″	° ′ ″	° ′ ″
Dec. 20.1 20.3	P.	179 56	10 0.71	179 55 59.29	34.456	179 59 24.18	179 59 57.90	0 0 33.72
20.2 23.6	P.		9 27.95	56 2.05	34.547	25.56		32.34
20.7 10.9	P.		10 4.58	55 55.42	34.212	24.05		33.85
20.9 16.1	E.		5.88	54.12	34.062	25.04		32.86
22.5 5.7	F.		4.45	55.55	34.123	25.54		32.36
22.8 12.0	F.	179 56	7.52	179 55 52.48	33.962	179 59 24.94	179 59 57.90	0 0 32.96
23.0 17.2	Sk.		9.25	50.75	33.826	25.29		32.61
23.4 3.1	Sk.		9.70	50.30	33.823	24.88		33.02
27.0 18.0	Sk.		15.25	44.75	33.683	21.47		36.43
27.4 4.8	Sk.		8.80	51.20	34.148	20.81		37.09

THE MERIDIAN TRANSIT INSTRUMENT.

During the year this instrument was used for observing stars whose position in declination had been previously determined by the Mural Circle or the Prime Vertical Transit Instrument. The method of observation was that used in previous years.

The transit system consists of five groups or tallies of vertical threads, and in addition to these there are three vertical threads, movable by a micrometer-screw, and two stationary horizontal ones.

With the clamp end of the axis to the east, the tallies are named, in the order of the transit of stars above the pole, A, B, C, D, and E.

The tally over which an object has been observed is shown by the inspection of the intervals between the threads. The individual threads of each tally are designated by the numbers 1, 2, 3, 4, 5, for A, C, and E, and 1, 2, 3, for B and D, respectively. One vertical thread, A_0, is outside of tally A, and another, E_6, is outside of E. These two, with A_5, B_3, C_3, D_1, and E_1, constitute a system over which transits with eye and ear may be conveniently observed.

On the 12th of January, 1871, Mr. Gardner inserted a new set of threads on a plate scored by Mr. William Würdemann.

From a number of observations of Polaris, above and below the pole, the equatorial intervals between each thread and the mean of B_1, B_2, B_3, C_1, C_2, C_3, C_4, C_5, D_1, D_2, and D_3, were found to be as follows, the notation corresponding to clamp east:

Thread.	Interval.	Thread.	Interval.	Thread.	Interval.	Thread.	Interval.	Thread.	Interval.
	s.		s.		s.		s.		s.
A_1	+37.687	.	. .	C_1	+ 3.200	D_1	−15.046	E_1	−30.198
A_2	+35.806	.	. .	C_2	+ 1.665	D_2	−17.571	E_2	−32.702
A_3	+34.151	B_1	+19.064	C_3	+ 0.003	D_3	−19.213	E_3	−34.266
A_4	+32.634	B_2	+17.584	C_4	− 1.651	.	. .	E_4	−35.945
A_5	+29.988	B_3	+15.134	C	− 3.167	.	. .	E_5	−37.880
		A	+ 45.123			$E_6 =$	− 45.282		

Before December 17 the diaphragm was reversed.

The times of transits of all objects more than 5° distant from the pole were recorded by the Howard and Davis chronograph.

INSTRUMENTAL ERRORS.

Aided by a collimating eye-piece, the error of level and collimation were obtained by reversing the instrument over a basin of mercury, and measuring with the micrometer-screw of the eye-piece the distance between the central thread and its image seen in the mercury. If we represent by $2\varDelta$ the distance of the central thread west of its image when the clamp end of the axis is east; by $2\varDelta^1$, the same quantity, when the clamp is west; by p, the excess of the radius of the clamp-pivot divided by the distance between the pivots; and by $-r$ the reduction of the central thread to the mean of the system B_1, B_2, B_3, C_1, C_2, C_3, C_4, C_5, D_1, D_2, D_3, and by a the correction for diurnal aberration $= -0^s.016$ in this latitude, we have:

$$c = \tfrac{1}{2}(\varDelta - \varDelta^1) - p + r + a, \text{ for clamp east.}$$
$$c = -\tfrac{1}{2}(\varDelta - \varDelta^1) + p - r + a, \text{ for clamp west.}$$
$$b = -\tfrac{1}{2}(\varDelta + \varDelta^1) - p, \text{ for clamp east.}$$
$$b = -\tfrac{1}{2}(\varDelta + \varDelta^1) + p, \text{ for clamp west.}$$

The value of p, as determined in 1864, was $p = +0^s.008$; the numerical value of r for the current year is $r = -0^s.003$. All the observations for determining the errors of collimation and their results are given in the subjoined table, in which r, the value of a revolution of the micrometer, is $1^s.5865$. When great changes occur in the value of c between consecutive dates, they have been caused by adjustment with the collimating screw.

Date.	2△.	2△¹.	C. E.	C. W.
1875.	r.	r.	s.	s.
October 9	+ 0.30	+ 0.18	+ 0.009	− 0.041
November 18	+ 0.12	+ 0.90	− 0.351	+ 0.319
December 16	+ 0.14	+ 1.04	− 0.399	+ 0.367
December 29	− 0.32	− 0.42	+ 0.031	− 0.063

Observations made before the 16th of December, when the diaphragm was re versed, are reduced from these readings with a reversed sign of Clamp Reading.

When observations to determine the value of c are tolerably accordant on successive dates, a mean is adopted for the whole period of such accordance; and where the differences are too great to permit inference that they may be due to errors of observation, the changes are assumed to have been uniformly progressive.

The values used in the reductions are stated at the bottom of each page of the printed observations.

The distance which the line of collimation passes from the pole and the point in which the meridian intercepts the equator are used instead of errors of level and azimuth. When the error of collimation is known, the first distance is directly obtained by observations of stars very near the pole, and may be represented by n. The second distance is determined by combining the value of n with the error of the level. Designating the latter by b, the latitude of the observatory by φ, and representing this second distance by m, we obviously have:

$$m = -n \tan.\ \varphi + b \sec.\ \varphi;$$

and the correction applicable to the observed transit of any star, to reduce it to the meridian, will be obtained by the formula:

$$\text{Correction} = m + n \tan.\ \delta + c \sec.\ \delta;$$

in which δ represents the apparent declination of the star.

An approximate clock-error having been first obtained from one or more equatorial stars, the value of n was determined generally by comparing the time of transit of Polaris, δ Ursæ Minoris, λ Ursæ Minoris, or 51 Cephei with the right ascension given in the American Ephemeris and Nautical Almanac for the year 1875.

The value of n, found in this manner, and used in the reduction of the stars, is published in the table at the bottom of the page of the published observations, under the head of corrections, etc.

It will be readily seen that if m is neither large nor subject to great variation, it will be eliminated through the clock-error. It has not been used separately from the clock-error except when the instrument was used for regulating the mean-time clock of the Observatory, and is, therefore, not always published in its usual place.

The clock-error was obtained from the corrected transits of one or more of the standard stars whose mean place for 1875 is given in the American Ephemeris.

The apparent place of these stars for the date was taken from the Ephemeris for 1875.

The clock used in observing was that of Charles Frodsham.

EXPLANATION OF THE PRINTED OBSERVATIONS.

Column 1 contains the date and initial letter of the observer's name, the day commencing at apparent noon.

Column 2 contains the name of the object, or its approximate declination.

The following system of nomenclature was adopted. Stars contained in the Catalogue of the British Association are designated in the order of precedence.

1. By the constellation and Bayer letter there given.
2. By the constellation and Flamsteed number there given.
3. By the number in the catalogue.

Other stars found in published catalogues are designated by the name and number in the catalogue.

Column 3 contains the number for reference.

The following abbreviations occur:

O. Arg. N.—For Oeltzen's Catalogue from Argelander's Northern Zones.

O. Arg. S.—For Oeltzen's Catalogue from Argelander's Southern Zones.

Weisse (2) for Weisse's Catalogue from Bessel's Zones, from 15 to 45 degrees of north declination.

Some anonymous stars, used in the comparisons of the Equatorial, are denominated by a number, followed by the letter W., or the word "Washington."

Columns 4 to 14, inclusive, contain the seconds and tenths of the transits over the several threads, as noted by the observer at the time, or as subsequently read from the chronographic record; but as there are twenty-one threads, over each of which observations were taken at different times, the numbers over the columns may not represent the thread at which a star was observed, and this can only become known by comparing the observation with the equatorial intervals.

Column 15 contains the minutes, seconds, and decimals of a second obtained by taking the mean of the preceding times of transits over the threads observed.

Column 16 contains the sum of the corrections necessary to reduce the numbers of the preceding column to the clock-time at which the object crossed the great circle passing through the pole, and the point in which the line of collimation intersects the equator.

It consists of two parts:

1. For broken observations of stars, from the mean of the threads B_1, B_2, B_3, C_1, C_2, C_3, C_4, C_5, D_1, D_2, D_3, by the formula,

$$R = \text{equatorial interval} \times \sec \delta.$$

Or if the star was so near the pole that the difference between the sine and arc of the reduction was sensible,

$$\text{Sine } R = \sin \text{equatorial interval} \times \sec \delta.$$

2. The correction for collimation and polar azimuth computed by the formula

$$\text{Correction} = n \tan \delta + c \sec \delta,$$

of which the method of obtaining the factors n and c has already been stated.

Column 17 contains the correction for clock-errors, obtained as stated, and brought forward to the instant of observation by the rate.

Column 18 contains the apparent right ascension of the object observed, obtained from the sum of the three columns immediately preceding.

Column 19 contains the corrections applicable to the preceding column to reduce the observations of the stars to their mean places, 1875.0, or the instant when the sun's mean longitude was 280°.

These were computed from "constants for the reduction of fixed stars," given in the American Ephemeris and Nautical Almanac. The corrections include no proper motions except those used in the list of time and azimuth stars.

There will be found at the foot of the page the adopted clock and instrumental corrections, observations of the reflected image of the middle thread, position of the clamp E. or W., and such notes as the observations called for. The several observations of each fixed star reduced to its mean place for 1875.0 are collected in pages 433 to 437.

As a general rule, the results for the fundamental stars are not given when there were less than four observations in the group used for determining clock-errors.

The magnitude of each star, when estimated by the observer at the time of observation, is given in the tables.

The observations and reductions of the year with this instrument were made by Professor M. Yarnall, U. S. N., and the list of mean places found on pages 433 to 437 was made by Professor H. H. Lockwood, U. S. N.

THE MURAL CIRCLE.

During the year 1875, the Mural Circle was employed in observing stars whose right ascensions had been previously determined by the Transit Instrument, and a number of stars above and below the pole from the British Association Catalogue.

MICROMETER AND TRANSIT THREADS.

The diaphragm inserted in February, 1871, was in use during the year. The intervals of the threads were as follows:

Threads.	I.	II.	III.	IV.	1.	2.	V.	4.	5.	VI.	VII.	VIII.	IX.
	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.	s.
Intervals.	+53.3	+40.9	+29.0	+16.0	+3.2	+1.6	0.0	−1.7	−3.3	−16.1	−28.5	−40.5	−52.7

The values of the micrometer-screw were determined from the following observations, the readings being for intervals of five minutes of arc:

1875.	r.	r.	r.
May 3,	21.096	30.686	40.241
May 3,	21.098	30.673	40.234

which gives the value of the revolution 31″.346, but the value of the previous year, $r = 31''.341$, has been used for this year.

NADIR-POINT.

For determinations of the nadir-point, a cap is provided which fits loosely over any of the eye-pieces of the telescope. Just above the eye-lens, the cap has a plate of thin glass, inclined at an angle of 45°. This arrangement has the advantage of enabling the observer to collimate without removing the eye-piece used in observation, and thereby avoids the risk of injury to the threads, and prevents the frequent admission of dust by air-currents, etc.

The mode of observation is as follows: The circle-telescope is so pointed, that when the nadir-divisions of the former are accurately under the zeros of the microscopes, the images of the horizontal threads in the field of the latter may be seen at a small distance from the threads themselves. The micrometer-reading for the true nadir being that which corresponds to the coincidence of each thread, seen directly, with the image of the other seen by reflection, the images were alternately made to measure, on each side of the threads, spaces equal to their distance apart.

As the nadir thus determined always depends upon the same set of divisions of the circle, and is made with the same part of the micrometer-screw, it is uniformly affected with the errors of those divisions and by any inaccuracy peculiar to that portion of the screw.

METHOD OF OBSERVING.

The method of observing was the same as in previous years, and consisted essentially in transferring the subdivisions of the circle from the microscopes to the micrometer eye-piece. The circle was set so that the divisions nearest to the reading for the given declination were as accurately as possible under the zero of the microscopes.

The circle microscopes were read either before or after the observation.

The observations were made by bisecting the objects with the southern horizontal thread, and the observations of the nadir-point were reduced to the southern or the northern wire from the observations of the night.

EXPLANATION OF THE PRINTED OBSERVATIONS.

Columns 1 to 3 and 7 to 12 need no explanation beyond that given in former years. The magnitudes in column 4 are those estimated by the observer at the time of observation. Columns 5 and 6 show the number of micrometer readings, generally three for each star, and the transit threads over which the readings were made. When the number of micrometer readings does not correspond to the number of threads included between the limits given in column 6, it is understood that the observations were made at equal intervals between those limits.

Column 13 contains the mean of the six microscope readings.

Column 14 contains the mean of the observed micrometer readings.

Column 15 contains the adopted "nadir-corrections," expressed in micrometer revolutions. It is formed by subtracting the excess of the micrometer reading above 30 revolutions from the excess of the mean circle reading above 200°, the reading of microscope A when the telescope pointed to the nadir; that excess being first expressed in micrometer revolutions.

Column 16 gives the corrected meridian micrometer reading formed by applying the following corrections to column 14:

1. The nadir-correction.

2. The reduction to the meridian. For observations made on any of the vertical wires the reduction is given by the formula

$$\varDelta m = -\frac{\sin^2 \frac{1}{2} h}{2\, r \sin 1''} \tan \delta$$

h being the equatorial interval in arc of the vertical wire, and r the value of one revolution of the micrometer.

Expressing h in seconds of time, and putting for r its value already given, this expression becomes

$$\varDelta m = -\{5.2405\}\, h^2 \tan \delta$$

the value of which, for different wires, is tabulated on pages XXXII and XXXIII of the introduction to the Washington Observations for 1863.

For stars near the pole, the time having been recorded, this expression becomes

$$\Delta m = -\frac{225 \sin 1''}{4r}(t-a)^2 \sin 2\,\delta$$

t being the true sidereal time of observation and a the right ascension of the star.

3. The correction of unsymmetrical observations for inclination of micrometer-threads to the horizon. This was:

January 5 to April 5 - - - - - - - - - - $i = \quad 0.00000.$
April 6 to May 24 - - - - - - - - - - - $i = +0.00006 \times h$
May 25 to July 17 - - - - - - - - - - $i = +0.00011 \times h$
August 21 to September 21 - - - - - - - $i = +0.00013 \times h$
September 22 to September 28 - - - - - $i = +0.00017 \times h$
September 29 - - - - - - - - - - - - $i = -0.00008 \times h$

i denoting the correction for inclination and h the equatorial interval in seconds of time, used with its proper algebraic sign for any thread.

Columns 18, 19, and 20 contain the reading of the Newman barometer, its attached thermometer, and the external thermometer.

The external thermometer is designated No. 3 in the Appendix to the Washington Observations for 1845, page 54. It is placed outside of the north aperture, several inches beyond the wall, and is read by the help of a sextant telescope attached to the window-frame.

Column 21, entitled "Instrumental Corrections," contains the micrometer equivalent, or the difference between the corrected micrometer reading and 30 revolutions converted into arc. If the former quantity is denoted by m, the values of this column will be given by the formula

$$\text{Corr.} = (30 \text{ rev.} - m)\, r.$$

Column 22 contains the apparent zenith distance, equal to the sum of columns 13 and 21, diminished by 20° if the sum be greater than 20°, or subtracted from 20° if less. In the former case, the result is marked S., as south; in the latter N., as north.

Column 23 contains the correction for refraction corresponding to the apparent zenith distance and the barometer and thermometer readings. This quantity is computed from Bessel's tables, as given in an expanded form in the Appendix to the Washington Observations for 1845. This correction, added to the apparent zenith distance, gives the corrected geocentric zenith distance, which is not printed.

The following correction is applied to the thermometer readings for irregularity in the bore of the tube:

Correction of Thermometer.

Therm. scale.	Correction.	△ log ref.	Therm. scale.	Correction.	△ log ref.
°	°		°	°	
30	− 0.04	+ 0.00004	66	+ 0.20	− 0.00016
32	− .06	+ 5	68	+ .25	− 21
34	− .11	+ 10	70	+ .22	− 18
36	− .08	+ 7	72	+ .12	− 10
38	− .05	+ 4	74	+ .03	− 3
40	− .02	+ 2	76	− .01	+ 1
42	− .01	+ 1	78	− .04	+ 3
44	.00	0	80	− .04	+ 3
46	− .01	+ 1	82	− .01	+ 1
48	− .03	+ 3	84	.00	0
50	− .04	+ 3	86	− .06	+ 5
52	− .03	+ 3	88	− .12	+ 10
54	− .01	+ 1	90	− .14	+ 11
56	− .01	+ 1	92	− .14	+ 11
58	− .03	+ 3	94	− .14	+ 11
60	.00	0	96	− .13	+ 11
62	+ .05	− 4	98	− .12	+ 10
64	+ 0.12	− 0.00010	100	− 0.12	+ 0.00010

Column 24 contains the declination of the star, using the assumed north latitude $+ 38^\circ\ 53'\ 38''.8$.

Column 25 contains the reduction from the apparent declination at date to the mean declination for 1875.0.

It was computed by Bessel's formula with the constants of the American Ephemeris and Nautical Almanac; and in addition to the terms included in that work, it includes also those depending on twice the moon's longitude.

Corrections for proper motions have *not* been applied to any star.

The resulting mean places of the stars are collected in pages 441 to 445 inclusive.

Column 26 contains the initial of the observer's name: Y., Professor M. Yarnall.

The observations were reduced by Professor M. Yarnall and Professor H. H. Lockwood.

THE XXVI-INCH EQUATORIAL.

This instrument, which was made by ALVAN CLARK & SONS, was mounted in November, 1873. It is fully described in Appendix I of the Washington Observations for 1874.

The position of the pole of the instrument has been determined as below:

Position of the Pole of the Instrument.

Date.	η	ξ
	′	′
1873, Dec. 18 .	− 2.05	− 1.10*
1876, Dec. 13 .	+ 0.28	− 1.60
1877, Jan. 9 . .	+ 0.27	− 1.61
1878, Jan. 3 . .	+ 0.47	− 1.34

*After this determination and before the succeeding one, the telescope was partially dismounted.

The *objective* has a clear aperture of 26.00 inches and a focal length of 389 inches; it will show a star of $16^{m}.3$ on ARGELANDER'S scale extended.

The *position-circle* is 8 inches in diameter, and is divided to $0^\circ.2$, and is read by two verniers (I and II) to $0^\circ.01$. It has no sensible errors of division or centering.

The filar micrometer used during 1875 (Micrometer I) has four wires, three being fixed and one movable. The "long-wire" (so called) is parallel to the axis of the screw and is fixed. It is occasionally used to measure the angles of position of the distant satellites of *Saturn*. Of the 3 wires perpendicular to this, wire A is at $64^{\rm rev.}$, wire B^1 at $93^{\rm r}$, wire B^2 at $95^{\rm r}$. One revolution of the screw is $9''.948$; all the revolutions are equal and no periodic error so large as $0''.017$ in a quarter revolution has been found.

Most of the measures executed with this Micrometer have been made with bright wires and a dark field.

There are four negative eye-pieces, as below:

Negative Eye-pieces.

Designation.	Magnifying power.	Field of view.	Makers.
	Diam.	′	
$\mathbf{A}_{\rm I}$	155*	25.2	Clark & Sons.
$\mathbf{A}_{\rm II}$	439*	10.5	Do.
$\mathbf{A}_{\rm III}$	863*	3.5	Do.
$\mathbf{A}_{\rm IIII}$	1,360*	2.5	Do.

*Approximate.

The positive eye-pieces are as below:

Positive Eye-pieces.

Designation.	Magnifying power.	Field of view.	Makers.	Remarks.
	Diameters.	'		
1	173	13.2	Clark & Sons	
2	284	8.1	Kahler	
3	392	9.9	Clark & Sons	
3 A	400*	6.6	Kahler	Achromatic.
4	636	3.5	Clark & Sons	
5 A	606	4.2	Kahler	Achromatic.
6 A	888	2.3	Steinheil	Do.
7 C	761	3.2	Kahler	Crown-glass.
8 F	875	3.2	Kahler	Flint-glass.
9	1103	2.6	Kahler	
10	1282	2.1	Kahler	
11	1802	1.6	Kahler	
I	390	4.9	Kahler	Single lens.
II	585	3.2	Kahler	Do.
III	780	2.6	Kahler	Do.
IV	1560	1.8	Kahler	Do.

* Approximate.

Eye-pieces 3 A, 5 A, and 6 A, are those commonly used, and they are referred to in the observing-books as 400 A, 600 A, and 800 A.

The observations in detail are printed in pages 283 to 356. These are copied exactly from the observing-books, except that the mean of the times has been corrected for chronometer-error. In the column "Weight," 5 denotes perfect steadiness of images, 1 extremely unsteady images. The transparency of the air, if referred to at all, is described in words. In the column "Observer," N. stands for Professor Newcomb, H. for Professor Hall, Hn. for Professor Holden.

Beside the printed observations an unpublished series has been made on the nebula of *Orion*.

The "Results of Observations" are given in pages 356 to 366, and require no explanation.

OBSERVATIONS

WITH THE

TRANSIT CIRCLE.

1875.

SUMMARY OF THE PRINCIPAL CONSTANTS USED IN REDUCING OBSERVATIONS MADE WITH THE TRANSIT CIRCLE IN 1875.

Approximate equatorial interval between any two consecutive threads from I to VII	$12\frac{1}{4}^{s}$
One revolution of microscope micrometers	30″
One revolution of the zenith-distance micrometer	15″.312

Corrections for Inclinations and Distances of the Declination Threads.

	Before December 14.			After December 14.		
Vertical Thread.	Inclination of Central Threads.	Correction for Thread A.	Correction for Thread B.	Inclination of Central Threads.	Correction for Thread A.	Correction for Thread B.
	″	′ ″	′ ″	″	′ ″	′ ″
I	− 0.40	+ 2 32.56	− 2 33.41	+ 1.46	+ 2 33.79	− 2 32.38
II	0.26	32.67	33.22	0.97	33.25	32.90
III	− 0.13	32.79	33.04	+ 0.49	32.71	33.41
IV	0.00	32.90	32.85	0.00	32.17	33.93
V	+ 0.13	33.01	32.67	− 0.49	31.63	34.45
VI	0.26	33.13	32.48	0.97	31.09	34.96
VII	+ 0.40	+ 2 33.24	− 2 32.30	− 1.46	+ 2 30.55	− 2 35.48

Constant { Added to reduction to meridian Subtracted from zenith-point correction }	1″.80
Adopted latitude of the Transit Circle	+ 38° 53′ 38″.80
One division of the hanging level	$0^{s}.058$
Position of the instrument	Clamp east.

Circle B, on the west end of the axis, was this year used in observing; the reading of its horizontal microscope being 46° 0′ when the telescope was pointed to the zenith.

In reversing the instrument, the notation of the transit threads is also reversed, so that the first thread reached by an equatorial star is always called thread I.

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan's Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Jan. 10	1	α Lyræ	E.	37.4	40.7	42.7	50.6	53.1	55.6	3.6	5.5	8.9	32 53.12	− 0.27	−12.37	−12.43	18 32 40.42	− 0.04
	2	β Lyræ	E.	. .	. .	. .	. .	. .	43.7	48.6	50.5	53.6	45 38.86	− 0.29	−12.50	−12.43	18 45 26.14	+ 0.10
11	3	Sun I, S. . . .	E.	16.4	19.0	20.8	27.3	29.4	31.5	38.5	39.9	42.7	30 29.50	− 0.49	. .	−12.45	19 30 16.56	. .
	4	Sun II, N. . . .	E.	37.0	39.8	41.3	48.0	50.2	52.4	58.9	0.6	3.3	32 50.17	− 0.49	. .	−12.45	19 32 37.23	. .
	5	α Cygni	E.	3.4	7.0	9.4	17.7	20.5	23.4	31.9	34.0	37.7	37 20.56	− 0.24	−12.35	−12.41	20 37 7.91	− 0.04
	6	ζ Cygni	E.	33.8	36.7	38.5	45.5	48.0	50.2	57.4	59.0	2.1	7 47.91	− 0.31	−12.42	−12.41	21 7 35.19	+ 0.02
	7	α Cephei	E.	18.6	24.0	27.3	40.3	44.7	49.2	2.2	5.4	11.0	15 44.74	− 0.11	. .	−12.40	21 15 32.23	− 0.09
	8	ε Pegasi	E.	1.8	4.2	5.8	12.1	14.2	16.3	22.5	24.0	26.7	38 14.18	− 0.38	−12.40	−12.40	21 38 1.40	+ 0.01
	9	α Aquarii. . . .	E.	21.2	23.7	25.2	31.2	33.3	35.5	41.6	43.1	45.7	59 33.39	− 0.41	−12.43	−12.40	21 59 20.58	+ 0.06
	10	α Piscis Australis .	E.	42.5	45.4	47.2	54.4	56.6	59.0	6.0	7.9	11.0	50 56.67	− 0.53	−12.62	−12.39	22 50 43.75	+ 0.27
	11	α Pegasi	E.	31.0	33.7	35.4	41.7	43.8	45.9	52.2	53.7	56.6	58 43.78	− 0.36	−12.40	−12.39	22 58 31.03	+ 0.10
	12	Moon S. . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	13	Polaris	E.	. .	. .	48.5	13.0	41.5	9.0	35.5	. .	. .	12 41.40	+ 4.23	. .	−12.37	1 12 33.26	− 1.88
	14	θ¹ Ceti.	E.	46.9	49.5	51.0	57.1	59.2	1.3	7.5	9.0	11.6	17 59.23	− 0.47	−12.37	−12.37	1 17 46.39	+ 0.02
	15	η Piscium . . .	E.	47.6	50.1	51.8	58.0	0.2	2.3	8.7	10.1	12.8	25 0.18	− 0.40	−12.33	−12.37	1 24 47.41	+ 0.03
	16	ο Piscium . . .	E.	47.9	50.6	52.0	58 0	0.2	2.3	8.7	10.0	12.8	39 0.28	− 0.42	−12.37	−12.36	1 38 47.50	− 0.02
	17	β Arietis	E.	43.7	46.5	48.0	54.6	56.7	58.9	5.5	7.0	9.9	47 56.76	− 0.38	−12.37	−12.36	1 47 44.02	+ 0.03
	18	50 Cassiopeæ. . .	E.	19.7	27.9	33.0	52.5	58.9	5.5	25.4	29.7	38.2	52 58.98	− 0.06	. .	−12.36	1 52 46.56	− 0.11
	19	α Arietis	E.	. .	. .	. .	. .	. .	. .	29.2	30.9	33.7	0 20.36	− 0.37	−12.3	−12.36	2 0 7.63	+ 0.03
	20	B. A. C. 713 . .	E.	. .	. .	. .	. .	. .	. .	25.9	27.8	30.9	12 15.69	− 0.55	. .	−12.35	2 12 2.79	− 0.52
	21	B. A. C. 751 . .	E.	29.4	32.8	34.8	13.0	45.7	48.5	56.6	58.7	2.0	19 45.72	− 0.61	. .	−12.35	2 19 32.76	− 0.67
	22	B. A. C. 788 . .	E.	56.0	57.9	2.9	5.4	7.8	10.4	12.9	17.9	19.6	28 7.87	− 0.57	. .	−12.35	2 27 54.95	− 0.60
	23	B. A. C. 812 . .	E.	. .	. .	4.2	6.6	9.0	11.4	13.7	. .	. .	33 8.98	− 0.55	. .	−12.35	2 32 56.08	− 0.55
	24	Pallas	E.	19.0	20.6	25.[illegible]	27.4	29.6	31.9	34.1	38.7	40.3	37 29.62	− 0.52	. .	−12.35	2 37 16.75	. .
	25	B. A. C. 937 . .	E.	29.3	32.5	34.7	42.5	45.2	48.0	55.9	57.9	1.4	53 45.27	− 0.61	. .	−12.35	2 53 32.31	− 0.87
	26	B. A. C. 938 . .	E.	30.0	33.4	35.5	43.4	46.0	48.9	56.9	58.8	2.2	53 46.12	− 0.61	. .	−12.35	2 53 33.16	− 0.87
	27	Juno	E.	36.6	39.0	40.6	46.7	48.8	50.8	56.9	58.4	1.0	57 48 76	− 0.45	. .	−12.35	2 57 35.96	. .
	28	B. A. C. 984 . .	E.	47.5	49.5	54.6	57.0	59.4	2.0	4.7	9.6	11.5	3 59.53	− 0.58	. .	−12.35	3 3 46.60	− 0.82
	29	B. A. C. 1003 . .	E.	6.1	9.6	11.5	18.9	21.6	24.0	31.6	33.5	36.8	8 21.51	− 0.58	. .	−12.35	3 8 8.58	− 0.85
	30	η Tauri	E.	3.0	6.0	7.6	14.2	16.5	18.7	25.5	27.0	30.0	40 16.50	− 0.37	−12.3	−12.35	3 40 3.78	− 0.03
	31	ζ Persei	E.	15.4	18.4	20.2	27.5	29.8	32.1	39.4	41.2	44.1	46 29.79	− 0.35	−12.33	−12.34	3 46 17.10	− 0.02
	32	Vesta	E.	10.0	12.7	14.2	20.6	22.8	24.9	31.3	32.7	35.4	50 22.73	− 0.40	. .	−12.35	3 50 9.98	. .
	33	γ¹ Eridani. . . .	E.	15.6	17.0	21.3	23.4	25.5	27.6	29.7	33.8	35.5	52 25.49	− 0.48	−12.40	−12.34	3 52 12.67	+ 0.10
	34	B. A. C. 1294 . .	E.	5.9	9.0	11.0	18.5	21.0	23.5	31.0	32.8	36.0	6 20.97	− 0.57	. .	−12.35	4 6 8.05	− 1.11
	35	B. A. C. 1310 . .	E.	19.9	21.9	27.3	30.0	32.7	35.5	38.2	43.6	45.7	9 32.76	− 0.60	. .	−12.35	4 9 19.81	− 1.26
	36	B. A. C. 1333 . .	E.	9.1	12.3	14.0	21.5	23.9	26.4	33.9	35.6	38.7	13 23.93	− 0.57	. .	−12.35	4 13 11.01	− 1.11
	37	B. A. C. 1368 . .	E.	31.6	34.8	36.7	44.3	46.7	49.2	56.8	58.7	1.9	18 46.74	− 0.58	. .	−12.35	4 18 33.81	− 1.17
	38	Astræa	E.	54.4	56.8	58.8	4.9	7.0	9.2	15.5	17.2	19.8	23 7.07	− 0.40	. .	−12.35	4 22 54.32	. .
13	39	δ Ursæ Minoris . .	Sk.	. .	. .	17.5	52.0	26.0	0.5	34.5	. .	. .	12 26.10	+ 4.57	. .	−12.81	18 12 17.86	− 0.87
	40	α Lyræ	Sk.	37.8	41.1	43.0	50.8	53.6	56.1	3.9	5.9	9.2	32 53.49	− 0.21	−12.70	−12.80	18 32 40.48	− 0.02
	41	β Lyræ	Sk.	24.6	27.6	29.4	36.8	39.2	41.6	49.0	50.8	53.8	45 39.20	− 0.25	−12.83	−12.80	18 45 26.15	+ 0.06
	42	ζ Aquilæ. . . .	Sk.	39.0	41.6	43.1	49.5	51.6	53.7	0.0	1.6	4.1	59 51.58	− 0.38	−12.90	−12.80	18 59 38.40	+ 0.18
14	43	Sun I, N. . . .	Sk.	14.8	17.6	19.2	25.9	28.0	30.3	36.8	38.5	41.2	43 28.03	− 0.58	. .	−12.81	19 43 14.64	. .
	44	Sun II, S. . . .	Sk.	35.0	37.7	39.6	46.0	48.2	50.5	57.0	58.7	1.4	45 48.23	− 0.58	. .	−12.81	19 45 34.84	. .
	45	ζ Cygni	Sk.	34.3	37.2	38.9	45.9	48.3	50.7	57.7	59.5	2.4	7 48.32	− 0.28	−12.87	−12.80	21 7 35.24	+ 0.08
	46	β Cephei	Sk.	. .	. .	. .	. .	. .	. .	34.2	38.5	46.5	27 10.21	+ 0.37	. .	−12.80	21 26 57.78	+ 0.08
	47	ε Pegasi	Sk.	2.0	4.7	6.3	12.4	14.5	16.5	22.8	24.4	26.9	38 14.50	− 0.40	−12.70	−12.80	21 38 1.30	− 0.09
	48	α Aquarii. . . .	Sk.	21.5	24.0	25.7	31.7	33.8	35.8	41.9	43.5	46.0	59 33.77	− 0.46	−12.77	−12.80	21 59 20.51	0.00
	49	B. A. C. 326 . .	Sk.	45.6	48.6	50.4	57.7	0.2	2.7	10.4	11.8	14.9	2 0.26	− 0.67	. .	−12.84	1 1 46.75	+ 0.04

12, 39. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	0 10	10 5.5	29.4	0.5	26.8	35	. .	340	. .	360	. .	31.4	0 13 44.1	25.2	+ 0.2	51 20 5.5	− 0.8
2	5 36	4.5	28.0	27.2	23.5	31	. .	. .	. .	970	005	31.4	5 40 38.2	. .	+ 6.2	56 47 5.6	+ 1.1
3	60 52	1.5	2.7	3.4	9.2	34	450	480	. .	. .	. .	31.4	60 55 53.0	. .	+ 1 50.6	112 4 4.8	. .
4	60 20	2.4	4.7	4.7	11.7	36	. .	. .	. .	605	635	31.4	60 23 19.4	28.2	+ 1 48.1	111 31 28.7	. .
5	354 0	9.8	3.4	2.3	0.0	34	. .	925	. .	905	. .	31.4	354 3 47.5	. .	− 6.4	45 10 2.3	+ 2.0
6	9 6	7.7	0.5	2.5	28.0	31	. .	605	. .	635	. .	31.4	9 10 39.5	. .	+ 9.9	60 17 10.6	+ 1.0
7	336 46	7.6	1.3	0.5	27.6	31	. .	565	. .	595	. .	31.4	336 50 41.0	. .	− 26.3	27 56 35.9	− 1.7
8	29 30	12.3	4.3	4.0	0.0	30	. .	000	. .	015	. .	31.4	29 35 1.1	. .	+ 34.8	80 41 57.1	+ 1.2
9	39 44	6.7	29.3	29.8	26.0	32	. .	145	. .	170	. .	31.4	39 48 32.8	. .	+ 51.1	90 55 45.1	+ 2.5
10	69 4	8.6	0.5	28.5	27.5	32	. .	935	. .	010	. .	31.4	69 8 19.4	. .	+ 2 39.2	120 17 19.8	+ 3.0
11	24 18	7.6	29.5	28.3	26.3	37	110	130	. .	. .	. .	31.4	24 21 16.7	32.5	+ 27.7	75 28 5.6	+ 3.6
12	49 40	9.5	2.3	29.7	26.8	33	850	. .	010	. .	210	31.4	49 44 2.6	. .	+ 1 12.1	100 51 35.9	. .
13	310 12	7.2	0.6	27.7	27.3	34	480	. .	455	. .	500	31.7	310 15 57.6	. .	− 1 13.3	1 21 5.5	+ 0.6
14	47 38	6.4	28.8	28.3	24.7	32	880	910	. .	930	950	31.7	47 42 22.0	25.0	+ 1 8.2	98 49 51.4	+ 3.6
15	24 8	4.5	28.1	26.2	24.0	37	915	935	. .	950	995	31.7	24 11 6.8	. .	+ 27.9	75 17 55.9	+ 3.4
16	30 18	12.0	6.0	2.3	29.2	36	445	460	. .	490	530	31.7	30 21 22.5	. .	+ 36.4	81 28 20.1	+ 2.5
17	18 38	8.0	2.4	1.0	27.5	36	. .	205	. .	215	. .	31.7	18 41 29.4	. .	+ 21.0	69 48 11.6	+ 5.0
18	327 2	10.2	4.9	1.5	28.4	37	. .	670	. .	730	. .	31.7	327 5 5.9	. .	− 40.3	18 10 46.8	+ 0.1
19	15 58	8.0	1.3	29.5	26.5	38	. .	. .	. .	090	130	31.7	16 1 1.6	. .	+ 17.9	67 7 40.7	+ 2.3
20	75 20	10.4	4.5	0.2	29.5	34	. .	. .	. .	920	980	31.7	75 23 47.1	. .	+ 3 55.5	126 34 3.8	−11.0
21	80 8	10.9	3.0	28.5	27.5	31	. .	295	. .	305	. .	31.7	80 12 43.9	. .	+ 5 49.2	131 24 54.3	−11.8
22	73 58	12.5	5.0	2.3	28.6	32	. .	. .	. .	800	850	31.7	74 2 18.7	. .	+ 3 35.2	125 12 15.1	−10.0
23	69 30	12.8	4.5	3.2	29.1	30	. .	. .	. .	070	070	31.7	69 35 0.6	. .	+ 2 46.3	120 44 8.1	− 8.6
24	62 58	10.5	2.1	0.5	28.0	32	. .	240	. .	280	. .	31.7	63 2 29.1	. .	+ 2 2.1	114 10 52.4	− 3.8
25	79 32	15.0	7.7	3.0	0.6	31	050	. .	. .	. .	100	31.7	79 36 42.9	. .	+ 5 30.6	130 48 34.7	−10.0
26	79 32	15.0	7.7	3.0	0.6	31	. .	130	. .	160	. .	31.7	79 36 42.2	. .	+ 5 30.6	130 48 34.0	−10.0
27	40 30	19.8	10.6	7.4	4.8	31	. .	260	. .	340	. .	31.7	40 34 36.0	. .	+ 53.4	91 41 50.6	− 4.0
28	74 40	15.0	5.5	3.5	1.5	31	. .	. .	. .	980	985	31.7	74 44 29.8	. .	+ 3 45.5	125 54 36.5	− 8.3
29	75 10	14.0	4.8	1.8	28.5	31	. .	440	. .	420	. .	31.7	75 14 39.7	. .	+ 3 53.6	126 24 54.5	− 8.2
30	15 6	11.4	3.8	1.2	28.8	33	. .	280	. .	350	. .	31.7	15 10 12.2	. .	+ 17.0	66 16 50.4	+ 1.0
31	7 18	9.0	2.7	1.3	27.7	31	. .	435	. .	400	. .	31.7	7 22 42.4	. .	+ 8.1	58 29 11.7	+ 1.4
32	23 20	18.5	12.0	8.1	4.2	36	. .	275	. .	185	. .	31.7	23 23 20.6	. .	+ 27.1	74 30 8.9	− 2.0
33	52 40	9.5	1.5	29.7	26.4	33	. .	305	. .	340	. .	31.7	52 44 13.9	. .	+ 1 22.1	103 51 57.2	+ 1.8
34	74 22	14.0	6.1	2.4	0.8	34	. .	140	. .	120	. .	31.7	74 25 57.3	. .	+ 3 41.8	125 36 0.3	− 4.9
35	79 24	12.2	4.1	0.5	28.2	30	. .	610	. .	540	. .	31.7	79 28 53.8	21.0	+ 6 27.5	130 41 42.5	− 5.6
36	72 52	15.7	8.3	3.5	0.6	31	. .	300	. .	400	. .	31.7	72 56 38.7	. .	+ 3 21.9	124 6 21.8	− 4.2
37	74 36	9.3	1.0	25.0	26.6	33	. .	580	. .	520	. .	31.7	74 40 11.5	. .	+ 3 45.5	125 50 18.2	− 4.2
38	24 18	10.0	3.2	29.5	27.8	30	. .	. .	. .	990	995	31.7	24 22 49.3	. .	+ 28.4	75 29 38.9	− 2.6
39	312 14	1.9	26.0	24.0	21.2	32	. .	. .	. .	540	618	31.1	312 18 31.8	33.9	− 1 6.5	3 23 46.5	− 1.2
40	0 10	3.4	29.5	27.8	23.2	35	. .	. .	. .	412	538	31.1	0 13 44.5	. .	+ 0.2	51 20 5.9	− 1.4
41	5 36	2.7	27.6	23.6	23.1	32	055	. .	. .	. .	130	31.1	5 40 37.7	. .	+ 6.0	56 47 4.9	− 0.5
42	25 8	2.3	27.5	24.0	23.4	32	. .	. .	. .	055	090	31.1	25 12 38.0	. .	+ 28.5	76 19 27.7	+ 1.8
43	59 48	7.9	3.6	2.3	29.7	29	580	608	. .	. .	. .	31.1	59 53 8.1	. .	+ 1 43.8	111 1 13.1	. .
44	60 22	13.6	7.0	5.4	2.5	35	. .	. .	. .	090	140	31.1	60 25 40.9	35.0	+ 1 46.0	111 33 48.1	. .
45	9 6	3.1	27.5	26.0	22.5	31	892	. .	. .	. .	950	31.1	9 10 39.8	. .	+ 9.7	60 17 10.7	+ 0.4
46	328 50	4.9	0.0	28.1	24.5	36	. .	. .	. .	472	. .	31.1	328 53 28.7	. .	− 36.3	19 59 13.6	− 1.7
47	29 30	4.8	29.0	25.5	23.1	30	378	360	. .	. .	. .	31.1	29 35 2.0	. .	+ 34.1	80 41 57.3	+ 1.0
48	39 44	4.8	28.6	27.0	23.0	32	380	378	. .	. .	. .	31.1	39 48 30.9	37.4	+ 50.1	90 55 42.2	− 0.6
49	72 16	5.5	27.5	24.0	22.5	35	864	915	. .	. .	. .	31.9	72 19 39.0	. .	+ 3 8.8	123 29 9.0	−13.0

No.	Barom.	At. Ther.
	in.	°
1	30.34	22.5
4	30.33	25.0
11	30.33	30.0
14	30.36	28.0
35	30.35	25.0
40	30.15	32.8
45	30.12	32.5
49	30.13	38.9

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
3	− 7.9	− 16 8.0	. .	− 16 25.9
4	− 7.8	+ 16 8.0	. .	+ 16 10.2
12	−44 13.9	− 15 53.1	. .	−1 0 7.0
43	− 7.8	+ 16 17.5	. .	+ 16 9.7
44	− 7.8	− 16 17.5	. .	− 16 25.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscel.an'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Jan. 14	1	Polaris	Sk.	. .	. .	41.0	5.0	31.5	0.0	26.5	. .	. .	12 32.80	+12.76	. .	−12.80	1 12 32.76	+ 0.39
	2	θ eti.	Sk.	49.9	51.4	55.6	57.6	59.6	1.7	3.7	7.9	9.4	17 59.64	− 0.49	−12.80	−12.80	1 17 46.35	+ 0.02
	3	Moon I, S.	Sk.	30.8	32.7	34.4	40.8	42.8	44.9	51.4	53.0	55.6	32 42.88	− 0.39	. .	−12.83	1 32 29.66	+68.01
	4	Neptune	Sk.	41.8	43.3	47.5	49.5	51.6	53.6	55.7	59.8	1.2	46 51.56	− 0.39	. .	−12.82	1 46 38.35	. .
	5	50 Cassiopeæ	Sk.	. .	. .	46.0	52.1	58.8	5.7	11.8	. .	. .	52 58.88	+ 0.53	. .	−12.80	1 52 46.61	+ 0.11
	6	α Arietis	Sk.	7.5	10.2	11.9	18.4	20.8	22.9	29.5	31.2	33.9	0 20.70	− 0.30	−12.83	−12.80	2 0 7.60	+ 0.04
	7	ξ¹ Ceti.	Sk.	23.4	26.0	27.5	33.6	35.7	37.8	43.9	45.5	48.1	6 35.72	− 0.39	. .	−12.80	2 6 22.53	+ 0.08
	8	B. A. C. 713	Sk.	0.7	4.0	5.8	13.3	15.9	18.5	26.1	28.0	31.4	12 15.97	− 0.70	. .	−12.82	2 12 2.45	− 0.47
	9	B. A. C. 746	Sk.	55.8	59.0	1.0	8.7	11.3	14.0	21.8	23.8	27.0	18 11.38	− 0.71	. .	−12.82	2 17 57.85	− 0.54
	10	B. A. C. 783	Sk.	4.5	7.6	9.7	17.3	19.8	22.4	30.1	32.3	35.4	27 19.90	− 0.70	. .	−12.82	2 27 6.38	− 0.57
	11	γ eti.	Sk.	50.7	53.2	54.8	0.9	2.9	4.9	11.0	12.6	15.2	37 2.91	− 0.43	−12.83	−12.80	2 36 49.68	+ 0.03
	12	Pallas	Sk.	. .	. .	7.1	9.3	11.6	13.6	15.9	. .	. .	39 11.50	− 0.59	. .	−12.81	2 38 58.10	. .
	13	Vesta	Sk.	47.7	50.4	52.0	58.4	0.5	2.6	8.8	10.5	13.0	50 0.43	− 0.35	. .	−12.79	3 49 47.29	. .
	14	B. A. C. 1294	Sk.	6.4	9.7	11.5	19.0	21.5	24.0	31.5	33.3	36.4	6 21.48	− 0.69	. .	−12.78	4 6 8.01	− 1.07
	15	B. A. C. 1310	Sk.	17.0	20.5	22.5	30.5	33.3	35.9	44.2	46.0	49.7	9 33.29	− 0.74	. .	−12.78	4 9 19.77	− 1.21
	16	B. A. C. 1368	Sk.	32.0	35.2	37.0	44.6	47.0	49.6	57.3	59.0	2.3	18 47.11	− 0.69	. .	−12.78	4 18 33.64	− 1.13
	17	B. A. C. 1440	Sk.	13.7	16.6	18.3	25.3	27.7	30.0	37.6	39.3	42.3	32 27.87	− 0.64	. .	−12.78	4 32 14.45	− 1.08
	18	B. A. C. 1480	Sk.	12.0	15.0	16.8	24.2	26.8	29.3	36.6	38.5	41.6	41 26.76	− 0.68	. .	−12.77	4 41 13.31	− 1.18
	19	B. A. C. 1533	Sk.	42.6	45.8	47.9	55.8	. .	1.1	9.2	11.2	14.7	50 58.54	− 0.73	. .	−12.77	4 50 45.04	− 1.34
	20	B. A. C. 1573	Sk.	54.5	57.5	59.5	6.8	9.4	11.9	19.5	21.2	24.4	0 9.41	− 0.69	. .	−12.77	4 59 55.95	− 1.26
	21	B. A. C. 1630	Sk.	19.7	23.0	25.0	32.5	35.0	37.5	45.0	47.0	50.0	9 34.97	− 0.69	. .	−12.77	5 9 21.51	− 1.30
	22	B. A. C. 1666	Sk.	50.3	53.5	55.2	2.8	5.3	7.9	15.5	17.3	20.4	16 5.36	− 0.68	. .	−12.77	5 15 51.91	− 1.29
	23	α Leporis	Sk.	14.6	17.2	18.9	25.3	27.4	29.6	36.0	37.6	40.2	27 27.42	− 0.55	−12.74	−12.80	5 27 14.07	− 0.10
	24	ε Orionis.	Sk.	54.3	56.8	58.4	4.4	6.5	8.5	14.5	16.0	18.7	30 6.46	− 0.45	−12.79	−12.80	5 29 53.21	− 0.02
	25	B. A. C. 1814	Sk.	46.0	49.2	51.0	58.6	1.2	3.6	11.0	13.0	16.0	38 1.07	− 0.68	. .	−12.76	5 37 47.63	− 1.33
	26	α Orionis.	Sk.	26.0	28.7	30.2	36.4	38.4	40.5	46.6	48.2	50.8	48 38.42	− 0.40	−12.74	−12.80	5 48 25.22	− 0.09
	27	B. A. C. 1922	Sk.	. .	. .	16.3	18.6	21.2	23.8	26.2	. .	. .	33 21.22	− 0.69	. .	−12.75	5 53 7.78	− 1.37
	28	B. A. C. 1976	Sk.	33.5	36.7	38.6	45.8	48.4	50.9	58.4	0.2	3.3	2 48.42	− 0.68	. .	−12.75	6 2 34.99	− 1.36
	29	δ Ursæ Minoris, S. P.	Sk.	. .	. .	. .	. .	3.0	27.5	18.0	52.5	9.5	12 36.59	− 5.55	. .	−12.80	18 12 18.24	− 0.54
	30	Ceres	Sk.	42.7	45.6	47.3	54.3	56.6	58.8	6.0	7.6	10.5	15 56.60	− 0.26	. .	−12.75	6 15 43.59	. .
	31	δ Ursæ Minoris.	E.	. .	. .	18.0	51.0	26.5	1.0	35.0	. .	. .	12 26.30	+ 4.76	. .	−12.77	18 12 18.29	− 0.53
	32	α Lyræ	E.	37.9	41.1	43.2	51.0	53.6	56.2	4.1	6.1	9.4	32 53.62	− 0.32	−12.76	−12.77	18 32 40.53	+ 0.01
	33	β Lyræ	E.	24.7	27.8	29.7	36.8	39.4	42.0	49.0	51.0	53.9	45 39.37	− 0.37	−12.87	−12.77	18 45 26.23	+ 0.13
	34	ζ Aquilæ.	E.	39.3	41.8	43.4	49.8	51.9	54.0	0.1	1.7	4.5	59 51.83	− 0.52	−13.00	−12.77	18 59 38.54	+ 0.31
15	35	Sun I, S.	E.	33.0	35.9	37.4	44.0	46.3	48.5	55.0	56.8	59.4	47 46.26	− 0.76	. .	−12.85	19 47 32.65	. .
	36	Sun II, N.	E.	53.2	56.0	57.6	4.2	6.4	8.6	15.0	16.8	19.5	50 6.37	− 0.76	. .	−12.85	19 49 52.76	. .
	37	α Cygni	E.	3.7	7.4	9.6	18.2	21.0	24.0	32.7	34.7	38.4	37 21.08	− 0.26	−12.86	−12.77	20 37 8.05	+ 0 11
	38	ζ Cygni	E.	34.4	37.0	38.9	45.9	48.4	50.8	57.8	59.6	2.6	7 48.38	− 0.40	−12.81	−12.77	21 7 35.21	+ 0.05
	39	ε Pegasi	E.	2.2	5.0	6.5	12.7	14.8	16.9	23.0	24.7	27.2	38 14.78	− 0.55	−12.83	−12.77	21 38 1.46	+ 0.07
	40	Polaris	E.	. .	. .	40.0	4.0	32.0	58.0	26.0	. .	. .	12 32.00	+11.21	. .	−12.77	1 12 30.44	− 1.12
	41	θ¹ Ceti	E.	47.3	49.9	51.4	57.7	59.7	1.8	8.0	9.5	12.1	17 59.71	− 0.72	−12.65	−12.77	1 17 46.22	− 0.10
	42	38 Cassiopeæ.	E.	33.0	40.3	44.9	2.4	8.2	14.0	31.5	36.0	43.2	22 8.17	+ 0.15	. .	−12.77	1 21 55.55	− 0.01
	43	η Piscium	E.	48.0	50.7	52.3	58.6	0.7	2.8	9.0	10.6	13.4	25 0.68	− 0.57	−12.71	−12.77	1 25 47.34	+ 0.01
	44	B. A. C. 489¹	E.	. .	. .	30.8	33.0	35.6	38.0	40.2	. .	. .	30 35.52	− 0.87	. .	−12.68	1 30 21.97	− 0.10
	45	B. A. C. 528	E.	30.8	34.0	36.0	43.5	46.1	48.8	56.5	58.3	1.6	36 46.18	− 0.94	. .	−12.68	1 36 32.56	− 0.23
	46	ο Piscium	E.	48.5	51.0	52.5	58.8	0.8	2.9	9.1	10.6	13.2	39 0.82	− 0.61	−12.77	−12.77	1 38 47.44	− 0.03
	47	Neptune	E.	. .	. .	48.3	50.4	52.5	54.5	56.7	. .	. .	46 52.48	− 0.60	. .	−12.68	1 46 39.20	. .
	48	β Arietis	E.	44.2	46.8	48.4	55.0	57.1	59.4	5.9	7.5	10.3	47 57.18	− 0.54	−12.68	−12.77	1 47 43.87	+ 0.07
	49	50 Cassiopeæ	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . .	. .
	50	α Arietis	E.	. .	. .	18.5	20.7	22.9	25.1	29.5	31.2	34.0	0 20.68	− 0.52	−12.60	−12.77	2 0 7.39	− 0.16

3, 13. Wire A used.
3, 5, 29. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	310 12	10 8.8	3.0	2.3	25.8	34	. .	590	520	560	. .	31.9	310 15 54.7	. .	− 1 11.7	1 21 4.2	− 0.7
2	47 38	5.2	27.9	21.2	21.4	32	012	980	. .	. .	. .	31.9	47 42 24.2	31.9	+ 1 6.8	98 49 52.2	+ 4.2
3	29 24	5.1	28.5	22.7	22.5	33	780	. .	092	. .	310	31.9	29 30 55.7	. .	+ 34.4	80 37 51.3	. .
4	29 40	6.4	28.6	24.2	22.5	31	340	330	. .	. .	. .	31.9	29 44 48.3	. .	+ 34.8	80 51 44.3	. .
5	327 2	5.3	29.2	23.6	22.5	38	. .	. .	. .	140	172	31.9	327 5 4.6	. .	− 39.4	18 10 46.4	− 0.1
6	15 58	4.5	28.1	23.9	21.8	38	330	345	. .	. .	. .	31.9	16 1 2.0	. .	+ 17.5	67 7 40.7	+ 2.2
7	30 34	4.8	28.3	23.0	21.0	36	. .	690	. .	802	. .	31.9	30 37 26.8	. .	+ 36.0	81 44 24.0	+ 0.4
8	75 20	4.2	26.0	24.0	20.6	35	090	050	. .	. .	. .	31.9	75 23 52.3	. .	+ 3 50.0	126 34 3.5	−11.2
9	76 54	4.1	26.5	29.5	20.6	33	660	840	. .	. .	. .	31.9	76 58 11.0	. .	+ 4 18.1	128 8 50.3	−11.3
10	75 44	4.9	25.0	20.0	20.7	31	. .	840	. .	. .	. .	31.9	75 48 43.0	. .	+ 3 57.0	126 59 1.2	−10.7
11	36 6	3.7	26.0	21.9	19.8	33	068	. .	. .	. .	. .	31.9	36 10 24.2	. .	+ 44.6	87 17 30.0	+ 0.3
12	62 26	3.3	25.5	20.5	20.3	35	. .	. .	. .	570	655	31.9	62 29 47.7	30.2	+ 1 56.6	113 38 5.5	− 3.8
13	23 8	4.5	26.8	22.1	21.5	39	. .	218	. .	222	. .	31.9	23 13 22.5	. .	+ 26.2	74 20 9.9	− 1.9
14	74 22	7.1	28.5	23.5	24.0	34	212	290	. .	. .	. .	31.9	74 26 2.8	. .	+ 3 36.7	125 36 0.7	− 5.4
15	79 24	3.3	25.6	20.3	20.2	30	730	755	. .	. .	. .	31.9	79 28 59.9	. .	+ 5 20.1	130 40 41.2	− 6.1
16	74 36	4.5	25.2	19.0	20.1	33	420	430	. .	. .	. .	31.9	74 40 19.0	. .	+ 3 40.3	125 50 20.5	− 4.7
17	69 28	4.3	25.0	20.4	19.8	34	. .	695	. .	708	. .	31.9	69 31 59.8	. .	+ 2 42.9	120 41 3.9	− 3.1
18	73 0	5.0	25.9	21.1	23.0	32	. .	926	. .	958	. .	31.9	73 4 25.4	. .	+ 3 19.2	124 14 5.8	− 3.2
19	78 34	4.8	27.2	18.8	20.5	32	. .	145	. .	242	. .	31.9	78 38 37.7	. .	+ 4 57.6	129 49 56.5	− 3.5
20	74 26	2.7	23.8	18.2	19.9	37	. .	084	. .	172	. .	31.9	74 29 21.3	. .	+ 3 38.1	125 39 20.6	− 2.4
21	74 44	6.5	28.5	22.7	23.0	33	. .	. .	. .	798	820	31.9	74 48 10.8	. .	+ 3 42.9	125 58 14.9	− 2.0
22	73 36	3.3	25.5	20.2	22.5	35	. .	648	. .	710	. .	31.9	73 39 44.3	. .	+ 3 27.0	124 49 32.5	− 1.5
23	56 42	7.4	29.3	27.0	24.4	30	. .	. .	. .	980	008	31.9	56 46 52.3	. .	+ 1 33.7	107 54 47.2	+ 1.4
24	40 6	4.5	26.0	23.8	21.5	35	. .	690	. .	768	. .	31.9	40 9 42.7	. .	+ 51.9	91 16 55.8	− 0.4
25	73 30	5.2	25.1	18.5	21.8	34	. .	490	. .	450	. .	31.9	73 34 3.0	. .	+ 3 26.0	124 43 50.2	− 0.3
26	31 26	2.4	26.6	22.0	21.1	34	. .	. .	. .	565	. .	31.9	31 30 1.7	. .	+ 37.7	82 37 0.6	+ 1.3
27	74 4	2.5	23.6	17.5	17.6	34	. .	. .	. .	902	910	31.9	74 7 58.9	. .	+ 3 33.7	125 17 53.8	+ 0.5
28	73 4	5.0	27.3	22.3	21.6	33	. .	978	. .	176	. .	31.9	73 8 7.7	. .	+ 3 20.7	124 17 49.6	+ 1.1
29	305 28	4.1	28.1	23.3	22.8	37	. .	. .	. .	295	195	31.9	305 31 18.0	. .	− 1 26.1	356 36 13.1	+ 0.9
30	9 34	5.2	29.0	26.9	23.2	37	. .	938	. .	032	. .	31.9	9 37 6.2	25.8	+ 10.4	60 43 37.8	− 0.9
31	312 14	6.0	0.2	27.0	26.5	32	025	. .	030	. .	050	29.9	312 18 33.8	. .	− 1 9.2	3 23 45.8	− 2.2
32	0 10	10.6	4.0	2.7	28.7	34	. .	890	. .	935	. .	29.9	0 13 45.9	19.0	+ 0.3	51 20 7.4	− 0.2
33	5 36	7.8	2.4	0.5	27.8	31	. .	700	. .	690	. .	29.9	5 40 37.0	. .	+ 6.3	56 47 4.5	− 1.1
34	25 8	4.2	27.5	25.5	23.8	31	. .	930	. .	940	. .	29.9	25 12 37.5	. .	+ 29.6	76 19 28.3	+ 2.2
35	60 10	8.9	1.6	1.0	29.8	31	105	155	. .	. .	. .	29.9	60 14 43.9	21.5	+ 1 49.1	111 22 54.2	. .
36	59 38	8.0	1.0	0.7	27.8	33	. .	. .	. .	520	640	29.9	59 42 8.5	. .	+ 1 46.8	110 50 16.5	. .
37	354 0	10.0	4.3	3.6	0.3	34	. .	835	. .	895	. .	29.9	354 3 46.1	. .	− 6.5	45 10 0.8	− 0.7
38	9 6	10.3	3.8	3.7	28.8	31	. .	370	. .	390	. .	29.9	9 10 39.7	. .	+ 10.1	60 17 11.0	+ 0.5
39	29 30	11.6	4.2	3.8	29.2	30	. .	030	. .	075	. .	29.9	29 34 59.4	22.5	+ 35.5	80 41 56.1	− 0.3
40	310 12	9.5	2.5	0.5	28.5	34	290	. .	280	. .	225	33.6	310 16 0.7	. .	− 1 14.1	1 21 7.8	+ 2.9
41	47 38	7.6	0.6	29.2	25.7	32	. .	990	. .	025	. .	33.6	47 42 21.7	. .	+ 1 9.0	98 49 51.9	+ 3.9
42	329 12	8.6	2.0	29.8	27.5	31	. .	370	. .	375	. .	33.6	329 16 46.4	. .	− 37.4	20 22 30.2	+ 2.3
43	24 8	8.9	3.0	1.0	27.5	37	. .	820	. .	850	. .	33.6	24 11 6.0	19.0	+ 28.2	75 17 55.4	+ 2.6
44	69 20	11.9	4.1	2.4	28.8	34	. .	. .	. .	275	340	33.6	69 23 58.3	. .	+ 2 46.1	120 33 5.6	−11.3
45	76 14	9.5	1.8	28.6	25.5	36	. .	370	. .	430	. .	33.6	76 17 28.9	. .	+ 4 13.3	127 28 3.4	−12.8
46	30 18	10.8	3.0	0.8	28.0	36	. .	710	. .	750	. .	33.6	30 21 22.4	. .	+ 36.8	81 28 20.4	+ 2.5
47	29 40	13.2	5.0	4.5	29.8	31	550	550	. .	. .	. .	33.6	29 44 38.9	. .	+ 35.9	80 51 36.0	. .
48	18 38	13.0	7.7	6.5	0.3	36	. .	990	. .	130	. .	33.6	18 41 28.2	. .	+ 21.3	69 48 10.7	+ 4.0
49	327 2	11.5	5.5	3.5	0.3	37	. .	640	615	645	. .	33.6	327 5 7.1	. .	− 40.7	18 10 47.6	+ 1.1
50	15 58	8.6	29.8	28.8	25.5	38	. .	. .	. .	240	260	33.6	16 1 2.1	. .	+ 18.0	67 7 41.3	+ 2.8

No.	Barom.	At. Ther.
	in.	°
2	30.15	34.0
12	30.13	32.6
30	30.15	28.8
32	30.39	19.5
35	30.35	21.5
39	30.37	. .
43	30.33	21.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
3	−28 56.4	− 16 8.7	. .	− 45 5.1
4	− 0.1	. .	. .	− 0.1
35	− 7.8	− 16 8.8	. .	− 16 26.6
36	− 7.7	+ 16 8.8	. .	+ 16 11.1
47	− 0.1	. .	. .	− 0.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Jan. 15	1	ξ^1 Ceti	E.	23.4	26.0	27.6	33.7	35.7	37.8	44.0	45.5	48.2	6 35.77	− 0.61	−12.68	−12.77	2 6 22.39	− 0.05
	2	B. A. C. 713	E.	0.8	3.9	5.8	13.4	16.0	18.6	26.2	28.0	31.4	12 16.01	− 0.93	. .	−12.70	2 12 2.38	− 0.45
	3	B. A. C. 746	E.	55.8	59.0	0.9	8.7	11.3	14.0	21.6	23.5	27.0	18 11.31	− 0.95	. .	−12.70	2 17 57.66	− 0.52
	4	Moon I, S.	E.	3.2	5.9	7.6	14.0	16.3	18.5	25.0	26.7	29.3	27 16.28	− 0.56	. .	−12.71	2 27 3.01	+70.16
	5	γ Ceti	E.	50.8	53.3	55.0	1.0	3.0	8.1	11.2	12.9	15.5	37 3.09	− 0.64	−12.80	−12.77	2 36 49.68	+ 0.03
	6	α Ceti	E.	46.2	48.7	50.3	56.3	58.3	0.4	6.7	8.2	10.7	55 58.42	− 0.64	−12.74	−12.77	2 55 45.01	− 0.01
	7	Juno	E.	. .	. .	15.0	17.2	19.1	21.0	23.0	. .	. .	1 19.06	− 0.66	. .	−12.71	3 1 5.69	. .
	8	ζ Arietis	E.	43.6	46.2	47.9	54.4	56.6	58.7	5.4	7.0	9.6	7 56.60	− 0.53	−12.75	−12.77	3 7 43.30	− 0.06
16	9	ζ Arietis	F.	43.8	46.5	48.0	. .	. .	. .	5.5	7.0	10.0	7 56.80	− 0.56	−12.94	−12.92	3 7 43.32	− 0.02
	10	γ^2 Ursæ Minoris, S. P.	F.	. .	. .	23.0	17.0	10.4	3.7	56.7	. .	. .	21 10.32	− 1.73	. .	−12.92	15 20 55.67	− 0.02
	11	Moon I, S.	F.	22.8	25.8	27.4	. .	. .	. .	45.6	47.2	49.9	25 36.45	− 0.55	. .	−12.92	3 25 22.98	+72.77
	12	B. A. C. 1136^2	F.	. .	. .	26.9	29.4	32.4	35.0	37.6	. .	. .	35 32.26	− 1.06	. .	−12.92	3 35 18.28	− 1.01
	13	B. A. C. 1145	F.	42.0	46.5	48.1	53.4	58.9	4.6	10.0	11.8	15.6	36 58.99	− 1.07	. .	−12.92	3 36 45.00	− 1.03
	14	ζ Persei	F.	16.0	19.0	20.9	28.0	30.4	32.9	40.0	41.8	44.8	46 30.42	− 0.47	−12.88	−12.92	3 46 17.03	− 0.05
	15	γ^1 Eridani	F.	13.7	16.3	17.8	24.0	26.2	28.4	34.9	36.4	39.0	52 26.30	− 0.80	−12.93	−12.92	3 52 12.58	+ 0.05
19	16	Venus, N.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	17	Venus, S.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	18	β Draconis	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	19	μ Herculis	F.	. .	. .	42.7	44.8	47.2	49.6	51.8	. .	. .	41 47.22	− 0.52	−14.04	−14.07	17 41 32.63	− 0.03
	20	γ Draconis	F.	35.0	39.0	41.6	48.0	54.5	1.0	7.8	10.2	14.4	53 54.61	− 0.24	. .	−14.07	17 53 40.30	− 0.16
	21	η Serpentis	F.	52.0	54.5	56.0	2.0	4.0	6.1	12.2	13.7	16.3	15 4.09	− 0.75	−14.20	−11.08	18 14 49.26	+ 0.18
	22	α Lyræ	F.	. .	. .	49.9	52.5	55.2	57.7	0.4	. .	. .	32.55.14	− 0.41	−14.10	−14.08	18 32 40.65	+ 0.04
	23	β Lyræ	F.	. .	. .	38.3	40.7	43.0	45.6	50.6	52.4	55.4	45 40.72	− 0.47	−14.04	−14.09	18 45 26.16	− 0.02
	24	ζ Aquilæ	F.	40.7	43.3	44.8	51.0	53.2	55.2	1.7	3.1	5.8	59 53.20	− 0.63	−14.18	−14.09	18 59 38.48	+ 0.17
	25	δ Draconis	F.	9.4	16.4	20.3	36.0	41.3	46.6	2.3	6.5	13.6	12 41.38	+ 0.19	. .	−14.09	19 12 27.48	+ 0.05
	26	α Aquilæ	F.	41.8	44.4	46.0	52.2	54.2	56.2	2.5	4.0	6.7	44 54.22	− 0.68	−13.99	−14.10	19 44 39.44	− 0.07
20	27	Sun I, S.	F.	54.3	57.0	58.7	5.1	7.5	9.5	16.0	17.7	20.5	9 7.37	− 0.89	. .	−14.11	20 8 52.37	. .
	28	Sun II, N.	F.	13.6	16.3	18.0	24.4	26.9	29.0	35.3	37.0	39.7	11 26.69	− 0.89	. .	−14.11	20 11 11.69	. .
	29	β Cephei	F.	. .	. .	5.3	11.4	17.6	23.5	35.5	39.6	47.2	27 11.36	+ 0.31	. .	−14.11	21 26 57.56	+ 0.01
	30	ε Pegasi	F.	3.9	6.4	8.0	14.0	16.2	18.4	24.6	26.0	28.7	38 16.24	− 0.66	−14.17	−14.12	21 38 1.46	+ 0.06
	31	α Aquarii	F.	. .	. .	31.4	33.3	35.4	37.4	39.5	. .	. .	59 35.40	− 0.74	−14.12	−14.12	21 59 20.54	+ 0.03
	32	α Piscis Australis	F.	44.3	47.3	49.0	. .	. .	. .	8.0	9.9	12.7	50 58.53	− 0.99	−14.07	−14.13	22 50 43.41	− 0.02
	33	α Pegasi	F.	33.0	35.7	37.2	43.6	45.7	47.8	54.1	55.7	58.3	58 45.68	− 0.63	−14.14	−14.13	22 58 30.92	+ 0.04
22	34	B. A. C. 1333	Sk.	11.5	14.5	16.4	23.8	26.2	28.8	36.3	38.0	41.2	13 26.29	− 1.00	. .	−14.42	4 13 10.87	− 0.95
	35	ε Tauri	Sk.	21.7	24.4	26.0	32.5	34.7	36.8	43.3	45.0	47.7	21 34.68	− 0.58	−14.38	−14.42	4 21 19.68	− 0.05
	36	B. A. C. 1440	Sk.	15.5	18.4	20.2	27.5	29.8	32.2	39.3	40.9	44.1	32 29.77	− 0.96	. .	−14.42	4 32 14.39	− 0.98
	37	B. A. C. 1480	Sk.	13.8	17.0	18.6	26.0	28.4	31.0	38.6	40.3	43.6	41 28.59	− 1.00	. .	−14.42	4 41 13.17	− 1.07
	38	ι Aurigæ	Sk.	52.4	55.5	57.2	4.6	7.0	9.5	16.8	18.5	21.5	49 7.00	− 0.46	−14.47	−14.42	4 48 52.12	+ 0.01
	39	B. A. C. 1564	Sk.	41.4	44.4	46.0	53.3	55.6	58.2	5.3	7.2	10.2	57 55.73	− 0.97	. .	−14.43	4 57 40.33	− 1.10
	40	B. A. C. 1574	Sk.	0.0	3.3	5.2	12.7	15.1	17.7	25.2	27.0	30.1	0 15.14	− 1.01	. .	−14.43	4 59 59.70	− 1.17
	41	B. A. C. 1630	Sk.	22.0	25.1	27.0	34.6	37.0	39.6	47.3	49.2	52.4	9 37.13	− 1.01	. .	−14.43	5 9 21.69	− 1.21
	42	B. A. C. 1666	Sk.	52.6	55.6	57.4	2.3	7.2	12.4	17.5	19.1	22.3	16 7.38	− 1.00	. .	−14.43	5 15 51.95	− 1.20
	43	B. A. C. 1719	Sk.	5.5	8.8	10.8	19.0	21.8	24.5	32.7	34.5	37.8	23 21.71	− 1.07	. .	−14.43	5 23 6.21	− 1.36
	44	B. A. C. 1739	Sk.	48.2	51.5	53.4	0.8	3.5	6.0	13.5	15.3	18.5	27 3.41	− 1.01	. .	−14.43	5 26 47.97	− 1.25
	45	δ Ursæ Minoris, S. P.	Sk.	. .	. .	51.0	16.5	41.5	7.5	32.5	58.0	14.5	12 41.75	− 7.63	. .	−14.43	18 12 19.69	+ 0.23
26	46	α Lyræ	E.	40.0	43.3	45.2	50.5	55.7	4.0	6.2	8.2	11.5	32 55.73	− 0.39	−14.57	−14.59	18 32 40.75	0.00
	47	β Lyræ	E.	26.9	29.9	31.6	38.9	41.6	43.9	51.0	53.0	56.0	45 41.42	− 0.47	−14.61	−14.59	18 45 26.36	+ 0.05
	48	B. A. C. 6491	E.	15.1	18.0	19.9	27.1	29.6	32.0	39.3	41.0	44.1	54 29.57	− 0.48	. .	−14.59	18 54 14.50	+ 1.59
31	49	α Lyræ	F.	43.5	45.5	50.7	53.2	55.9	58.5	1.0	6.2	8.0	32 55.83	− 0.38	−14.56	−14.58	18 32 40.87	0.00
	50	β Lyræ	F.	27.0	30.1	31.9	39.1	41.6	44.0	51.4	53.1	56.3	45 41.61	− 0.46	−14.71	−14.58	18 45 26.57	+ 0.16

10, 12, 18. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″		′ ″	° ′ ″	″
1	30 34	10 8.0	1.2	29.6	26.6	36	. .	600	. .	600	. .	33.6	30 37 26.2	. .	+ 37.2	81 44 24.6	+ 0.9
2	75 20	14.5	6.8	3.4	2.2	34	. .	920	. .	030	. .	33.6	75 23 45.4	. .	+ 3 57.6	126 34 4.2	−11.3
3	76 54	11.3	3.5	0.3	27.6	33	. .	860	. .	880	. .	33.6	76 58 5.8	. .	+ 4 26.5	128 8 53.5	−11.4
4	23 10	15.0	10.5	7.4	3.9	34	800	900	225	640	780	33.6	23 13 38.8	. .	+ 27.0	74 20 27.0	. .
5	36 6	9.2	0.0	29.7	24.9	32	. .	720	. .	715	. .	33.6	36 10 26.0	. .	+ 46.0	87 17 33.2	+ 3.5
6	35 12	7.3	28.1	27.3	24.8	30	. .	690	. .	730	. .	33.6	35 16 58.3	. .	+ 44.5	86 24 4.0	− 0.7
7	39 50	14.5	7.4	6.0	1.0	35	. .	710	. .	620	. .	33.6	39 53 34.6	. .	+ 52.5	91 0 48.3	− 3.8
8	18 14	10.5	4.7	2.7	28.1	32	. .	680	. .	720	. .	33.6	18 18 23.3	19.0	+ 20.8	69 25 5.3	+ 1.8
9	18 14	8.1	1.5	0.3	26.0	32	. .	776	. .	790	. .	33.1	18 18 24.1	28.2	+ 20.3	69 25 5.6	+ 2.1
10	291 8	5.2	0.0	26.4	24.5	32	. .	200	. .	208	. .	33.1	291 12 35.1	. .	− 2 37.0	342 16 19.3	− 1.0
11	17 46	7.6	1.8	29.5	25.6	33	250	522	750	865	985	33.1	17 50 10.7	. .	+ 19.7	68 56 51.6	. .
12	79 30	12.3	3.8	29.4	28.0	34	. .	. .	. .	486	. .	33.1	79 33 56.0	. .	+ 5 23.0	130 45 40.2	− 8.3
13	79 56	5.2	26.5	22.2	22.8	40	. .	. .	. .	628	628	33.1	79 58 28.5	. .	+ 5 35.8	131 10 25.5	− 8.3
14	7 18	4.1	27.5	24.5	23.0	31	. .	902	. .	928	. .	33.1	7 22 41.6	. .	+ 7.9	58 29 10.7	+ 0.5
15	52 40	10.4	1.0	27.9	26.4	33	. .	. .	. .	232	262	33.1	52 44 17.1	28.2	+ 1 20.5	103 51 58.8	+ 2.9
16	56 42	13.6	4.9	5.5	0.7	34	. .	. .	. .	086	. .	31.8	56 45 58.0	. .	+ 1 36.9	107 53 56.1	. .
17	56 42	13.6	4.9	5.5	0.7	31	. .	. .	. .	. .	472	31.8	56 46 37.9	15.0	+ 1 37.0	107 54 36.1	. .
18	346 26	5.4	27.9	27.7	25.0	32	. .	420	. .	400	. .	31.8	346 30 30.9	. .	− 15.2	37 36 36.9	− 2.7
19	11 2	6.5	28.9	1.3	26.7	34	. .	. .	. .	420	250	31.8	11 6 0.1	. .	+ 12.4	62 12 33.7	+ 0.5
20	347 20	7.8	29.2	29.7	26.9	34	. .	650	. .	666	. .	31.8	347 23 54.9	18.7	− 14.1	38 30 2.0	− 1.1
21	41 44	9 29.3	19.8	19.9	21.1	32	. .	056	. .	186	. .	31.8	41 48 41.7	. .	+ 56.4	92 55 59.5	+ 2.7
22	0 10	10 4.4	26.7	27.0	24.8	35	. .	290	. .	292	. .	31.8	0 13 47.7	. .	+ 0.3	51 20 9.2	+ 0.1
23	5 36	6.6	29.6	0.3	26.5	31	. .	. .	. .	666	720	31.8	5 40 40.7	. .	+ 6.3	56 47 8.2	+ 1.1
24	25 8	1.9	24.5	23.4	22.4	32	. .	144	. .	150	. .	31.8	25 12 38.3	. .	+ 29.5	76 19 29.0	+ 1.8
25	331 24	4.1	26.2	25.8	24.5	34	. .	. .	. .	826	854	31.8	331 27 56.6	. .	− 34.1	22 33 43.7	+ 0.2
26	30 16	5.2	22.8	25.3	26.2	31	. .	100	. .	116	. .	31.8	30 20 52.4	22.8	+ 36.6	81 27 50.2	+ 1.7
27	59 10	2.5	24.0	25.5	22.7	33	238	272	. .	. .	. .	31.8	59 14 19.9	24.5	+ 1 44.4	110 22 25.5	. .
28	58 38	9 27.2	19.3	17.3	16.1	35	. .	. .	. .	714	752	31.8	58 41 49.4	. .	+ 1 42.3	109 49 52.9	. .
29	328 50	10 7.0	29.0	28.0	25.9	36	. .	. .	. .	210	190	31.8	328 53 33.6	. .	− 37.4	19 59 17.4	+ 0.3
30	29 30	7.2	29.5	29.5	25.2	30	. .	324	. .	342	. .	31.8	29 35 1.3	. .	+ 35.2	80 41 57.7	+ 0.6
31	39 44	5.8	27.8	27.8	25.5	32	. .	270	. .	400	. .	31.8	39 48 31.7	28.0	+ 51.6	90 55 44.5	+ 1.3
32	69 4	5.7	27.3	25.3	23.7	33	. .	640	. .	540	. .	31.8	69 8 13.5	. .	+ 2 41.0	120 17 15.7	− 0.5
33	24 18	8.0	28.5	29.3	24.8	37	. .	208	. .	236	. .	31.8	24 21 16.0	28.5	+ 28.0	75 28 5.2	+ 2.1
34	72 52	14.2	6.3	26.0	27.5	30	550	510	. .	. .	. .	30.1	72 56 52.8	. .	+ 3 11.4	124 6 25.4	− 6.0
35	19 56	8.0	2.2	26.4	25.4	37	. .	745	. .	845	. .	30.1	19 59 5.3	. .	+ 21.6	71 5 48.1	+ 2.2
36	69 28	11.5	2.1	. .	25.6	33	. .	850	. .	890	. .	30.1	69 32 2.0	41.2	+ 2 38.1	120 41 1.3	− 4.4
37	73 0	5.5	17.4	26.6	19.4	32	462	422	. .	. .	. .	30.1	73 4 32.3	. .	+ 3 13.2	124 14 6.7	− 4.7
38	5 52	8.5	3.5	25.7	25.4	36	. .	582	. .	560	. .	30.1	5 55 23.9	. .	+ 6.2	57 1 51.3	+ 1.5
39	70 44	9.4	0.2	21.5	24.4	33	682	728	. .	. .	. .	30.1	70 48 8.8	. .	+ 2 49.3	121 57 19.3	− 3.6
40	74 38	12.2	3.5	25.5	26.6	30	. .	. .	. .	198	218	30.1	74 42 59.9	. .	+ 3 34.6	125 52 55.7	− 4.1
41	74 44	11.7	3.5	24.4	25.5	32	778	850	. .	. .	. .	30.1	74 48 20.0	. .	+ 3 35.9	125 58 17.1	− 3.7
42	73 36	11.6	3.8	26.6	26.5	34	430	478	. .	. .	. .	30.1	73 39 54.0	. .	+ 3 20.5	124 49 35.7	− 3.2
43	79 48	10.0	2.0	22.0	25.0	36	. .	158	. .	035	. .	30.1	79 51 31.7	. .	+ 5 22.2	131 3 15.1	− 3.6
44	74 20	13.8	5.5	24.5	29.0	34	. .	000	. .	078	. .	30.1	74 23 59.8	. .	+ 3 30.4	125 33 51.4	− 2.8
45	305 28	13.1	6.9	28.7	29.4	36	. .	. .	060	988	958	30.1	305 31 13.3	40.3	− 1 23.4	356 36 11.1	+ 1.5
46	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . . .	29.2	. .	. . . . .	. .
47	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . . .	. .	. .	. . . . .	. .
48	6 18	9.5	3.5	3.2	28.2	31	. .	630	. .	660	. .	32.3	6 22 38.7	. .	+ 6.9	57 29 6.8	−16.3
49	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . . .	. .	. .	. . . . .	. .
50	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . . .	. .	. .	. . . . .	. .

No.	Barom.	At. Ther.
	in.	°
8	30.32	21.0
9	30.14	28.0
15	30.18	28.0
17	30.43	17.5
20	30.44	19.0
26	30.43	23.0
27	30.41	23.2
31	30.45	28.0
33	39.40	28.0
36	30.06	40.5
45	30.11	40.0
46	30.22	26.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
4	−23 12.2	− 16 12.0	. .	− 39 24.2
11	−18 0.3	− 16 13.7	. .	− 34 14.0
16	− 16.1	+ 20.2	− 0.4	+ 3.7
17	− 16.1	− 20.2	. .	− 36.3
27	− 7.7	− 16 16.3	. .	− 16 24.0
28	− 7.7	+ 16 16.3	. .	+ 16 8.6

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	CORRECTIONS. Inst.	Clock appar'nt.	Clock adopted.	Apparent Right Ascension.	Miscellan'us Corrections.
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Jan. 31	1	B. A. C. 7022	F.	45.0	47.0	52.4	54.8	57.7	0.5	3.0	8.3	10.2	17 57.66	− 0.36	. .	−14.63	20 17 42.67	+ 1.98
Feb. 1	2	Sun I, S.	F.	47.6	50.2	51.9	58.2	0.4	2.5	9.0	10.5	13.3	59 0.40	− 1.04	. .	−14.63	20 58 44.73	. .
	3	Sun II, N.	F.	3.9	6.7	8.2	14.7	16.9	19.1	25.4	27.0	29.8	1 16.86	− 1.04	. .	−14.63	21 1 1.19	. .
	4	α Aquarii	F.	23.9	26.6	27.9	34.0	36.1	38.2	44.2	45.8	48.3	59 36.11	− 0.86	−14.68	−14.58	21 59 20.67	+ 0.13
	5	α Pegasi	F.	33.5	36.0	37.8	44.0	46.1	48.2	54.5	56.0	58.8	58 46.10	− 0.69	−14.56	−14.58	22 58 30.83	+ 0.01
	6	B. A. C. 1480	F.	13.9	16.9	18.9	26.2	28.7	31.2	38.6	40.4	43.5	41 28.70	− 1.26	. .	−14.60	4 41 12.84	− 0.91
	7	B. A. C. 1533	F.	44.5	48.0	49.9	57.8	0.6	3.2	11.2	13.1	16.6	51 0.54	− 1.38	. .	−14.61	4 50 44.55	− 1.04
	8	B. A. C. 1564	F.	41.3	44.4	46.0	53.3	55.7	58.2	5.3	7.0	10.3	57 55.72	− 1.23	. .	−14.61	4 57 39.88	− 0.95
	9	B. A. C. 1588	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	10	α Aurigæ	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	11	β Orionis	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	12	δ Ursæ Minoris, S. P.	F.	. .	. .	56.0	22.0	46.0	. .	36.5	. .	. .	12 46.45	−10.53	. .	−14.58	18 12 21.34	+ 0.06
	13	μ Geminorum	F.	. .	. .	. .	. .	. .	. .	48.8	50.5	53.3	15 39.98	− 0.58	−14.38	−14.58	6 15 24.82	− 0.24
4	14	ε Tauri	E.	21.6	24.2	25.8	32.4	34.5	36.7	43.3	44.7	47.6	21 34.53	− 0.26	−14.70	−14.62	4 21 19.65	+ 0.07
	15	B. A. C. 1407	E.	7.5	10.6	12.6	19.9	22.6	25.2	33.0	34.8	37.9	26 22.68	− 0.27	. .	−14.66	4 26 7.75	− 0.81
	16	α Tauri	E.	47.7	50.2	51.8	58.1	0.3	2.4	9.0	10.4	13.0	29 0.32	− 0.26	−14.61	−14.62	4 28 45.44	− 0.03
	17	B. A. C. 1464	E.	38.6	41.9	43.7	51.4	54.0	56.6	4.5	6.4	9.6	37 54.08	− 0.27	. .	−14.65	4 37 39.16	− 0.88
	18	B. A. C. 1480	E.	13.0	16.0	17.9	25.3	27.8	30.0	37.7	39.5	42.7	41 27.77	− 0.27	. .	−14.65	4 41 12.85	− 0.86
	19	ι Aurigæ	E.	52.2	55.4	57.2	4.4	6.8	9.2	16.6	18.3	21.4	49 6.83	− 0.26	−14.65	−14.62	4 48 51.95	− 0.01
	20	B. A. C. 1650	E.	59.6	2.7	4.5	12.0	14.5	17.0	24.5	26.3	29.3	13 14.49	− 0.27	. .	−14.64	5 12 59.58	− 1.00
	21	B. A. C. 1666	E.	51.6	54.7	56.7	4.0	6.6	9.1	16.6	18.5	21.6	16 6.60	− 0.27	. .	−14.64	5 15 51.69	− 1.01
	22	B. A. C. 1694	E.	. .	. .	31.1	33.8	36.3	38.9	41.6	. .	. .	19 36.34	− 0.28	. .	−14.64	5 19 21.42	− 1.06
	23	B. A. C. 1724	E.	57.2	0.6	2.6	10.2	12.6	15.3	23.0	25.0	28.2	24 12.74	− 0.28	. .	−14.64	5 23 57.82	− 1.08
	24	B. A. C. 1976	E.	34.3	37.8	39.7	47.0	49.5	52.0	59.3	1.2	4.4	2 49.47	− 0.27	. .	−14.61	6 2 34.59	− 1.16
	25	δ Ursæ Minoris, S. P.	E.	. .	43.5	11.0	35.5	1.5	27.0	17.5	52.5	9.5	12 35.91	+ 0.90	. .	−14.62	18 12 22.19	+ 0.35
	26	μ Geminorum	E.	26.6	29.3	30.8	37.4	39.6	41.9	48.8	50.5	53.2	15 39.79	− 0.26	−14.52	−14.62	6 15 24.91	− 0.14
	27	B. A. C. 2079	E.	41.8	45.0	46.8	54.4	57.0	59.5	7.2	9.0	12.4	19 57.01	− 0.28	. .	−14.60	6 19 42.13	− 1.25
	28	Brisbane 1230	E.	. .	. .	. .	. .	. .	. .	12.4	14.4	17.5	20 2.27	− 0.28	. .	−14.60	6 19 47.39	− 1.25
	29	γ Geminorum	E.	32.8	35.4	37.0	43.3	45.4	47.6	53.9	55.5	58.2	30 45.46	− 0.26	−14.63	−14.62	6 30 30.58	− 0.02
	30	B. A. C. 2190	E.	24.6	27.9	29.7	37.4	39.9	42.7	50.5	52.3	55.5	34 40.06	− 0.28	. .	−14.59	6 34 25.19	− 1.30
	31	α Canis Majoris	E.	41.4	44.1	45.6	52.0	54.2	56.4	2.7	4.4	7.0	39 54.20	− 0.26	−14.62	−14.62	6 39 39.32	− 0.08
	32	51 Cephei	E.	. .	. .	. .	55.5	39.0	21.0	46.5	17.0	9.0	41 55.87	− 1.52	. .	−14.62	6 41 39.73	+ 0.29
	33	B. A. C. 2282	E.	17.5	20.5	22.6	30.0	32.5	35.0	42.5	44.3	47.5	52 32.49	− 0.27	. .	−14.58	6 52 17.64	− 1.30
	34	B. A. C. 6690	F.	40.4	43.1	45.0	51.8	54.2	56.5	3.3	5.0	7.9	25 54.13	− 0.23	. .	−14.58	19 25 39.32	+ 1.46
	35	γ Aquilæ	F.	20.0	22.7	24.2	30.4	32.5	34.7	40.9	42.4	45.0	40 32.53	− 0.20	−14.58	−14.47	19 40 17.86	+ 0.14
	36	α Aquilæ	F.	42.1	44.8	46.2	52.5	54.6	56.7	2.8	4.4	6.9	44 54.56	− 0.20	−14.56	−14.47	19 44 39.89	+ 0.13
	37	B. A. C. 7022	F.	41.3	44.9	46.9	54.7	57.3	59.9	7.9	9.9	13.5	17 57.37	− 0.26	. .	−14.55	20 17 42.56	+ 1.93
	38	B. A. C. 7149	F.	50.7	53.2	54.9	1.2	3.4	5.5	11.7	13.3	16.0	34 3.32	− 0.21	. .	−14.54	20 33 48.57	+ 1.43
5	39	Sun II, S.	F.	14.0	16.7	18.3	24.8	26.8	29.0	35.5	37.0	39.4	17 26.83	− 0.18	. .	−14.51	21 17 12.14	−67.80
	40	θ Piscium	F.	. .	. .	. .	. .	53.4	55.6	59.5	1.1	3.6	21 51.36	− 0.20	−14.58	−14.47	23 21 36.69	+ 0.17
	41	ω Piscium	F.	55.0	57.5	59.0	5.3	7.4	9.4	15.5	17.0	19.6	53 7.30	− 0.20	−14.48	−14.47	23 52 52.63	+ 0.02
	42	α Andromedæ	F.	55.3	58.0	59.8	6.8	9.2	11.5	18.4	20.0	23.0	2 9.11	− 0.23	−14.44	−14.47	0 1 54.41	− 0.01
	43	γ Pegasi	F.	49.0	51.6	53.1	59.5	1.7	3.8	9.9	11.7	14.3	7 1.62	− 0.21	−14.40	−14.47	0 6 46.94	− 0.07
	44	B. A. C. 1294	F.	7.4	10.4	12.2	19.8	22.3	24.7	32.4	34.2	37.5	6 22.32	− 0.16	. .	−14.48	4 6 7.68	− 0.68
	45	B. A. C. 1333	F.	10.4	13.5	15.3	22.8	25.3	27.8	35.0	36.9	40.0	13 25.22	− 0.16	. .	−14.48	4 13 10.58	− 0.70
	46	B. A. C. 1363	F.	33.0	36.0	37.9	45.3	48.0	50.6	57.9	59.8	3.0	18 47.94	− 0.16	. .	−14.48	4 18 33.30	− 0.75
	47	B. A. C. 1372	F.	. .	. .	31.0	33.4	35.8	38.4	40.8	. .	. .	19 35.88	− 0.16	. .	−14.48	4 19 21.24	− 0.73
	48	ε Tauri	F.	. .	. .	. .	. .	36.5	38.6	42.9	44.6	47.3	21 34.31	− 0.21	−14.54	−14.46	4 21 19.64	+ 0.07
	49	B. A. C. 1464	F.	38.4	41.6	43.5	51.2	53.7	56.4	4.0	6.0	9.2	37 53.78	− 0.16	. .	−14.47	4 37 39.15	− 0.86

1. Eye piece received a blow which bent the rack and pinion bars; instrument apparently not disturbed.
7. Wire A used.
12. Telescope micrometer reading increased five revolutions in reduction.
24. Telescope micrometer reading increased one revolution in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	358 58	10 8.3	2.1	0.5	25.8	32	. .	512	. .	534	. .	31.8	359 2 26.7	28.5	− 1.0	50 8 46.9	−12.5
2	56 8	7.8	0.0	29.7	25.1	32	088	104	. .	. .	. .	28.7	56 12 30.0	29.4	+ 1 31.2	107 20 22.4	. .
3	55 36	4.8	26.6	25.5	21.4	34	. .	. .	. .	230	260	28.7	55 40 2.1	. .	+ 1 29.4	106 47 52.7	. .
4	39 44	3.6	25.5	24.8	22.7	32	. .	214	. .	206	. .	28.7	39 48 33.1	. .	+ 50.8	90 55 45.1	+ 1.1
5	24 18	7.6	29.8	29.3	25.7	36	. .	950	. .	970	. .	28.7	24 21 16.5	33.8	+ 27.5	75 28 5.2	+ 0.7
6	73 0	12.9	28.3	27.2	28.5	32	. .	. .	. .	328	344	32.7	73 4 29.4	26.0	+ 3 20.4	124 14 11.0	− 6.2
7	78 32	13.7	6.2	26.3	29.2	33	. .	720	. .	760	. .	32.7	78 38 39.1	. .	+ 4 59.3	129 49 59.6	− 6.8
8	70 44	11.0	1.3	25.3	26.1	33	840	870	. .	. .	. .	32.7	70 48 7.0	. .	+ 2 55.7	121 57 23.9	− 5.2
9	44 4	9.4	0.0	23.0	23.9	35	. .	852	. .	868	. .	32.7	44 7 38.8	. .	+ 59.8	95 14 59.8	+ 1.2
10	352 58	9.7	3.5	26.1	27.5	36	592	572	. .	. .	. .	32.7	353 1 25.4	. .	− 7.6	44 7 39.0	+ 0.5
11	47 10	10.2	2.2	26.2	25.6	36	. .	. .	. .	596	612	32.7	47 13 25.7	. .	+ 1 6.6	98 20 53.5	+ 2.5
12	305 28	12.0	6.7	28.7	29.1	32	230	. .	240	. .	218	32.7	305 31 12.9	26.5	− 1 26.2	356 36 7.9	+ 1.1
13	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
14	19 56	12.0	8.3	4.2	0.6	37	. .	800	. .	835	. .	35.7	19 59 4.8	20.2	+ 22.7	71 5 48.7	+ 2.6
15	74 42	12.3	6.0	1.2	1.2	35	. .	950	. .	065	. .	35.7	74 45 33.2	. .	+ 3 45.9	125 55 40.3	− 7.4
16	22 34	12.8	9.4	6.0	2.3	35	. .	035	. .	045	. .	35.7	22 37 45.9	. .	+ 26.0	73 44 33.1	+ 3.4
17	76 10	18.2	11.8	6.3	5.5	37	. .	910	. .	915	. .	35.7	76 12 58.8	. .	+ 4 10.3	127 23 30.3	− 7.3
18	73 0	19.4	13.0	7.0	7.1	32	. .	000	. .	120	. .	35.7	73 4 27.2	. .	+ 3 23.1	124 14 11.5	− 6.6
19	5 52	11.9	8.5	4.5	0.6	36	. .	535	. .	570	. .	35.7	5 55 24.1	. .	+ 6.5	57 1 51.8	+ 2.5
20	73 48	13.3	7.4	1.3	3.0	36	. .	735	. .	815	. .	35.7	73 51 20.4	. .	+ 3 33.4	125 1 15.0	− 5.6
21	73 36	14.8	8.3	3.0	3.0	34	. .	900	. .	990	. .	35.7	73 39 47.4	. .	+ 3 30.9	124 49 39.5	− 5.5
22	76 14	12.9	6.7	1.8	1.0	39	. .	. .	. .	080	100	35.7	76 16 45.8	. .	+ 4 11.1	127 27 18.1	− 5.8
23	76 6	13.9	7.2	1.2	1.2	35	. .	340	. .	360	. .	35.7	76 9 42.6	. .	+ 4 10.0	127 20 13.8	− 5.6
24	73 4	15.2	8.3	4.1	2.8	32	. .	250	. .	360	. .	35.7	73 8 9.1	. .	+ 3 24.6	124 17 54.9	− 3.8
25	305 28	10.6	6.6	1.9	0.9	37	130	. .	185	. .	120	35.7	305 31 16.1	. .	− 1 27.8	356 36 9.5	+ 3.7
26	16 14	14.0	10.9	6.5	4.0	31	. .	230	. .	260	. .	35.7	16 18 42.8	. .	+ 18.4	67 25 22.4	+ 3.1
27	75 24	11.4	4.0	0.4	29.3	32	. .	. .	. .	840	890	35.7	75 28 22.9	. .	+ 3 58.6	126 38 42.7	− 3.4
28	75 24	11.4	4.0	0.4	29.3	34	. .	. .	. .	750	810	35.7	75 27 53.6	. .	+ 3 58.5	126 38 13.3	− 3.4
29	22 18	13.5	10.0	5.9	3.2	30	. .	460	. .	540	. .	35.7	22 22 54.9	. .	+ 25.9	73 29 42.0	+ 3.2
30	76 38	12.5	6.2	1.2	29.3	32	. .	315	. .	405	. .	35.7	76 42 29.4	. .	+ 4 21.1	127 53 11.7	− 3.0
31	55 20	15.3	10.8	5.5	4.8	30	. .	300	. .	310	. .	35.7	55 24 56.7	. .	+ 1 31.0	106 32 48.9	+ 1.0
32	311 36	11.5	7.7	4.0	2.1	32	. .	. .	380	. .	375	35.7	311 40 28.0	18.0	− 1 10.6	2 45 38.6	+ 1.8
33	73 58	12.5	5.5	1.6	29.8	39	. .	090	. .	100	. .	35.7	74 0 46.3	. .	+ 3 36.9	125 10 44.4	− 2.2
34	11 8	12.3	5.2	3.3	3.5	34	. .	920	. .	952	. .	34.8	11 11 48.2	20.2	+ 12.5	62 18 21.9	−16.7
35	28 30	18.2	12.8	8.2	12.3	30	. .	. .	. .	968	952	34.8	28 34 42.6	. .	+ 34.3	79 41 38.1	+ 0.5
36	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
37	358 58	12.0	5.6	3.8	2.9	32	. .	. .	. .	372	396	34.8	359 2 27.9	. .	− 1.1	50 8 48.0	−13.6
38	23 20	17.0	11.4	7.9	8.7	29	. .	. .	. .	548	554	34.8	23 25 5.5	22.8	+ 27.2	74 31 53.9	−12.8
39	54 58	3.7	26.9	24.2	26.0	35	. .	. .	. .	810	844	34.8	55 1 43.4	23.8	+ 1 29.2	106 9 33.8	. .
40	33 8	11.8	4.0	1.9	2.1	35	. .	. .	. .	944	952	34.8	33 11 34.1	. .	+ 40.6	84 18 35.9	+ 4.5
41	32 38	6.9	1.3	28.8	27.9	31	. .	260	. .	360	. .	34.8	32 42 48.5	. .	+ 39.8	83 49 49.5	+ 2.2
42	10 26	12.4	6.5	2.9	2.7	36	422	430	. .	. .	. .	34.8	10 29 25.2	. .	+ 11.5	61 35 57.9	+ 1.2
43	24 20	15.2	7.9	3.7	3.0	34	448	462	. .	. .	. .	34.8	24 23 53.9	28.0	+ 28.1	75 30 43.2	+ 1.0
44	74 22	11.7	2.9	28.9	29.8	34	. .	. .	. .	304	284	34.8	74 26 0.6	. .	+ 3 42.0	125 36 3.8	− 8.1
45	72 52	11.8	3.6	28.5	28.5	31	. .	412	. .	476	. .	34.8	72 56 44.3	. .	+ 3 22.1	124 6 27.6	− 7.6
46	74 36	15.6	7.2	1.2	2.0	32	894	900	. .	. .	. .	34.8	74 40 18.8	. .	+ 3 45.6	125 50 25.6	− 7.7
47	73 4	11.3	3.0	26.1	27.6	30	. .	. .	. .	838	818	34.8	73 8 55.0	. .	+ 3 24.7	124 18 40.9	− 7.4
48	19 56	12.5	7.0	3.7	1.5	37	. .	. .	. .	808	818	34.8	19 59 4.4	21.2	+ 22.8	71 5 48.4	+ 2.3
49	76 10	15.2	7.3	1.1	2.5	37	982	998	. .	. .	. .	34.8	76 13 0.1	. .	+ 4 11.4	127 23 32.7	− 7.4

No.	Barom.	At. Ther.
	in.	°
1	30.19	28.0
2	30.17	29.0
5	30.21	39.0
6	30.23	30.5
12	30.23	30.0
14	30.19	23.0
32	30.26	20.5
34	30.52	19.5
38	30.48	22.0
39	30.47	23.5
43	30.43	27.5
48	30.40	26.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
2	− 7.4	− 16 14.8	. .	− 16 22.2
3	− 7.3	+ 16 14.8	. .	+ 16 7.5
39	− 7.3	− 16 14.5	. .	− 16 21.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	CORRECTIONS. Inst.	Clock appar'nt.	Clock adopted.	Apparent Right Ascension.	Miscellan'us Corrections.
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Feb. 5	1	B. A. C. 1467	F.	. .	. .	. .	. .	. .	. .	44.6	46.2	49.3	38 34.99	− 0.17	. .	−14.47	4 38 20.35	− 0.78
	2	ι Aurigæ.	F.	. .	. .	1.6	4.0	6.6	9.0	11.5	. .	. .	49 6.54	− 0.23	−14.41	−14.46	4 48 51.85	− 0.09
	3	11 Orionis.	F.	28.4	30.9	32.5	. .	. .	. .	49.4	50.9	53.6	57 40.95	− 0.20	−14.46	−14.46	4 57 26.29	− 0.07
	4	B. A. C. 1573	F.	55.0	58.2	0.1	7.7	10.2	12.8	20.3	22.0	25.3	0 10.18	− 0.16	. .	−14.46	4 59 55.56	− 0.94
	5	β Orionis.	F.	35.0	37.5	39.0	45.2	47.2	49.3	55.5	57.0	59.0	8 47.26	− 0.18	−14.46	−14.46	5 8 32.62	0.00
	6	B. A. C. 1666	F.	51.2	54.5	1.2	3.7	6.2	8.8	11.2	18.0	21.0	16 6.20	− 0.16	. .	−14.46	5 15 51.58	− 0.99
	7	B. A. C. 1718	F.	12.9	15.8	7.5	24.7	27.2	29.7	36.9	38.7	41.9	23 27.26	− 0.16	. .	−14.46	5 23 12.64	− 0.99
	8	δ Orionis.	F.	40.4	43.0	44.5	50.6	52.6	54.8	0.9	2.4	5.0	25 52.69	− 0.18	−14.44	−14.46	5 25 38.05	− 0.05
	9	α Leporis	F.	15.6	18.3	19.9	26.4	28.6	30.7	37.0	38.6	41.3	27 28.49	− 0.17	−14.37	−14.46	5 27 13.86	− 0.13
	10	B. A. C. 1842	F.	16.6	19.8	22.0	29.8	32.4	35.0	43.0	45.0	48.3	41 32.43	− 0.16	. .	−14.45	5 41 17.82	− 1.16
	11	B. A. C. 1878	F.	33.8	36.9	38.8	46.3	48.8	51.4	59.0	0.9	3.9	46 48.87	− 0.16	. .	−14.45	5 46 34.26	− 1.12
	12	B. A. C. 1910	F.	40.0	43.0	44.9	52.0	54.5	56.9	3.9	5.8	8.9	51 54.43	− 0.16	. .	−14.45	5 51 39.82	− 1.08
	13	B. A. C. 1976	F.	34.5	37.5	39.4	46.9	49.4	51.9	59.3	1.0	3.9	2 49.31	− 0.16	. .	−14.45	6 2 34.70	− 1.15
	14	B. A. C. 1998	F.	8.0	11.5	13.5	21.5	24.2	26.9	35.0	37.0	40.2	6 24.20	− 0.16	. .	−14.45	6 6 9.59	− 1.25
	15	δ Ursæ Minoris, S. P.	F.	. .	. .	45.0	9.5	36.0	0.5	26.0	. .	. .	12 35.40	+ 1.73	. .	−14.46	18 12 22.67	+ 0.61
	16	B. A. C. 2077	F.	50.5	32.2	37.0	39.6	42.2	44.9	47.4	52.5	54.4	19 42.30	− 0.16	. .	−14.44	6 19 27.70	− 1.24
	17	B. A. C. 2122	F.	3.0	6.6	8.8	. .	. .	. .	29.9	32.2	35.5	25 19.33	− 0.16	. .	−14.44	6 25 4.73	− 1.30
	18	Brisbane 1256.	F.	. .	. .	. .	22.3	24.9	27.6	. .	. .	. .	25 24.93	− 0.16	. .	−14.44	6 25 10.33	− 1.31
	19	51 Cephei.	F.	. .	. .	. .	. .	56.0	39.0	22.0	. .	. .	41 56.46	− 2.41	. .	−14.46	6 41 39.59	+ 0.32
	20	B. A. C. 2282	F.	17.3	20.5	22.3	29.8	32.3	34.9	42.3	44.0	47.4	52 32.31	− 0.16	. .	−14.43	6 52 17.72	− 1.29
	21	α^2 Geminorum	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	22	α Canis Minoris	F.	49.0	51.6	53.0	59.1	1.3	3.4	9.5	11.0	13.6	33 1.28	− 0.19	−14.42	−14.46	7 32 46.63	− 0.20
	23	β Geminorum	F.	42.1	45.0	46.7	53.8	55.9	58.3	5.4	7.0	10.0	37 56.02	− 0.22	−14.37	−14.46	7 37 41.34	− 0.12
	24	B. A. C. 2604	F.	52.2	55.6	57.4	5.6	8.2	10.9	19.0	20.9	24.4	44 8.24	− 0.16	. .	−14.42	7 43 53.66	− 1.42
	25	φ Geminorum	F.	53.0	56.0	57.8	4.6	7.0	9.3	16.1	17.9	20.7	46 6.93	− 0.22	−14.46	−14.46	7 45 52.25	− 0.08
7	26	Venus, S.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	27	α Lyræ	E.	. .	43.6	45.6	50.9	. .	. .	. .	. .	. .	32 56.00	− 0.28	−14.66	−14.69	18 32 41.03	− 0.01
	28	α Aquilæ.	E.	. .	. .	50.7	52.8	54.9	57.0	59.2	. .	. .	44 54.92	− 0.33	−14.74	−14.70	19 44 39.89	+ 0.08
8	29	Sun I, S.	E.	59.4	2.0	3.4	9.9	12.0	14.1	20.5	22.0	24.7	27 12.00	− 0.37	. .	−14.72	21 26 56.91	. .
	30	Sun II, N.	E.	14.0	16.6	18.1	24.5	26.7	28.9	35.4	36.9	39.5	29 26.73	− 0.37	. .	−14.72	21 29 11.64	. .
	31	Mercury I, C.	E.	41.0	43.6	45.0	51.0	53.3	55.5	1.7	3.0	5.7	32 53.31	− 0.36	. .	−14.73	22 32 38.22	+ 0.21
9	32	B. A. C. 881	F.	38.2	40.7	42.4	48.7	50.9	52.8	59.2	0.8	3.4	44 50.79	− 0.22	. .	−15.18	2 44 35.39	+ 0.22
	33	B. A. C. 921	F.	6.1	9.0	10.5	17.0	19.3	21.6	28.0	29.5	32.2	52 19.24	− 0.22	. .	−15.18	2 52 3.84	+ 0.23
	34	α Ceti.	F.	47.9	50.4	52.2	58.0	0.3	2.3	8.4	10.0	12.4	56 0.21	− 0.23	−15.22	−15.16	2 55 44.82	+ 0.08
	35	B. A. C. 994	F.	26.9	29.4	30.9	. .	. .	. .	. .	. .	. .	6 39.11	− 0.24	. .	−15.18	3 6 23.69	− 0.03
	36	B. A. C. 1013	F.	48.9	51.4	52.9	59.2	1.2	3.4	9.5	11.2	13.7	10 1.27	− 0.25	. .	−15.18	3 9 45.84	− 0.10
	37	B. A. C. 1034	F.	3.0	5.7	7.3	13.9	16.1	18.3	24.9	26.4	29.2	14 16.09	− 0.22	. .	−15.18	3 14 0.69	+ 0.08
	38	B. A. C. 1052	F.	57.7	0.5	2.2	8.8	11.0	13.3	20.1	21.8	24.6	17 11.11	− 0.22	. .	−15.18	3 16 55.71	+ 0.17
	39	B. A. C. 1068	F.	26.8	29.3	30.9	37.2	39.2	41.3	47.6	49.0	51.7	20 39.22	− 0.23	. .	−15.18	3 20 23.81	− 0.04
	40	B. A. C. 1090	F.	. .	. .	36.4	38.5	40.5	42.6	44.6	. .	. .	24 40.52	− 0.24	. .	−15.18	3 24 25.10	− 0.15
	41	B. A. C. 1092	F.	53.4	56.0	57.4	3.6	5.7	7.8	14.0	15.6	18.2	26 5.74	− 0.23	. .	−15.18	3 25 50.33	− 0.07
	42	B. A. C. 1147	F.	29.3	32.2	33.8	40.5	42.8	45.1	51.8	53.4	56.2	37 42.79	− 0.22	. .	−15.18	3 37 27.39	− 0.07
	43	η Tauri	F.	5.5	8.2	10.0	16.5	18.9	21.0	27.9	29.5	32.3	40 18.87	− 0.22	−15.21	−15.17	3 40 3.48	+ 0.04
	44	γ^1 Eridani	F.	. .	23.4	25.4	27.7	29.8	31.8	36.0	37.7	40.3	52 27.61	− 0.25	−15.11	−15.17	3 52 12.19	− 0.02
	45	B. A. C. 1251	F.	33.8	36.4	37.9	44.0	46.0	48.0	54.3	55.8	58.3	56 46.06	− 0.23	. .	−15.18	3 56 30.65	− 0.27
	46	B. A. C. 1275	F.	8.9	10.0	14.3	16.4	18.6	20.6	22.7	27.0	28.5	2 18.56	− 0.22	. .	−15.18	4 2 3.16	− 0.28
	47	B. A. C. 1285	F.	44.5	47.0	48.6	54.7	56.8	58.8	5.0	6.5	9.0	4 56.77	− 0.23	. .	−15.18	4 4 41.36	− 0.32
	48	B. A. C. 1330	F.	1.2	2.8	7.0	9.0	11.1	13.3	15.4	19.6	21.0	13 11.16	− 0.22	. .	−15.18	4 12 55.76	− 0.34
	49	B. A. C. 1346	F.	46.6	49.2	50.9	57.3	59.4	1.4	8.0	9.6	12.2	15 59.40	− 0.22	. .	−15.18	4 15 44.00	− 0.35
	50	B. A. C. 1386	F.	8.0	10.7	12.2	18.3	20.3	22.3	28.5	30.0	32.6	22 20.32	− 0.23	. .	−15.18	4 22 4.91	− 0.44

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		V.	VI.	VII.	VIII.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	69 46	10 4.4	26.9	20.8	22.6	31	. .	. .	. .	300	316	34.8	69 50 53.5	. .	+ 2 49.6	121 0 4.3	− 6.1
2	5 52	11.3	7.7	3.2	0.6	36	. .	. .	. .	672	674	34.8	5 55 22.5	. .	+ 6.5	57 1 50.2	+ 0.9
3	23 36	10.1	5.7	1.1	29.3	36	618	670	. .	. .	. .	34.8	23 39 23.7	. .	+ 27.5	74 46 12.4	+ 1.3
4	74 26	10.3	3.8	27.3	28.2	36	. .	. .	. .	858	868	34.8	74 29 22.2	. .	+ 3 43.0	125 39 26.4	− 6.3
5	47 10	11.5	4.6	1.4	29.8	39	690	680	. .	. .	. .	34.8	47 13 22.6	. .	+ 1 7.8	98 20 51.6	+ 0.2
6	73 36	14 9	7.2	1.7	2.2	34	916	940	. .	. .	. .	34.8	73 39 47.0	. .	+ 3 31.4	124 49 39.6	− 5.6
7	71 18	14.5	6.8	2.7	2.5	34	330	324	. .	. .	. .	34.8	71 21 56.2	. .	+ 3 4.4	122 31 21.8	− 5.0
8	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
9	56 42	11.5	5.1	1.0	29.6	30	. .	682	. .	720	. .	34.8	56 46 54.6	20.8	+ 1 35.6	107 54 51.4	+ 2.3
10	78 6	10.3	2.1	26.2	28.8	31	. .	446	. .	472	. .	34.8	78 10 45.2	. .	+ 4 52.9	129 21 59.3	− 5.4
11	74 36	7.0	29.7	23.0	26.6	38	. .	674	. .	614	. .	34.8	74 38 58.0	. .	+ 3 45.4	125 49 4.6	− 4.7
12	70 12	12.0	4.3	29.3	0.5	38	. .	. .	. .	570	584	34.8	70 14 54.4	. .	+ 2 53.4	121 24 9.0	− 3.9
13	73 4	10.5	2.6	27.6	28.4	33	656	656	. .	. .	. .	34.8	73 8 10.8	. .	+ 3 24.6	124 17 56.6	− 4.0
14	79 4	11.0	2.7	26.7	27.6	33	. .	. .	. .	016	990	34.8	79 8 21.6	. .	+ 5 18.3	130 20 1.1	− 4.6
15	305 28	13.3	9.4	5.0	4.8	37	060	054	048	048	050	34.8	305 31 13.5	. .	− 1 27.7	356 36 7.0	+ 1.4
16	75 42	15.6	7.5	3.2	3.7	31	. .	. .	. .	526	548	34.8	75 46 38.6	. .	+ 4 3.6	126 57 3.4	− 3.7
17	79 2	11.9	4.4	29.8	0.2	34	. .	. .	. .	606	. .	34.8	79 5 55.2	. .	+ 5 17.2	130 17 33.6	− 3.8
18	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
19	311 36	7.9	4.4	29.2	29.0	32	. .	. .	656	652	646	34.8	311 40 26.6	. .	− 1 10.4	2 45 37.4	+ 0.9
20	73 58	13.6	4.9	0.5	0.1	39	014	030	. .	. .	. .	34.8	74 0 46.4	20.8	+ 3 36.3	125 10 43.9	− 2.4
21	6 40	9.1	3.4	29.1	28.7	35	. .	. .	. .	248	254	34.8	6 43 47.4	. .	+ 7.4	57 50 16.0	+ 0.8
22	33 16	10.0	5.1	1.9	0.7	32	. .	954	. .	970	. .	34.8	33 20 20.0	. .	+ 41.2	84 27 22.4	+ 1.8
23	10 30	13.5	9.8	4.3	4.1	34	860	852	. .	. .	. .	34.8	10 33 47.4	20.8	+ 11.7	61 40 20.3	+ 1.0
24	79 6	9.5	1.0	29.4	27.3	39	108	092	. .	. .	. .	34.8	79 8 47.8	. .	+ 5 18.1	130 20 27.1	+ 0.9
25	11 44	8.8	3.7	29.6	27.8	33	. .	982	. .	986	. .	34.8	11 48 6.4	. .	+ 13.1	62 54 40.7	+ 0.9
26	58 14	28.1	1.8	3.5	8.5	33	. .	. .	. .	575	680	33.7	58 18 10.2	10.5	+ 1 42.1	109 26 13.5	. .
27	0 10	14.5	8.2	6.7	3.2	34	. .	415	. .	435	. .	33.7	0 13 53.0	. .	+ 0.3	51 20 14.5	+ 0.2
28	30 16	17.4	12.6	9.8	8.4	30	. .	. .	. .	100	130	33.7	30 20 55.2	. .	+ 36.6	81 27 53.0	+ 1.7
29	54 2	12.8	4.8	3.4	4.2	35	085	110	. .	. .	. .	33.7	54 5 43.4	22.2	+ 1 25.0	105 13 29.6	. .
30	53 30	14.8	9.2	6.8	5.2	36	. .	. .	. .	930	880	33.7	53 33 14.5	. .	+ 1 23.3	104 40 59.0	. .
31	48 16	10.4	4.3	3.7	0.0	30	. .	250	. .	275	. .	33.7	48 21 0.0	. .	+ 1 9.3	99 28 30.5	. .
32	24 16	14.8	9.0	5.8	4.8	37	. .	. .	. .	354	352	35.0	24 19 9.1	. .	+ 29.3	75 25 59.6	+ 4.7
33	17 58	9 26.7	21.4	17.3	18.7	31	. .	830	. .	852	. .	35.0	18 2 50.8	. .	+ 21.1	69 9 33.1	+ 7.2
34	35 12	10 5.0	28.5	26.3	25.5	30	. .	774	. .	826	. .	35.0	35 16 58.8	6.5	+ 45.9	86 24 5.9	+ 0.1
35	40 28	7.9	0.6	29.3	28.1	31	930	946	. .	. .	. .	35.0	40 32 38.7	. .	+ 55.5	91 39 55.4	− 0.3
36	48 6	10.8	4.3	1.2	0.4	35	790	790	. .	. .	. .	35.0	48 9 36.6	. .	+ 1 12.4	99 17 10.2	− 2.7
37	18 8	5.9	1.0	28.9	27.4	36	. .	628	. .	660	. .	35.0	18 11 27.5	. .	+ 21.3	69 18 10.0	+ 7.7
38	14 32	8.4	0.6	0.8	28.7	32	766	782	. .	. .	. .	35.0	14 36 25.2	. .	+ 16.9	65 43 3.3	+ 9.1
39	29 32	12.7	6.6	5.2	3.5	37	. .	. .	. .	108	116	35.0	29 35 14.4	. .	+ 36.8	80 42 12.4	+ 3.8
40	44 18	3.8	26.2	25.1	24.7	31	. .	. .	. .	114	126	35.0	44 22 55.6	. .	+ 1 3.5	95 30 20.3	− 1.1
41	29 52	13.2	7.0	4.5	3.2	34	. .	. .	. .	140	132	35.0	29 56 0.0	. .	+ 37.4	81 2 58.6	+ 3.8
42	15 6	7.2	0.4	29.7	28.5	34	. .	162	. .	180	. .	35.0	15 10 4.7	. .	+ 17.6	66 16 43.5	+ 9.3
43	15 6	7.2	0.4	29.7	28.5	33	. .	. .	. .	762	776	35.0	15 10 11.3	. .	+ 17.6	66 16 50.1	+ 0.4
44	32 40	9.4	0.8	28.8	27.9	33	. .	. .	. .	740	724	35.0	52 44 11.2	. .	+ 1 25.2	103 51 57.6	− 0.2
45	33 10	6.6	0.7	28.8	28.0	32	. .	794	. .	806	. .	35.0	33 14 26.0	. .	+ 42.5	84 21 29.7	+ 3.2
46	25 46	6.6	0.5	28.4	27.2	38	. .	. .	. .	090	090	35.0	25 49 5.4	. .	+ 31.4	76 55 58.0	+ 5.9
47	33 38	4.5	28.1	26.1	26.3	38	. .	096	. .	114	. .	35.0	33 42 8.6	. .	+ 43.3	84 48 13.1	+ 3.2
48	25 6	7.2	1.2	28.5	27.2	37	. .	956	. .	982	. .	35.0	25 9 6.9	. .	+ 30.5	76 15 58.6	+ 6.2
49	21 34	6.0	1.3	29.4	28.2	33	. .	548	. .	548	. .	35.0	21 38 14.4	5.0	+ 25.8	72 45 1.4	+ 7.5
50	37 42	9.3	0.8	0.3	28.7	31	. .	. .	. .	950	960	35.0	37 46 38.0	. .	+ 50.3	88 53 49.5	+ 2.1

No.	Barom.	At. Ther.
	in.	°
9	30.39	25.0
20	30.37	24.0
23	30.36	24.5
26	29.94	12.0
29	29.92	20.0
34	30.44	10.5
49	30.37	7.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
26	− 12.7	. . .	− 14.2	− 26.9
29	− 7.2	− 16 15.3	. .	− 16 22.5
30	− 7.2	+ 16 15.3	. .	+ 16 8.1
31	− 5.9	− 0.7	. .	− 6.6

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Feb. 9	1	B. A. C. 1427 . .	F.	51.3	53.9	55.5	1.4	3.0	5.7	11.9	13.3	16.0	30 3.62	− 0.24	. .	−15.18	4 29 48.20	− 0.49
	2	B. A. C. 1431 . .	F.	50.8	53.3	54.9	1.0	3.0	5.2	11.4	12.9	15.4	31 3.10	− 0.23	. .	−15.18	4 30 47.69	− 0.48
	3	B. A. C. 1486 . .	F.	7.0	9.3	10.9	17.0	19.1	21.3	27.4	28.9	31.5	43 19.16	− 0.23	. .	−15.18	4 43 3.75	− 0.53
	4	B. A. C. 1515 . .	F.	54.4	57.0	58.0	4.8	6.9	8.9	15.3	16.8	19.0	48 6.92	− 0.22	. .	−15.18	4 47 51.52	− 0.55
	5	B. A. C. 1519 . .	F.	. .	. .	. .	. .	. .	. .	49.8	51.3	54.0	48 41.65	− 0.23	. .	−15.19	4 48 26.23	− 0.58
	6	B. A. C. 1568 . .	F.	6.8	9.5	11.0	17.5	19.7	21.9	28.5	30.0	32.7	0 19.73	− 0.22	. .	−15.19	5 0 4.32	− 0.63
	7	B. A. C. 1591 . .	F.	36.0	38.7	40.3	46.6	48.8	51.0	57.3	58.8	1.5	2 48.78	− 0.22	. .	−15.19	5 2 33.37	− 0.64
	8	B. A. C. 1611 . .	F.	49.3	51.8	53.3	59.5	1.5	3.4	9.7	11.3	13.7	7 1.50	− 0.23	. .	−15.19	5 6 46.08	− 0.67
	9	B. A. C. 1660 . .	F.	26.8	29.2	30.7	37.0	39.0	41.0	47.2	48.6	51.2	15 38.97	− 0.23	. .	−15.19	5 15 23.55	− 0.71
	10	B. A. C. 1717 . .	F.	. .	. .	. .	. .	. .	43.5	47.5	48.9	51.7	23 39.34	− 0.24	. .	−15.19	5 23 23.91	− 0.75
	11	B. A. C. 1726 . .	F.	56.4	59.1	0.0	5.0	7.0	9.1	. .	. .	. .	25 9.25	− 0.22	. .	−15.19	5 24 53.84	− 0.78
	12	α Orionis. . . .	F.	28.3	30.7	32.5	38.0	40.0	42.7	48.6	50.3	52.9	48 40.57	− 0.23	−15.19	−15.19	5 48 25.15	− 0.03
	13	δ Ursæ Minoris, S. P.	F.	. .	. .	46.5	12.0	38.0	2.5	. .	. .	. .	12 37.45	+ 0.82	. .	−15.19	18 12 23.08	0.00
	14	μ Geminorum . .	F.	27.0	29.9	31.5	38.0	40.4	42.7	49.3	50.9	53.7	15 40.38	− 0.22	−15.19	−15.19	6 15 24.97	− 0.04
11	15	ε Tauri	Sk.	22.0	25.3	26.0	33.2	35.5	37.6	44.0	45.0	48.4	21 35.46	− 0.44	−15.54	−15.53	4 21 19.49	0.00
	16	α Tauri	Sk.	48.7	51.4	52.0	59.2	1.3	3.5	9.8	11.4	14.3	29 1.39	− 0.45	−15.58	−15.53	4 28 45.41	+ 0.03
	17	B. A. C. 1486 . .	Sk.	. .	. .	15.8	17.9	20.0	22.0	24.0	. .	. .	43 19.94	− 0.48	. .	−15.56	4 43 3.90	− 0.51
	18	B. A. C. 1568 . .	Sk.	. .	. .	16.0	18.2	20.3	22.4	24.6	. .	. .	0 20.30	− 0.44	. .	−15.56	5 0 4.30	− 0.60
	19	B. A. C. 1611 . .	Sk.	50.0	52.4	54.0	0.1	2.1	4.1	10.3	12.0	14.5	7 2.17	− 0.50	. .	−15.56	5 6 46.11	− 0.64
	20	B. A. C. 1660 . .	Sk.	27.5	30.0	31.0	35.7	37.0	39.0	41.7	43.8	. .	15 39.70	− 0.51	. .	−15.56	5 15 23.63	− 0.69
	21	B. A. C. 1665 . .	Sk.	. .	. .	. .	. .	34.7	36.5	40.7	42.3	44.9	16 32.56	− 0.49	. .	−15.56	5 16 16.51	− 0.69
	22	B. A. C. 1762 . .	Sk.	23.7	26.3	27.0	34.0	36.0	38.1	44.3	45.8	48.3	29 36.04	− 0.53	. .	−15.55	5 29 19.96	− 0.76
	23	B. A. C. 1794 . .	Sk	31.7	34.2	35.8	41.7	43.9	46.0	52.0	53.6	56.3	34 43.91	− 0.52	. .	−15.55	5 34 27.84	− 0.78
	24	B. A. C. 1841 . .	Sk.	26.7	28.7	33.0	35.7	38.4	40.9	43.3	48.0	50.0	41 38.37	− 0.65	. .	−15.55	5 41 22.17	− 0.96
	25	B. A. C. 1922 . .	Sk.	8.7	11.7	13.7	21.1	23.7	26.2	33.0	35.4	38.7	53 23.64	− 0.67	. .	−15.55	5 53 7.42	− 1.03
	26	B. A. C. 1982 . .	Sk.	16.4	19.7	21.5	29.2	31.7	34.4	42.0	44.0	47.3	3 31.80	− 0.68	. .	−15.55	6 3 15.57	− 1.09
	27	B. A. C. 1996 . .	Sk.	6.5	9.4	11.4	18.9	21.4	24.0	31.2	33.1	36.3	6 21.36	− 0.67	. .	−15.55	6 6 5.14	− 1.07
	28	δ Ursæ Minoris, S. P.	Sk.	. .	. .	51.0	17.0	42.0	7.5	33.5	. .	. .	12 42.20	− 3.40	. .	−15.55	18 12 23.25	− 0.37
	29	B. A. C. 2098 . .	Sk.	47.0	50.8	53.0	1.1	4.0	6.7	14.4	16.7	20.2	22 3.83	− 0.70	. .	−15.55	6 21 47.58	− 1.21
	30	B. A. C. 2162 . .	Sk.	. .	. .	. .	. .	. .	. .	24.3	26.2	29.2	30 14.66	− 0.65	. .	−15.55	6 29 58.46	− 1.13
	31	B. A. C. 2202 . .	Sk.	11.0	14.5	16.4	24.0	27.4	30.0	38.0	40.0	43.3	37 27.24	− 0.70	. .	−15.54	6 37 11.00	− 1.24
	32	51 Cephei	Sk.	. .	. .	. .	. .	. .	14.0	39.5	11.0	5.0	41 49.66	+ 3.13	. .	−15.55	6 41 37.24	− 0.42
	33	B. A. C. 2456 . .	Sk.	. .	. .	14.0	16.3	18.7	21.0	23.4	. .	. .	19 18.68	− 0.64	. .	−15.54	7 19 2.50	− 1.22
	34	α² Geminorum . .	Sk.	40.5	43.5	45.2	52.3	54.9	57.2	4.3	6.2	9.3	26 54.82	− 0.38	−15.50	−15.56	7 26 38 88	+ 0.27
	35	α Canis Minoris .	Sk.	50.5	53.0	54.5	0.0	2.7	4.7	10.9	12.3	15.0	33 2.69	− 0.49	−15.55	−15.56	7 32 46.64	− 0.17
	36	β Geminorum . .	Sk.	43.5	46.3	48.1	55.0	57.3	59.5	6.4	8.2	11.3	37 57.29	− 0.40	−15.47	−15.56	7 37 41.33	− 0.12
	37	B. A. C. 2635 . .	Sk.	. .	. .	25.0	28.2	30.8	33.5	36.2	. .	. .	48 30.88	− 0.69	. .	−15.54	7 48 14.65	− 1.36
	38	B. A. C. 2671 . .	Sk.	5.7	9.0	11.0	18.6	21.4	24.2	31.9	33.8	37.2	55 21.42	− 0.69	. .	−15.54	7 55 5.19	− 1.37
	39	B. A. C. 2717 . .	Sk.	. .	. .	27.0	29.4	31.9	34.3	36.7	. .	. .	0 31.86	− 0.66	. .	−15.54	8 0 15.66	− 1.31
	40	Venus II, S. . .	E.	20.3	23.0	24.7	31.1	33.4	35.6	42.2	43.9	46.5	29 33.41	− 0.48	. .	−15.81	18 29 17.12	− 0.96
	41	Venus, N. . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	42	α Lyræ	E.	41.3	44.9	46.8	54.7	57.4	59.9	7.8	9.7	13.0	32 57.28	− 0.35	−15.70	−15.86	18 32 41.07	− 0.08
	43	β Lyræ	E.	28.2	31.3	33.0	40.4	42.9	15.4	52.0	54.5	57.5	45 42.87	− 0.36	−15.81	−15.86	18 45 26.65	− 0.02
	44	B. A. C. 6491 . .	E.	16.4	19.4	21.3	28.5	31.0	33.4	40.5	42.4	45.5	54 30.93	− 0.36	. .	−15.81	18 54 14.76	+ 1.24
	45	ζ Aquilæ	E.	. .	. .	50.9	53.0	55.1	57.2	59.4	. .	. .	59 55.12	− 0.40	−15.87	−15.85	18 59 38.87	+ 0.10
	46	δ Draconis . . .	E.	12.0	18.7	22.7	38.5	43.8	49.4	5.2	8.9	15.9	12 43.90	− 0.21	. .	−15.85	19 12 27.84	− 0.17
	47	δ Aquilæ	E.	. .	. .	23.0	25.0	27.0	29.0	31.1	. .	. .	19 27.02	− 0.43	−15.90	−15.85	19 19 10.74	+ 0.10
	48	B. A. C. 6690 . .	E.	42.0	44.8	46.6	53.4	55.7	57.9	4.9	6.6	9.5	25 55.71	− 0.37	. .	−15.81	19 25 39.53	+ 1.32
	49	γ Aquilæ	E.	21.7	24.4	25.9	32.3	34.3	36.3	42.0	44.1	46.7	40 34.26	− 0.41	−15.97	−15.85	19 40 18.00	+ 0.15
	50	α Aquilæ	E.	43.8	46.5	47.8	54.1	56.2	58.4	4.0	6.0	8.0	44 56.22	− 0.42	−15.87	−15.85	19 44 39.95	+ 0.06

28. Bisections at wires F_1, B_2, and B_3.
32. Bisections at wires D , D_2, and D_3.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan's Corrections.
		V.	VI.	VII.	VIII.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	42 42	10 9.7	2.8	0.5	0.2	38	974	000	. .	. .	. .	35.0	42 44 48.6	. .	+ 1 0.1	93 52 9.9	+ 0.6
2	38 4	9 10.3	4.2	1.9	1.0	35	. .	. .	. .	384	424	35.0	38 8 13.1	. .	+ 51.1	89 15 25.4	+ 2.1
3	32 4	10 8.4	2.0	29.8	27.7	32	. .	722	. .	740	. .	35.0	32 8 26.1	. .	+ 41.0	83 15 28.3	+ 4.2
4	27 36	3.1	27.6	24.0	25.1	35	508	502	. .	. .	. .	35.0	27 39 47.9	3.3	+ 34.2	78 46 43.3	+ 5.6
5	38 34	6.0	29.0	27.1	26.0	38	. .	. .	. .	740	716	35.0	38 36 57.0	3.3	+ 52.1	89 44 10.3	+ 2.1
6	20 20	11.0	6.1	3.8	1.4	31	840	856	. .	. .	. .	35.0	20 24 35.9	. .	+ 24.3	71 31 21.4	+ 8.0
7	23 22	11.8	5.7	2.5	1.6	30	. .	610	. .	620	. .	35.0	23 26 55.1	. .	+ 28.3	74 33 44.6	+ 7.0
8	36 6	4.9	27.2	25.8	25.0	34	. .	010	. .	012	. .	35.0	36 10 10.2	. .	+ 47.7	87 17 19.1	+ 3.0
9	39 20	5.2	28.5	27.5	26.5	37	. .	. .	. .	922	896	35.0	39 23 9.7	. .	+ 53.6	90 30 24.5	+ 2.1
10	40 0	7.2	1.0	29.5	28.5	33	. .	. .	. .	424	444	35.0	40 4 16.1	. .	+ 54.9	91 11 32.2	+ 2.0
11	20 20	12.7	6.7	5.0	3.2	37	. .	. .	. .	356	404	35.0	20 23 10.5	. .	+ 24.3	71 29 56.0	+ 7.8
12	31 26	6.8	2.0	0.6	28.3	34	. .	. .	. .	244	258	35.0	31 30 3.3	. .	+ 40.1	82 37 4.6	+ 4.0
13	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
14	16 14	9.0	4.4	2.9	0.5	31	. .	. .	. .	612	636	35.0	16 18 41.4	2.0	+ 19.2	67 25 21.8	+ 2.6
15	19 56	9.0	4.3	3.9	26.5	37	710	750	. .	. .	. .	32.6	19 59 5.6	. .	+ 21.8	71 5 48.6	+ 2.3
16	22 34	9.0	3.7	1.3	25.4	35	. .	. .	. .	130	. .	32.6	22 37 47.0	34.2	+ 24.9	73 44 33.1	+ 3.2
17	32 4	10.5	4.3	0.4	26.0	32	. .	150	. .	200	. .	32.6	32 8 31.5	. .	+ 37.6	83 15 30.3	+ 4.1
18	20 20	10.5	3.8	1.9	26.2	31	. .	. .	. .	668	708	32.6	20 24 39.1	. .	+ 22.3	71 31 22.6	+ 8.0
19	36 6	9.0	3.4	1.9	24.8	33	. .	274	. .	298	. .	32.6	36 10 15.0	. .	+ 43.8	87 17 20.0	+ 2.9
20	39 20	11.5	4.5	2.6	27.5	36	860	936	. .	. .	. .	32.6	39 23 17.6	. .	+ 49.1	90 30 27.9	+ 2.0
21	35 24	9.1	2.0	28.9	23.6	35	. .	. .	. .	934	. .	32.6	35 27 36.1	. .	+ 42.7	86 34 40.0	+ 3.2
22	44 48	10.5	2.0	0.5	24.5	33	. .	136	. .	218	. .	32.6	44 52 17.0	. .	+ 59.6	95 59 37.8	+ 0.5
23	40 50	11.4	3.5	3.9	26.4	36	. .	588	. .	530	. .	32.6	40 53 23.3	. .	+ 51.9	92 0 36.4	+ 1.7
24	71 8	11.0	2.5	29.2	25.2	33	. .	. .	. .	668	730	32.6	71 12 8.9	. .	+ 2 54.6	122 21 24.7	− 5.3
25	74 4	10.5	2.2	28.8	26.0	33	. .	692	. .	725	. .	32.6	74 8 8.5	. .	+ 3 28.4	125 17 58.1	− 5.4
26	76 0	10.8	1.5	28.1	24.9	34	320	360	. .	. .	. .	32.6	76 3 59.1	. .	+ 3 57.8	127 14 18.1	− 5.4
27	73 34	13.8	5.8	3.0	27.7	34	. .	554	. .	698	. .	32.6	73 37 51.4	. .	+ 3 21.9	124 47 34.5	− 5.0
28	305 28	7.8	2.2	29.3	21.6	37	720	710	740	. .	. .	32.6	305 31 8.0	. .	− 1 24.0	356 36 5.2	+ 1.1
29	79 38	10.3	3.4	29.0	25.5	32	. .	. .	. .	334	420	32.6	79 42 29.0	32.2	+ 5 20.5	130 54 10.7	− 5.3
30	71 24	7.6	1.5	28.5	24.8	34	. .	. .	. .	880	924	32.6	71 27 51.9	. .	+ 2 57.8	122 37 10.9	− 4.0
31	78 56	11.1	3.5	28.5	25.6	31	. .	932	. .	940	. .	32.6	79 2 35.5	. .	+ 5 2.5	130 13 59.2	− 4.7
32	311 36	6.3	29.3	25.8	22.9	32	. .	. .	802	780	842	32.6	311 40 27.3	. .	− 1 7.6	2 45 40.9	+ 6.0
33	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
34	6 40	9.3	4.0	29.1	26.2	35	. .	. .	. .	070	070	32.6	6 43 48.4	. .	+ 7.1	57 50 16.7	+ 1.9
35	33 16	8.3	4.3	29.3	26.8	32	828	782	. .	. .	. .	32.6	33 20 22.2	. .	+ 39.8	84 27 23.2	+ 2.2
36	10 30	9.8	4.3	28.3	27.6	35	. .	020	. .	020	. .	32.6	10 33 48.4	. .	+ 11.3	61 40 20.9	+ 2.0
37	77 18	10.8	3.5	23.5	26.2	35	. .	. .	. .	338	368	32.6	77 21 44.5	. .	+ 4 24.8	128 32 30.5	− 2.4
38	77 42	11.0	3.6	26.2	27.0	32	. .	. .	. .	640	626	32.6	77 46 25.2	. .	+ 4 33.6	128 57 20.0	− 2.2
39	72 2	8.3	2.1	29.5	25.6	39	. .	. .	. .	020	120	32.6	72 4 47.3	28.0	+ 3 5.9	123 14 14.4	− 1.9
40	58 24	6.9	0.7	0.2	25.5	35	310	. .	. .	. .	365	32.7	58 27 44.8	. .	+ 1 40.1	109 35 46.1	. . .
41	58 24	6.9	0.7	0.2	25.5	37	. .	140	. .	145	. .	32.7	58 27 17.3	. .	+ 1 40.1	109 35 18.6	. .
42	0 10	9.5	6.8	3.6	28.9	34	. .	470	. .	530	. .	32.7	0 13 54.3	25.5	+ 0.2	51 20 15.7	+ 0.5
43	5 36	3.5	29.0	27.2	23.3	31	. .	500	. .	520	. .	32.7	5 40 46.4	. .	+ 6.1	56 47 13.7	+ 0.8
44	6 18	6.8	2.0	0.3	27.0	31	. .	315	. .	345	. .	32.7	6 22 45.9	. .	+ 6.9	57 29 14.0	−20.2
45	25 8	5.7	29.8	29.2	24.1	31	. .	560	. .	620	. .	32.7	25 12 43.6	. .	+ 28.9	76 19 33.7	+ 2.4
46	331 24	6.5	1.8	0.0	26.0	34	. .	035	. .	050	. .	32.7	331 28 5.4	. .	− 33.4	22 33 53.2	+ 2.1
47	35 56	9.0	3.1	2.2	26.3	29	. .	. .	. .	790	770	32.7	36 1 8.7	. .	+ 44.6	87 8 14.5	+ 2.4
48	11 8	5.8	1.6	29.8	25.2	34	. .	870	. .	930	. .	32.7	11 11 52.1	. .	+ 12.1	62 18 25.4	−18.2
49	28 30	14.1	9.0	5.5	1.7	30	. .	820	. .	880	. .	32.7	28 34 47.1	. .	+ 33.4	79 41 41.7	+ 3.1
50	30 16	9.0	4.5	1.7	26.5	30	. .	460	. .	500	. .	32.7	30 20 57.4	. .	+ 35.8	81 27 54.4	+ 2.6

Nō.	Barom.	At. Ther.
	in.	°
4	30.39	8.0
5	30.39	8.0
14	30.45	7.0
16	29.79	32.2
29	29.82	31.4
39	29.86	29.0
42	30.10	23.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
40	− 12.2	− 13.8	. .	− 26.0
41	− 12.2	+ 13.8	− 0.1	+ 1.5

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Feb. 11	1	B. A. C. 7022	E.	43.0	46.3	48.3	56.4	59.0	1.6	9.6	11.6	14.9	17 58.97	− 0.34	. .	−15.82	20 17 42.81	+ 1.83
12	2	B. A. C. 1892	E.	38.2	41.5	43.5	51.4	54.0	56 5	4.3	6.2	9.5	48 53.90	− 0.54	. .	−15.83	5 48 37.53	− 1.04
	3	B. A. C. 1910	E.	41.9	44.7	46.4	53.5	55.9	58.5	5.5	7.1	10.5	51 56.00	− 0.51	. .	−15.83	5 51 39.66	− 0.97
	4	B. A. C. 1982	E.	16.6	19.7	21.6	29.3	32.0	34.6	42.3	44.0	47.4	3 31.94	− 0.53	. .	−15.83	6 3 15.58	− 1.07
	5	δ Ursæ Minoris, S.P.	E.	. .	51.0	15.0	13.0	. .	32.0	24.0	59.0	. .	12 41.95	− 1.77	. .	−15.85	18 12 24.33	+ 0.47
	6	μ Geminorum	E.	27.8	30.6	32.2	39.0	41.1	43.3	50.0	51.6	54.6	15 41.13	− 0.38	−15.81	−15.85	6 15 24.90	− 0.08
	7	γ Geminorum	E.	34.0	36.6	38.2	44.6	46.7	48.8	55.3	56.7	59.5	30 46.71	− 0.40	−15.79	−15.85	6 30 30.46	− 0.09
	8	B. A. C. 2194	E.	8.2	11.3	12.8	29.5	31.8	34.1	40.9	42.5	45.5	36 31.84	− 0.38	. .	−15.84	6 36 15.62	− 1.20
	9	α Canis Majoris	E.	43.0	45.5	47.2	53.5	55.7	57.8	4.0	5.8	8.5	39 55.67	− 0.47	−15.95	−15.85	6 39 39.35	+ 0.02
	10	51 Cephei	E	. .	. .	. .	. .	35.0	17.5	42.0	13.5	6.0	41 52.22	+ 1.28	. .	−15.85	6 41 37.65	+ 0.25
	11	ε Canis Majoris	E.	46.5	49.5	51.1	58.0	0.3	2.7	0.5	11.3	14.4	54 0.37	− 0.50	−15.89	−15.85	6 53 44.02	− 0.01
	12	δ Canis Majoris	E.	22.5	25.3	26.9	33.5	55.8	38.1	45.3	46.9	49.8	3 36.01	− 0.50	−15.81	−15.84	7 3 19.67	− 0.08
	13	δ Geminorum	E.	43.8	46.5	48.0	52.5	54.6	. .	. .	7.3	10.2	12 56.91	− 0.39	−15.81	−15.84	7 12 40.68	− 0.09
	14	ζ Cygni	E.	37.4	40.2	42.0	49.2	51.4	53.8	1.0	2.7	5.5	7 51.47	− 0.39	−15.74	−15.62	21 7 35.46	+ 0.13
	15	α Cephei	E.	22.0	27.4	30.5	13.7	. .	52.5	5.6	8.9	14.1	15 48.09	− 0.14	. .	−15.62	21 15 32.33	+ 0.16
13	16	Sun I, S.	F.	44.9	47.6	49.0	55.3	57.5	59.5	5.6	7.4	10.2	46 57.44	− 0.55	. .	−15.62	21 46 41.27	. .
	17	Sun II, N.	F.	58.8	1.3	3.0	9.0	11.2	13.4	19.6	21.3	23.9	49 11.25	− 0.55	. .	−15.62	21 48 55.11	. .
	18	B. A. C. 7923	F.	8.7	12.0	13.8	20.8	22.9	25.4	32.4	34.0	37.0	37 23.00	− 0.39	. .	−15.61	22 37 7.00	+ 1.64
	19	B. A. C. 8032	F.	43.6	46.5	48.2	55.1	57.4	59.7	6.6	8.5	11.2	57 57.42	− 0.40	. .	−15.61	22 57 41.41	+ 1.55
	20	α Pegasi	F.	. .	. .	. .	. .	. .	51.1	55.3	57.0	59.0	58 46.90	− 0.45	−15.60	−15.61	22 58 30.84	+ 0.02
	21	B. A. C. 881	F.	. .	. .	17.0	19.3	51.4	53.5	55.6	. .	. .	44 51.36	− 0.50	. .	−15.50	2 44 35.36	+ 0.28
	22	B. A. C. 921	F.	. .	. .	15.4	17.6	19.7	. .	28.4	30.0	32.8	52 19.70	− 0.48	. .	−15.50	2 52 3.72	+ 0.29
	23	B. A. C. 994	F.	27.5	30.0	31.6	37.8	39.8	41.8	48.0	49.5	52.0	6 39.78	− 0.55	. .	−15.51	3 6 23.72	+ 0.03
	24	ζ Arietis	F.	45.9	48.6	50.1	56.7	59.0	1.2	7.7	9.3	12.0	7 58.94	− 0.48	−15.54	−15.57	3 7 42.89	− 0.07
	25	B. A. C. 1013	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	26	B. A. C. 1034	F.	3.6	6.4	8.0	14.5	16.7	18.9	25.3	27.0	29.8	14 16.69	− 0.48	. .	−15.51	3 14 0.70	+ 0.14
	27	B. A. C. 1068	F.	. .	. .	35.8	37.7	39.8	41.9	43.9	. .	. .	20 39.82	− 0.52	. .	−15.52	3 20 23.78	+ 0.02
	28	B. A. C. 1090	F.	28.8	31.5	33.0	39.1	41.3	43.3	49.5	50.9	53.6	24 41.22	− 0.56	. .	−15.52	3 24 25.14	− 0.09
	29	B. A. C. 1134	F.	31.2	33.7	35.2	41.2	43.3	45.3	51.6	53.0	55.8	34 43.37	− 0.56	. .	−15.52	3 34 27.29	− 0.15
	30	B. A. C. 1147	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	31	η Tauri	F.	6.0	8.8	10.4	17.0	19.3	21.7	28.2	29.9	32.8	40 19.34	− 0.47	−15.49	−15.56	3 40 3.31	− 0.07
	32	ζ Persei	F.	18.1	21.3	23.0	30.2	32.7	35.2	42.2	44.0	47.1	46 32.64	− 0.44	−15.53	−15.56	3 46 16.64	− 0.04
	33	B. A. C. 1216	F.	5.0	7.5	9.0	15.2	17.2	19.3	25.5	27.0	29.5	48 17.24	− 0.56	. .	−15.53	3 48 1.15	− 0.21
	34	B. A. C. 1251	F.	34.4	37.0	38.5	44.6	46.7	48.7	55.0	56.5	59.1	56 46.72	− 0.53	. .	−15.53	3 56 30.66	− 0.22
	35	B. A. C. 1275	F.	6.6	9.2	10.7	17.0	19.2	21.2	27.6	29.0	31.7	2 19.13	− 0.50	. .	−15.53	4 2 3.10	− 0.22
	36	B. A. C. 1285	F.	. .	. .	53.4	55.5	57.5	59.5	1.6	. .	. .	4 57.50	− 0.53	. .	−15.53	4 4 41.44	− 0.26
	37	Moon I, S.	F.	44.3	47.3	49.0	56.0	58.2	0.5	7.4	9.2	12.0	7 58.21	− 0.47	. .	−15.53	4 7 42.21	+74.02
	38	B. A. C. 1330	F.	59.1	1.7	3.3	9.6	11.9	13.9	20.2	21.7	24.3	13 11.74	− 0.50	. .	−15.53	4 12 55.71	− 0.28
	39	B. A. C. 1346	F.	47.0	49.7	51.4	57.9	59.9	2.1	8.5	10.0	12.7	15 59.91	− 0.49	. .	−15.53	4 15 43.89	− 0.29
	40	B. A. C. 1386	F.	8.7	11.4	12.8	18.9	21.0	23.0	29.3	30.7	33.4	22 21.02	− 0.54	. .	−15.54	4 22 4.94	− 0.38
	41	α Tauri	F.	48.5	51.2	52.8	59.2	1.4	3.5	9.9	11.5	14.2	29 1.36	− 0.49	−15.54	−15.55	4 28 45.32	− 0.03
	42	B. A. C. 1427	F.	51.9	54.7	56.0	2.3	4.3	6.4	12.6	14.0	16.6	30 4.31	− 0.56	. .	−15.54	4 29 48.21	− 0.44
	43	B. A. C. 1431	F.	. .	. .	59.5	1.5	3.8	5.8	7.8	. .	. .	31 3.68	− 0.54	. .	−15.54	4 30 47.60	− 0.43
	44	B. A. C. 1449	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	45	B. A. C. 1486	F.	7.6	10.1	11.6	17.8	19.8	22.0	28.0	29.5	32.2	43 19.84	− 0.52	. .	−15.54	4 43 3.78	− 0.48
	46	B. A. C. 1493	F.	. .	. .	15.9	18.1	20.3	22.3	24.6	. .	. .	44 20.24	− 0.49	. .	−15.54	4 44 4.21	− 0.47
	47	B. A. C. 1515	F.	. .	. .	3.4	5.4	7.5	9.6	11.7	. .	. .	48 7.52	− 0.50	. .	−15.55	4 47 51.47	− 0.50
	48	11 Orionis	F.	29.4	32.2	33.9	40.3	42.2	44.3	50.7	52.1	54.9	57 42.22	− 0.50	−15.53	−15.55	4 57 26.17	− 0.09
	49	B. A. C. 1591	F.	39.2	41.0	45.0	47.2	49.4	51.4	53.6	57.8	59.3	2 49.32	− 0.50	. .	−15.55	5 2 33.27	− 0.59
	50	B. A. C. 1611	F.	49.8	52.5	54.0	0.1	2.0	4.0	10.1	11.8	14.4	7 2.08	− 0.54	. .	−15.55	5 6 45.99	− 0.62

21. Microscope III reduced for 1″.7.
37, 42, 46, 47. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	358 58	10 6.4	2.8	0.3	24.7	32	. .	430	. .	435	. .	32.7	359 2 29.6	30.0	— 1.0	50 8 49.8	—15.5
2	77 18	13.0	5.0	2.0	28.8	31	. .	. .	. .	840	890	32.5	77 22 34.0	. .	+ 4 27.3	128 33 22.5	— 6.2
3	70 12	13.2	6.0	0.6	29.5	38	. .	. .	. .	090	140	32.5	70 14 58.3	28.0	+ 2 48.5	121 24 8.0	— 5.0
4	76 0	15.5	8.0	1.5	1.0	34	. .	210	. .	120	. .	32.5	76 3 56.9	. .	+ 4 1.7	127 14 19.8	— 5.6
5	305 28	11.3	5.9	0.5	0.2	37	370	. .	. .	. .	390	32.5	305 31 9.8	. .	— 1 25.4	356 36 5.6	+ 1.7
6	16 14	12.1	7.8	3.7	29.0	31	. .	. .	. .	285	265	32.5	16 18 42.8	. .	+ 17.9	67 25 21.9	+ 2.8
7	22 18	8.2	3.0	0.5	26.5	30	. .	745	. .	725	. .	32.5	22 22 54.2	. .	+ 25.1	73 29 40.5	+ 1.7
8	13 34	9.7	4.7	1.4	27.3	33	. .	750	. .	785	. .	32.5	13 38 6.6	. .	+ 14.8	64 44 42.6	+ 8.2
9	55 20	14.0	7.2	4.2	0.0	29	. .	. .	. .	995	015	32.5	55 25 1.1	. .	+ 1 28.4	106 32 50.7	+ 1.6
10	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
11	67 36	10.1	3.6	28.0	28.0	36	. .	460	. .	430	. .	32.5	67 39 26.1	. .	+ 2 27.7	118 48 15.0	+ 0.2
12	64 58	11.6	4.5	2.5	29.0	29	. .	. .	. .	100	040	32.5	65 3 17.3	. .	+ 2 10.7	116 11 49.2	+ 2.3
13	16 36	11.0	5.8	2.0	27.3	31	630	600	. .	. .	. .	32.5	16 40 38.5	27.0	+ 18.3	67 47 18.0	+ 2.6
14	9 6	8.0	1.3	0.2	27.8	31	. .	192	. .	198	. .	31.4	9 10 46.4	. .	+ 9.7	60 17 17.3	+ 0.1
15	336 46	3.7	25.0	20.4	27.6	31	. .	. .	. .	030	054	31.4	336 50 55.1	36.5	— 25.7	27 56 50.6	+ 2.7
16	52 24	13.8	9.0	3.0	0.5	35	790	806	. .	. .	. .	31.4	52 27 30.1	35.0	+ 1 18.2	103 35 9.5	. .
17	51 52	11.2	5.3	1.0	27.2	37	. .	. .	. .	666	680	31.4	51 55 5.8	. .	+ 1 16.8	103 2 43.8	. .
18	9 16	10.2	4.1	29.7	25.9	36	. .	. .	. .	118	142	31.4	9 19 30.6	. .	+ 9.8	60 26 1.6	— 5.5
19	11 26	8.6	2.4	27.9	25.6	37	340	336	. .	. .	. .	31.4	11 29 12.8	. .	+ 12.1	62 35 46.1	— 4.3
20	24 18	6.2	0.2	26.4	22.4	37	. . .	. .	. .	000	018	31.4	24 21 20.7	39.2	+ 27.0	75 28 8 9	+ 2.8
21	24 16	11.6	3.1	26.7	28.3	36	. .	. .	. .	376	390	33.1	24 19 11.8	. .	+ 27.3	75 26 0.3	+ 4.5
22	17 58	9.8	1.0	26.3	24.0	30	. .	874	. .	906	. .	33.1	18 2 54.3	. .	+ 19.7	69 9 35.2	+ 7.0
23	40 28	12.2	2.2	25.7	27.8	31	440	416	. .	. .	. .	33.1	40 32 43.9	. .	+ 51.7	91 39 56.8	— 0.4
24	18 14	6.0	29.8	24.1	23.8	32	816	790	. .	. .	. .	33.1	18 18 26.6	. .	+ 20.0	69 25 7.8	+ 3.3
25	48 6	17.5	10.0	1.0	2.5	35	018	992	. .	. .	. .	33.1	48 9 43.3	. .	+ 1 7.5	99 17 12.0	— 2.8
26	18 8	15.8	8.2	4.8	1.4	35	. .	850	. .	. .	. .	33.1	18 11 30.8	. .	+ 19.9	69 18 11.9	+ 7.6
27	29 32	15.5	6.8	1.4	0.4	36	. .	. .	. .	736	750	33.1	29 35 18.9	. .	+ 34.3	80 42 14.4	+ 3.7
28	44 18	22.0	11.2	6.6	2.8	29	. .	. .	. .	766	790	33.1	44 23 1.1	32.9	+ 59.2	95 30 21.5	— 1.3
29	44 26	9.0	0.7	23.5	23.8	35	766	778	. .	. .	. .	33.1	44 29 40.0	. .	+ 59.4	95 37 0.6	— 1.1
30	15 6	13.4	4.2	28.0	28.9	33	. .	. .	. .	624	650	33.1	15 10 9.3	. .	+ 16.4	66 16 46.9	+ 9.2
31	15 6	13.4	4.2	28.0	28.9	33	200	220	. .	. .	. .	33.1	15 10 15.2	. .	+ 16.4	66 16 52.8	+ 2.9
32	7 18	14.3	8.0	1.7	1.7	31	. .	. .	. .	176	182	33.1	7 22 44.2	. .	+ 7.8	58 29 13.2	+ 3.1
33	42 8	9.5	0.6	26.9	25.4	33	. .	. .	. .	284	296	33.1	42 12 17.4	. .	+ 54.9	93 19 33.5	— 0.1
34	33 10	9.2	2.9	24.0	26.0	32	. .	400	. .	410	. .	33.1	33 14 30.7	. .	+ 39.7	84 21 31.6	+ 3.1
35	25 46	9.7	2.2	24.5	26.7	37	494	506	. .	. .	. .	33.1	25 49 12.2	. .	+ 29.3	76 56 2.7	+ 5.8
36	33 33	14.0	7.3	0.1	28.5	37	. .	. .	. .	270	278	33.1	33 41 11.7	. .	+ 40.4	84 48 13.3	+ 3.1
37	14 34	11.2	4.6	27.3	28.3	29	968	. .	012	. .	104	33.1	14 39 20.0	. .	+ 15.9	65 45 57.1	. .
38	25 6	9.0	2.8	25.2	25.0	37	. .	. .	. .	702	716	33.1	25 9 10.0	. .	+ 28.5	76 15 59.7	+ 6.1
39	21 34	8.4	2.0	26.5	25.2	33	. .	. .	. .	116	150	33.1	21 38 20.0	. .	+ 24.0	72 45 5.2	+ 7.4
40	37 42	12.5	2.8	28.6	27.2	31	. .	164	. .	194	. .	33.1	37 46 47.2	31.3	+ 47.0	88 53 55.4	+ 1.9
41	22 34	10.6	2.8	29.0	26.2	35	198	184	. .	. .	. .	33.1	22 37 46.2	. .	+ 25.3	73 44 32.7	+ 2.8
42	42 42	11.3	3.9	26.7	27.9	38	698	. .	. .	. .	704	33.1	42 44 52.4	. .	+ 56.0	93 52 9.6	+ 0.4
43	38 4	10.1	2.7	27.1	26.5	33	. .	. .	. .	360	362	33.1	38 8 15.3	. .	+ 47.6	89 15 24.1	+ 1.9
44	16 6	3.8	29.4	18.8	22.4	33	. .	. .	. .	394	390	33.1	16 10 20.6	. .	+ 17.6	67 16 59.4	+ 9.4
45	32 4	11.0	2.3	24.5	25.6	32	282	272	. .	. .	. .	33.1	32 8 32.1	. .	+ 38.2	83 15 31.5	+ 4.0
46	20 12	11.4	2.9	26.9	27.4	35	. .	. .	. .	662	650	33.1	20 15 39.4	. .	+ 22.5	71 22 23.1	+ 8.0
47	27 36	10.7	3.8	27.8	27.6	34	. .	. .	. .	786	804	33.1	27 39 52.3	. .	+ 31.9	78 46 45.4	+ 5.5
48	23 36	10.2	4.0	27.4	27.1	36	. .	506	. .	516	. .	33.1	23 39 26.3	. .	+ 26.7	74 46 14.2	+ 2.9
49	23 22	15.5	7.2	0.9	29.3	30	152	140	. .	. .	. .	33.1	23 26 59.9	. .	+ 26.4	74 33 47.5	+ 7.0
50	36 6	10.0	1.1	25.5	24.7	33	308	320	. .	. .	. .	33.1	36 10 16.7	29.5	+ 44.5	87 17 22.4	+ 2.8

No.	Barom.	At. Ther
	in.	°
1	30.12	27.0
3	30.00	29.5
13	29.98	28.5
15	30.07	31.5
16	30.05	32.8
20	30.05	36.0
28	30.06	35.5
40	30.03	34.5
50	30.04	33.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
16	— 7.1	— 16 12.8	. .	— 16 19.9
17	— 7.0	+ 16 12.8	. .	+ 16 5.8
37	—14 43.6	— 16 6.5	. .	— 30 50.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Feb. 13	1	B. A. C. 1660	F.	27.4	30.0	31.5	37.7	39.7	41.8	47.9	49.4	52.0	15 39.71	− 0.54	. .	−15.55	5 15 23.62	− 0.66
	2	B. A. C. 1665	F.	. .	. .	. .	. .	. .	36.8	40.9	42.3	44.9	16 32.63	− 0.53	. .	−15.55	5 16 16.55	− 0.66
	3	B. A. C. 1717	F.	27.6	30.3	31.8	. .	. .	. .	48.1	49.7	52.4	23 39.98	− 0.55	. .	−15.56	5 23 23.87	− 0.70
	4	B. A. C. 1726	F.	56.8	59.5	1.2	7.7	9.8	12.0	18.5	20.0	22.7	25 9.80	− 0.49	. .	−15.56	5 24 53.75	− 0.73
	5	B. A. C. 1742	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	6	B. A. C. 1767	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	7	B. A. C. 1794	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	8	B. A. C. 1806	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	9	δ Ursæ Minoris, S. P.	F.	. .	. .	50.0	16.5	43.0	8.0	34.0	. .	. .	12 42.30	− 2.97	. .	−15.54	18 12 23.79	− 0.31
	10	μ Geminorum	F.	27.6	30.4	32.0	38.5	40.8	43.0	49.6	51.4	54.1	15 40.82	− 0.47	−15.41	−15.54	6 15 24.81	− 0.17
	11	B. A. C. 2117	F.	. .	. .	54.7	57.0	59.7	2.6	5.4	. .	. .	24 59.88	− 0.71	. .	−15.58	6 24 43.59	− 1.18
	12	B. A. C. 2158	F.	28.7	32.0	33.7	41.5	43.9	46.5	54.3	56.0	59.4	29 44.00	− 0.68	. .	−15.58	6 29 27.74	− 1.13
	13	B. A. C. 2190	F.	25.8	29.2	30.9	39.0	41.7	44.2	51.7	53.7	56.9	34 41.46	− 0.69	. .	−15.58	6 34 25.19	− 1.17
	14	α Canis Majoris	F.	42.7	45.2	47.0	53.3	55.4	57.6	3.9	5.6	8.5	39 55.47	− 0.60	−15.63	−15.53	6 39 39.34	+ 0.02
	15	51 Cephei	F.	. .	. .	. .	. .	. .	31.0	16.0	. .	. .	41 49.66	+ 2.53	. .	−15.53	6 41 36.66	− 0.52
	16	B. A. C. 2252	F.	22.3	25.3	27.2	34.6	37.1	39.6	47.0	48.7	51.9	46 37.08	− 0.67	. .	−15.59	6 46 20.82	− 1.16
	17	B. A. C. 2282	F.	18.9	21.9	24.0	31.5	34.0	36.5	43.8	45.8	49.1	52 33.94	− 0.68	. .	−15.59	6 52 17.67	− 1.19
	18	ε Canis Majoris	F.	46.4	49.2	51.0	57.9	0.1	2.9	9.4	11.1	14.2	54 0.24	− 0.64	−15.64	−15.53	6 53 44.07	+ 0.06
	19	B. A. C. 2335	F.	46.7	50.1	51.6	59.7	2.5	5.1	12.8	14.7	17.9	2 2.34	− 0.69	. .	−15.59	7 1 46.06	− 1.24
	20	δ Geminorum	F.	43.6	46.3	47.8	54.4	56.7	58.8	5.4	7.0	10.0	12 56.67	− 0.47	−15.50	−15.53	7 12 40.67	− 0.09
14	21	Durch. 27°, 744	S.	5.0	8.0	9.6	16.5	18.9	21.2	28.0	29.9	32.8	9 18.88	− 0.48	. .	−15.34	5 9 3.06	− 0.64
	22	Moon I, S.	S.	28.2	31.3	33.3	40.3	42.6	45.0	52.0	53.6	56.8	11 42.57	− 0.48	. .	−15.34	5 11 26.75	+75.55
	23	α Leporis	S.	19.8	21.2	25.5	27.8	29.9	32.0	34.1	40.0	42.4	27 29.82	− 0.61	−15.39	−15.33	5 27 13.88	+ 0.02
	24	ε Orionis	S.	56.7	59.2	0.7	6.9	8.9	10.8	17.0	18.5	21.1	30 8.87	− 0.56	−15.34	−15.33	5 29 52.98	0.00
	25	B. A. C. 1843	S.	. .	. .	4.3	6.5	. .	10.6	14.8	16.4	18.9	42 6.48	− 0.58	. .	−15.34	5 41 50.56	− 0.79
	26	α Orionis	S.	28.6	31.1	32.7	38.9	41.0	43.0	49.0	50.6	53.2	48 40.90	− 0.53	−15.28	−15.32	5 48 25.05	− 0.07
	27	δ Ursæ Minoris, S. P.	S.	. .	52.3	18.0	42.9	. .	33.7	25.6	59.0	14.2	12 42.62	− 2.29	. .	−15.32	18 12 25.01	+ 0.66
	28	γ Geminorum	S.	33.6	36.0	37.6	44.2	46.5	48.4	54.8	56.3	59.0	30 46.27	− 0.51	−15.26	−15.32	6 30 30.44	− 0.09
	29	51 Cephei	S.	. .	. .	26.0	6.2	49.5	39.8	14.3	. .	. .	41 51.16	+ 1.73	. .	−15.31	6 41 37.58	+ 0.62
	30	α Aquilæ	Sk.	43.1	45.6	51.4	53.5	55.6	57.6	59.7	5.5	7.8	44 55.53	− 0.49	−15.05	−15.04	19 44 40.00	+ 0.05
	31	α Cygni	Sk.	6.6	10.0	12.4	21.1	23.6	26.8	35.4	37.5	41.2	37 23.84	− 0.34	−15.30	−15.03	20 37 8.47	+ 0.29
15	32	Sun I, N.	Sk.	32.8	35.4	37.0	43.4	45.4	47.4	53.8	55.2	58.0	54 45.38	− 0.56	. .	−15.04	21 54 29.78	. .
	33	Sun II, S.	Sk.	46.2	48.5	50.3	56.5	58.6	0.7	7.2	8.6	11.2	56 58.64	− 0.56	. .	−15.04	21 56 43.04	. .
	34	α Pegasi	Sk.	33.7	36.4	38.0	44.2	46.3	48.5	54.7	56.4	59.0	58 46.36	− 0.47	−15.05	−15.00	22 58 30.89	+ 0.08
	35	Mercury I, N.	Sk.	23.5	26.0	27.6	. .	. .	. .	43.9	45.6	48.2	1 35.80	− 0.53	. .	−15.00	23 1 20.27	+ 0.28
	36	Mercury II, S.	Sk.	. .	. .	32.0	34.0	36.1	38.2	40.3	. .	. .	1 36.12	− 0.53	. .	−15.00	23 1 20.59	− 0.04
	37	B. A. C. 1090	Sk.	. .	. .	36.6	38.5	40.7	42.6	44.6	. .	. .	24 40.60	− 0.56	. .	−14.88	3 24 25.16	− 0.06
	38	B. A. C. 1134	Sk.	30.5	33.0	34.4	40.6	42.8	44.9	51.0	52.5	55.0	31 42.74	− 0.56	. .	−14.88	3 31 27.30	− 0.10
	39	B. A. C. 1147	Sk.	29.4	32.2	33.8	40.4	42.7	45.0	51.7	53.3	56.1	37 42.73	− 0.46	. .	−14.88	3 37 27.39	+ 0.03
	40	ζ Persei	Sk.	17.5	20.4	22.2	29.6	31.9	34.3	41.5	43.4	46.3	46 31.90	− 0.43	−14.84	−14.95	3 46 16.52	− 0.12
	41	γ^1 Eridani	Sk.	15.0	17.8	19.2	25.6	27.7	29.8	36.2	37.6	40.3	52 27.69	− 0.60	−14.93	−14.95	3 52 12.14	+ 0.02
	42	B. A. C. 1251	Sk.	33.8	36.4	38.0	44.0	46.1	48.2	54.3	55.9	58.5	56 46.13	− 0.52	. .	−14.88	3 56 30.73	− 0.18
	43	B. A. C. 1275	Sk.	6.0	8.5	10.0	16.3	18.3	20.6	26.8	28.4	31.0	2 18.43	− 0.50	. .	−14.88	4 2 3.05	− 0.19
	44	B. A. C. 1285	Sk.	44.5	47.1	48.5	54.7	56.7	58.8	5.0	6.4	9.0	4 56.74	− 0.52	. .	−14.88	4 4 41.34	− 0.23
	45	B. A. C. 1330	Sk.	58.6	1.0	2.6	8.9	11.1	13.3	19.4	21.0	23.6	13 11.06	− 0.49	. .	−14.88	4 12 55.69	− 0.25
	46	B. A. C. 1346	Sk.	46.6	49.1	50.7	57.0	59.2	1.4	7.7	9.5	12.2	15 59.27	− 0.48	. .	−14.88	4 15 43.91	− 0.26
	47	B. A. C. 1365	Sk.	18.3	21.0	22.5	29.0	31.0	33.2	39.8	41.2	44.0	18 31.11	− 0.48	. .	−14.88	4 18 15.75	− 0.28
	48	B. A. C. 1386	Sk.	8.1	10.7	12.2	18.2	20.3	22.3	28.4	30.0	32.4	22 20.29	− 0.54	. .	−14.88	4 22 4.87	− 0.35
	49	B. A. C. 1407	Sk.	8.1	11.3	13.1	20.8	23.5	26.0	33.5	35.3	38.5	26 23.34	− 0.72	. .	−14.88	4 26 7.74	− 0.57
	50	B. A. C. 1427	Sk.	. .	. .	59.5	1.5	3.5	5.6	7.8	. .	. .	30 3.58	− 0.56	. .	−14.88	4 29 48.14	− 0.41

5. Bisections at set D.
22. Bisections at wires II–VI.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
2	35 24	10 7.7	29.1	18.8	24.3	36	. .	. .	. .	234	220	33.1	35 27 37.3	. .	+ 43.4	86 34 41.9	+ 3.1
3	40 0	12.1	5.1	28.8	29.6	32	756	760	. .	. .	. .	33.1	40 4 21.6	. .	+ 51.2	91 11 34.0	+ 1.7
4	20 20	14.6	8.4	4.0	0.2	37	. .	020	. .	036	. .	33.1	20 23 13.7	. .	+ 22.6	71 29 57.5	+ 7.8
5	14 52	13.7	7.8	1.1	0.4	34	. .	. .	. .	058	076	33.1	14 56 0.2	. .	+ 16.2	66 2 37.6	+ 9.5
6	17 46	16.0	10.0	4.1	1.9	36	. .	. .	. .	508	520	33.1	17 49 20.8	. .	+ 19.6	68 56 1.6	+ 8.6
7	40 50	9.0	1.6	25.0	24.2	36	. .	766	. .	792	. .	33.1	40 53 24.3	. .	+ 52.7	92 0 38.2	+ 1.5
8	37 24	10.1	2.2	25.6	26.3	33	. .	. .	. .	910	920	33.1	37 28 7.4	. .	+ 46.7	88 35 15.3	+ 2.5
9	305 28	4.3	27.4	18.5	27.5	38	012	016	016	000	004	33.1	305 31 8.4	. .	− 1 25.3	356 36 4.3	+ 0.6
10	16 14	7.2	2.1	25.3	26.9	31	. .	. .	. .	676	684	33.1	16 18 42.5	. .	+ 17.8	67 25 21.5	+ 2.4
11	79 44	10.7	2.8	27.2	26.4	34	. .	. .	. .	594	554	33.1	79 47 56.1	. .	+ 5 28.2	130 59 45.5	− 5.6
12	74 54	14.8	5.9	27.8	29.1	32	. .	. .	. .	642	658	33.1	74 58 23.0	. .	+ 3 44.0	126 8 28.2	− 4.9
13	76 38	7.9	1.2	24.8	24.5	32	. .	. .	. .	195	195	33.1	76 42 34.8	. .	+ 4 13.4	127 53 9.4	− 4.9
14	55 20	11.2	4.5	26.5	28.2	30	. .	184	. .	190	. .	33.1	55 25 2.5	. .	+ 1 28.3	106 32 52.0	+ 2.8
15	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
16	73 0	10.4	2.0	23.5	26.2	35	. .	. .	. .	524	548	33.1	73 3 42.7	. .	+ 3 18.2	124 13 22.1	− 4.2
17	73 58	12.6	3.0	28.3	26.5	38	608	634	. .	. .	. .	33.1	74 0 52.8	. .	+ 3 30.4	125 10 44.4	− 4.2
18	67 36	8.8	29.6	23.8	24.5	36	. .	638	. .	634	. .	33.1	67 39 27.1	. .	+ 2 27.6	118 48 15.9	+ 0.9
19	76 56	13.7	5.4	26.5	28.5	30	. .	. .	. .	632	608	33.1	77 0 55.0	27.4	+ 4 19.6	128 11 35.8	− 4.2
20	16 36	8.7	3.2	27.2	25.2	31	846	844	. .	. .	. .	33.1	16 40 38.6	. .	+ 18.3	67 47 18.1	+ 2.7
21	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
22	11 48	14.0	8.4	1.4	0.5	32	060	066	150	256	252	34.2	11 52 30.1	. .	+ 13.0	62 59 4.3	. .
23	56 42	9.7	0.1	. .	25.1	30	. .	. .	. .	944	898	34.2	56 46 55.2	. .	+ 1 33.9	107 54 50.3	+ 0.3
24	40 6	7.2	29.0	22.3	23.5	35	. .	547	. .	553	. .	34.2	40 9 46.1	. .	+ 52.0	91 16 59.3	+ 0.6
25	48 32	8.7	0.6	24.0	25.2	36	. .	. .	. .	744	751	34.2	48 35 26.4	. .	+ 1 9.9	99 42 57.5	− 0.6
26	31 26	11.6	5.0	29.0	27.3	34	. .	. .	. .	097	113	34.2	31 30 3.4	23.3	+ 37.8	82 37 2.4	+ 1.5
27	305 28	10.0	3.5	26.3	27.8	37	557	. .	. .	. .	577	34.2	305 31 11.2	. .	− 1 26.5	356 36 5.9	+ 2.4
28	22 18	8.6	1.8	24.7	25.6	30	. .	907	. .	013	. .	34.2	22 22 54.3	21.7	+ 25.5	73 29 41.0	+ 2.2
29	311 36	7.6	0.9	23.5	25.8	32	936	. .	. .	. .	952	34.2	311 40 24.8	. .	− 1 9.7	2 45 36.3	+ 2.1
30	30 16	7.5	3.3	1.9	26.3	30	. .	780	. .	798	. .	34.6	30 20 55.2	16.5	+ 37.8	81 27 54.2	+ 2.0
31	354 0	12.0	8.5	2.6	0.8	34	. .	315	. .	315	. .	34.6	354 3 57.8	. .	− 6.6	45 10 12.4	+ 1.8
32	51 10	9.8	2.5	1.5	27.0	33	182	186	. .	. .	. .	34.6	51 14 17.2	. .	+ 1 17.2	102 21 55.6	. .
33	51 42	6.8	29.1	29.5	23.5	31	. .	. .	. .	910	940	34.6	51 46 41.0	22.9	+ 1 18.7	102 54 20.9	. .
34	24 18	10.0	3.5	3.0	2.8	36	780	762	. .	. .	. .	34.6	24 21 20.8	. .	+ 28.0	75 28 10.0	+ 3.7
35	43 35	8 14.0 12 12.3	6.5 6.0	5.1 5.2	0.0 29.6	36	752	750	. .	. .	. .	34.6	43 38 19.0	. .	+ 58.9	94 45 39.1	. .
36	43 35	8 14.0 12 12.3	6.5 6.0	5.1 5.2	0.0 29.6	36	. .	. .	. .	. .	670	34.6	43 38 22.4	24.9	+ 58.9	94 45 42.5	. .
37	44 18	9.2	3.1	2.1	26.1	30	544	564	. .	. .	. .	34.4	44 22 58.2	19.6	+ 1 1.1	95 30 20.5	− 1.3
38	44 26	7.5	1.5	29.8	23.7	35	922	918	. .	. .	. .	34.4	44 29 37.6	. .	+ 1 1.4	95 37 0.2	− 1.2
39	15 6	12.3	7.5	3.5	28.9	33	. .	720	. .	732	. .	34.4	15 10 6.8	. .	+ 17.0	66 16 45.0	+ 9.1
40	7 18	9.1	4.5	1.1	27.9	31	. .	. .	. .	640	650	34.4	7 22 41.6	. .	+ 8.1	58 29 10.9	+ 0.8
41	52 40	11.8	5.2	1.4	28.5	33	070	098	. .	. .	. .	34.4	52 44 17.4	. .	+ 1 22.2	103 52 0.8	+ 2.8
42	33 10	12.4	7.1	1.6	28.8	32	290	340	. .	. .	. .	34.4	33 14 28.6	. .	+ 41.1	84 21 30.9	+ 3.0
43	25 46	7.6	1.8	28.7	26.0	37	825	780	. .	. .	. .	34.4	25 49 8.9	. .	+ 30.4	76 56 0.5	+ 5.7
44	33 38	6.1	0.0	27.9	24.7	37	. .	. .	. .	868	880	34.4	33 41 9.4	. .	+ 41.8	84 48 12.4	+ 3.0
45	25 6	9.0	2.2	21.1	25.4	37	778	768	. .	. .	. .	34.4	25 9 10.6	. .	+ 29.5	76 16 1.3	+ 6.1
46	21 34	9.1	3.5	27.7	27.1	33	246	218	. .	. .	. .	34.4	21 38 17.8	. .	+ 24.9	72 45 3.9	+ 7.4
47	21 10	6.4	1.5	24.4	24.8	31	670	662	. .	. .	. .	34.4	21 14 44.4	. .	+ 24.4	72 21 30.0	+ 7.5
48	37 42	6.4	29.0	20.7	23.9	31	855	868	. .	. .	. .	34.4	37 46 43.0	. .	+ 48.7	88 53 52.9	+ 1.8
49	74 42	8.8	0.5	25.8	26.0	36	220	230	. .	. .	. .	34.4	74 45 33.0	16.7	+ 3 47.8	125 55 42.0	− 8.2
50	42 42	6.7	28.9	25.2	24.3	39	018	008	. .	. .	. .	34.4	42 44 52.1	. . .	+ 58.1	93 52 11.4	+ 0.3

No.	Barom.	At. Ther.
	in.	°
19	29.99	31.0
26	30.07	26.0
29	30.08	24.0
30	30.20	16.8
33	30.18	21.6
36	30.17	25.8
37	30.18	22.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
22	−11 53.1	− 16 2.0	. .	− 27 55.1
32	− 6.9	+ 16 12.6	. .	+ 16 5.7
33	− 7.0	− 16 12.6	. .	− 16 19.6
35	− 6.7	+ 1.8	− 0.2	− 5.1
36	− 6.7	− 1.8	. .	− 8.9

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Feb. 15	1	B. A. C. 1431 . .	Sk.	50.9	53.4	54.9	1.2	3.2	5.2	11.3	12.8	15.4	31 3.14	− 0.54	. .	−14.88	4 30 47.72	− 0.40
	2	B. A. C. 1449 . .	Sk.	47.3	50.0	51.4	58.0	0.2	2.5	9.3	10.8	13.7	35 0.36	− 0.46	. .	−14.88	4 34 45.02	− 0.38
	3	B. A. C. 1464 . .	Sk.	39.2	42.3	44.1	52.0	54.5	57.2	4.8	6.7	10.0	37 54.53	− 0.73	. .	−14.88	4 37 38.92	− 0.64
	4	B. A. C. 1493 . .	Sk.	6.7	9.2	11.0	17.4	19.5	21.7	28.2	29.8	32.5	44 19.56	− 0.48	. .	−14.88	4 44 4.20	− 0.44
	5	B. A. C. 1515 . .	Sk.	. .	. .	2.7	4.8	6.7	8.9	10.9	. .	. .	48 6.80	− 0.50	. .	−14.88	4 47 51.42	− 0.47
	6	B. A. C. 1519 . .	Sk.	. .	. .	37.4	39.5	41.5	43.6	45.6	. .	. .	48 41.52	− 0.54	. .	−14.88	4 48 26.10	− 0.50
	7	B. A. C. 1564 . .	Sk.	41.0	43.8	45.8	53.0	55.5	57.9	5.0	6.8	9.8	57 55.40	− 0.69	. .	−14.88	4 56 39.83	− 0.69
	8	B. A. C. 1568 . .	Sk.	6.9	9.6	11.2	17.5	19.7	21.9	28.2	29.8	32.6	0 19.71	− 0.48	. .	−14.88	5 0 4.35	− 0.54
	9	B. A. C. 1591 . .	Sk.	36.0	38.6	40.4	46.5	48.6	50.8	57.0	58.8	1.5	2 48.69	− 0.49	. .	−14.88	5 2 33.32	− 0.56
	10	β Orionis. . . .	Sk.	35.7	38.2	39.8	46.0	48.0	50.0	56.2	57.8	0.3	8 48.00	− 0.58	−14.95	−14.94	5 8 32.48	+ 0.01
	11	B. A. C. 1630 . .	Sk.	. .	. .	31.7	34.0	36.5	39.1	41.8	. .	. .	9 36.62	− 0.72	. .	−14.88	5 9 21.02	− 0.78
	12	B. A. C. 1650 . .	Sk.	0.1	3.0	5.0	12.7	15.0	17.7	24.9	26.7	30.0	13 15.01	− 0.71	. .	−14.88	5 12 59.42	− 0.79
	13	B. A. C. 1665¹. .	Sk.	19.8	22.2	23.8	. .	. .	. .	40.0	41.6	44.0	16 31.90	− 0.53	.	−14.88	5 16 16.49	− 0.64
	14	B. A. C. 1665². .	Sk.	. .	. .	28.9	30.9	33.0	35.0	36.9	. .	. .	16 32.94	− 0.53	. .	−14.88	5 16 17.53	− 0.64
	15	B. A. C. 1694 . .	Sk.	21.5	24.7	26.6	34.4	37.0	39.6	47.0	49.0	52.3	19 36.90	− 0.73	. .	−14.88	5 19 21.29	− 0.84
	16	B. A. C. 1717 . .	Sk.	27.0	29.7	31.2	37.3	39.4	41.5	47.4	48.9	51.5	23 39.32	− 0.55	. .	−14.88	5 23 23.89	− 0.68
	17	B. A. C. 1726 . .	Sk.	56.2	58.9	0.4	6.9	8.9	11.3	17.7	19.3	22.0	25 9.07	− 0.48	. .	−14.88	5 24 53.71	− 0.70
	18	B. A. C. 1742 . .	Sk.	51.9	54.6	56.2	3.0	5.2	7.5	14.0	15.6	18.5	28 5.17	− 0.46	. .	−14.88	5 27 49.83	− 0.74
	19	B. A. C. 1762¹. .	Sk.	23.0	25.6	27.0	. .	. .	. .	43.7	45.1	47.7	29 35.35	− 0.57	. .	−14.88	5 29 19.90	− 0.71
	20	B. A. C. 1762². .	Sk.	. .	. .	31.8	33.8	35.8	37.8	39.9	. .	. .	29 35.82	− 0.57	. .	−14.88	5 29 20.37	− 0.71
	21	B. A. C. 1792 . .	Sk.	7.7	10.3	12.0	18.2	20.4	22.5	29.0	30.5	33.2	34 20.42	− 0.48	. .	−14.88	5 34 5.06	− 0.75
	22	B. A. C. 1806 . .	Sk.	7.3	8.6	12.8	15.0	16.9	19.0	21.0	25.1	26.6	36 16.92	− 0.54	. .	−14.88	5 36 1.50	− 0.74
	23	B. A. C. 1859 . .	Sk.	47.7	50.8	52.5	59.7	2.2	4.7	12.1	13.9	17.0	44 2.29	− 0.70	. .	−14.88	5 43 46.71	− 0.90
	24	B. A. C. 1878 . .	Sk.	34.8	37.7	39.6	47.1	49.7	52.2	59.8	1.6	4.9	46 49.71	− 0.72	. .	−14.88	5 46 34.11	− 0.94
	25	B. A. C. 1904 . .	Sk.	. .	. .	59.7	2.4	5.0	7.8	10.5	. .	. .	51 5.08	− 0.75	. .	−14.88	5 50 49.45	− 1.00
	26	B. A. C. 1910 . .	Sk.	. .	. .	50.5	52.8	55.2	57.5	59.9	. .	. .	51 55.18	− 0.69	. .	−14.88	5 51 39.61	− 0.92
	27	B. A. C. 1982 . .	Sk.	16.0	19.0	20.9	28.6	31.3	33.9	41.2	43.3	46.6	3 31.20	− 0.73	. .	−14.88	6 3 15.59	− 1.02
	28	B. A. C. 1996 . .	Sk.	5.7	8.8	10.8	18.0	20.6	23.0	30.7	32.5	35.7	6 20.64	− 0.71	. .	−14.88	6 6 5.05	− 1.00
	29	δ Ursæ Minoris . .	Sk.	. .	. .	32.5	6.5	42.0	16.5	. .	. .	. .	12 41.64	− 2.51	. .	−14.92	18 12 24.21	− 0.37
	30	μ Geminorum . .	Sk.	. .	. .	. .	. .	. .	44.7	49.0	50.7	53.5	15 40.20	− 0.46	−14.83	−14.92	6 15 24.82	− 0.13
	31	B. A. C. 2073 . .	Sk.	. .	. .	45.6	48.0	50.4	52.9	55.2	. .	. .	18 50.42	− 0.69	. .	−14.88	6 18 34.85	− 1.02
	32	B. A. C. 2089 . .	Sk.	42.0	45.3	47.4	52.7	55.0	57.9	0.6	. .	. .	20 57.95	− 0.75	. .	−14.88	6 20 42.32	− 1.16
	33	B. A. C. 2109 . .	Sk.	34.4	37.3	39.1	46.4	48.9	51.1	58.5	0.3	3.3	23 48.81	− 0.69	. .	−14.88	6 23 33.24	− 1.05
	34	B. A. C. 2135 . .	Sk.	38.2	41.6	43.7	51.7	54.5	57.2	5.1	7.0	10.6	26 54.40	− 0.75	. .	−14.88	6 26 38.77	− 1.14
	35	γ Geminorum . .	Sk.	33.0	35.7	37.3	43.6	45.8	48.1	54.5	56.0	58.6	30 45.84	− 0.48	−14.87	−14.92	6 30 30.44	− 0.08
	36	B. A. C. 2183 . .	Sk.	12.0	13.7	18.6	20.9	23.4	25.8	28.2	33.0	34.8	33 23.38	− 0.69	. .	−14.88	6 33 7.81	− 1.07
	37	B. A. C. 2195 . .	Sk.	42.5	45.8	47.8	55.4	58.0	0.7	8.7	10.5	13.8	35 58.13	− 0.73	. .	−14.88	6 35 42.52	− 1.14
	38	a Canis Majoris . .	Sk.	42.2	44.8	46.2	52.5	54.6	56.9	3.2	5.0	7.8	39 54.80	− 0.61	−14.88	−14.92	6 39 39.27	− 0.02
	39	B. A. C. 2523 . .	Sk.	46.5	49.5	51.2	58.8	1.4	3.8	11.2	13.2	16.2	33 1.31	− 0.71	. .	−14.88	7 32 45.72	− 1.25
	40	B. A. C. 2543 . .	Sk.	4.4	7.7	9.5	17.4	20.0	22.6	30.3	32.3	35.4	35 19.96	− 0.73	. .	−14.88	7 35 4.35	− 1.29
	41	B. A. C. 2561 . .	Sk.	39.5	42.4	44.4	52.0	54.5	56.9	4.6	6.3	9.4	38 54.44	− 0.72	. .	−14.88	7 38 38.84	− 1.27
	42	B. A. C. 2580 . .	Sk.	49.5	52.8	54.7	2.3	5.0	7.8	15.4	17.4	20.5	41 5.04	− 0.73	. .	−14.88	7 40 49.43	− 1.29
	43	B. A. C. 2595 . .	Sk.	. .	. .	11.4	13.8	16.4	19.0	21.7	. .	. .	43 16.46	− 0.74	. .	−14.88	7 43 0.84	− 1.30
	44	B. A. C. 2629 . .	Sk.	37.5	40.6	42.5	50.0	52.5	54.8	2.4	4.2	7.3	47 52.42	− 0.71	. .	−14.88	7 47 36.83	− 1.28
	45	B. A. C. 2646 . .	Sk.	0.0	3.0	5.0	12.5	14.8	17.5	24.8	26.7	29.7	50 14.89	− 0.71	. .	−14.88	7 49 59.30	− 1.28
	46	B. A. C. 2655 . .	Sk.	46.9	48.6	53.4	55.8	58.0	0.4	2.8	7.4	9.2	52 58.06	− 0.68	. .	−14.88	7 52 42.50	− 1.25
	47	B. A. C. 2671 . .	Sk.	. .	. .	15.4	18.0	20.5	23.2	25.8	. .	. .	55 20.58	− 0.74	. .	−14.88	7 55 4.96	− 1.33
	48	B. A. C. 2699¹. .	Sk.	. .	. .	25.9	28.4	30.7	33.2	38.0	39.8	42.9	58 28.37	− 0.69	. .	−14.88	7 58 12.80	− 1.28
	49	B. A. C. 2735 . .	Sk.	18.1	21.2	23.2	30.6	33.0	35.6	43.1	44.8	48.0	3 33.07	− 0.71	. .	−14.88	8 3 17.48	− 1.30
	50	B. A. C. 2758 . .	Sk.	26.2	29.5	31.4	39.0	41.6	44.1	51.8	53.8	56.9	6 41.59	− 0.73	. .	−14.88	8 6 25.98	− 1.32

26. Telescope micrometer reading increased one revolution in reduction.
29. Bisections at wires D_1 and D_2.
48. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MIRCOMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° '	r. "	"	"	"							"	° ' "	°	' "	° ' "	"
1	38 4	10 2.8	25.4	20.1	21.8	34	014	014	. .	. .	. .	34.4	38 8 12.5	. .	+ 49.4	89 15 23.1	+ 1.8
2	16 6	5.9	0.1	25.4	24.6	33	. .	482	. .	452	. .	34.4	16 10 17.3	17.1	+ 18.2	67 16 56.7	+ 9.4
3	76 10	8.7	0.9	24.8	26.4	38	. .	. .	. .	586	604	34.4	76 12 57.4	. .	+ 4 12.2	127 23 30.8	— 8.2
4	20 12	. .	0.1	. .	24.3	35	990	080	. .	. .	. .	34.4	20 15 38.0	. .	+ 23.2	71 22 22.4	+ 8.0
5	27 36	6.0	29.5	23.3	24.4	35	260	244	. .	. .	. .	34.4	27 39 50.3	. .	+ 33.0	78 46 44.5	+ 5.5
6	38 34	3.1	26.0	20.3	21.7	38	. .	. .	. .	718	724	34.4	38 37 0.8	. .	+ 50.3	89 44 12.3	+ 1.9
7	70 44	0.6	24.2	18.1	20.6	34	790	834	. .	. .	. .	34.4	70 48 1.6	16.2	+ 2 59.5	121 57 22.3	— 6.7
8	20 20	4.5	28.3	22.8	23.0	32	. .	210	. .	232	. .	34.4	20 24 38.2	. .	+ 23.5	71 31 22.9	+ 8.0
9	23 22	4.9	28.7	22.3	23.7	30	865	890	. .	. .	. .	34.4	23 26 58.3	. .	+ 27.4	74 33 46.9	+ 6.9
10	47 10	4.6	28.2	21.4	23.7	36	945	982	. .	. .	. .	34.4	47 13 25.3	. .	+ 1 8.1	98 20 54.6	+ 2.5
11	74 44	3.6	26.3	17.2	21.9	34	. .	. .	. .	165	165	34.4	74 48 10.0	. .	+ 3 49.0	125 58 20.2	— 7.2
12	73 48	4.1	26.7	18.2	22.8	37	. .	580	. .	580	. .	34.4	73 51 17.5	. .	+ 3 35.3	125 1 14.0	— 7.0
13	35 24	29.4	22.9	15.9	19.6	36	800	830	. .	. .	. .	34.4	35 27 32.7	. .	+ 44.9	86 34 38.8	+ 3.0
14	35 24	29.4	22.9	15.9	19.6	38	. .	. .	. .	780	790	34.4	35 27 3.2	. .	+ 44.9	86 34 9.3	+ 3.0
15	76 14	2.5	24.2	15.2	19.7	39	. .	782	. .	894	. .	34.4	76 16 45.5	. .	+ 4 14.0	127 27 20.7	— 7.2
16	40 0	3.2	27.0	21.2	22.7	33	538	650	. .	. .	. .	34.4	40 4 17.9	. .	+ 53.1	91 11 32.2	+ 1.6
17	20 20	3.8	27.5	21.5	22.6	37	. .	. .	. .	928	932	34.4	20 23 12.0	. .	+ 23.5	71 29 56.7	+ 7.8
18	14 52	4.8	29.7	23.5	24.8	34	830	830	. .	. .	. .	34.4	14 55 57.0	. .	+ 16.8	66 2 35.0	+ 9.5
19	44 48	5.6	28.9	20.9	23.6	33	. .	. .	. .	808	. .	34.4	44 52 14.0	. .	+ 1 2.8	95 59 38.0	+ 0.3
20	44 48	5.6	28.9	20.9	23.6	33	. .	. .	. .	. .	210	34.4	44 52 23.2	. .	+ 1 2.8	95 59 47.2	+ 0.3
21	22 22	4.0	29.0	19.9	22.8	38	. .	248	. .	. .	. .	34.4	22 25 6.4	15.3	+ 26.1	73 31 53.7	+ 7.1
22	37 24	2.8	26.2	18.9	22.3	34	. .	. .	. .	550	628	34.4	37 28 4.3	. .	+ 48.4	88 35 13.9	+ 2.4
23	72 14	3.0	24 5	16.3	22.3	31	. .	. .	. .	542	400	34.4	72 18 52.7	. .	+ 3 16.2	123 28 30.1	— 5.9
24	74 36	5.5	27.7	19.2	23.5	38	. .	. .	. .	830	792	34.4	74 38 57.8	. .	+ 3 47.1	125 49 6.1	— 6.3
25	78 44	4.0	26.8	17.6	22.1	37	. .	025	. .	. .	. .	34.4	78 47 26.0	. .	+ 5 10.8	129 58 58.0	— 6.8
26	70 12	3.5	25.9	16.6	22.9	38	. .	. .	. .	168	120	34.4	70 14 54.6	. .	+ 2 54.7	121 24 10.5	— 5.4
27	76 0	5.3	27.3	18.6	23.5	35	660	660	. .	. .	. .	34.4	76 3 45.7	14.9	+ 4 10.5	127 14 17.4	— 6.1
28	73 34	2.0	25.5	17.3	22.6	35	. .	980	. .	. .	. .	34.4	73 37 42.9	. .	+ 3 32.7	124 47 36.8	— 5.6
29	305 28	6.1	1.2	24.5	25.2	37	612	655	. .	. .	. .	34.4	305 31 12.5	14.3	— 1 28.5	356 36 5.2	+ 1.9
30	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	.	. . . .	. .	. .	. . . .	. .
31	70 30	6.5	28.5	20.8	24.5	33	158	074	. .	. .	. .	34.4	70 34 23.3	. .	+ 2 58.0	121 43 42.5	— 4.9
32	78 58	5.5	26.8	19.6	23.9	37	330	354	. .	. .	. .	34.4	79 1 19.6	. .	+ 5 17.8	130 12 58.6	— 6.0
33	71 16	5.7	27.9	20.4	24.0	31	. .	. .	. .	500	542	34.4	71 20 49.0	. .	+ 3 5.8	122 30 16.0	— 4.8
34	79 6	5.7	27.7	19.7	23.6	34	. .	330	. .	325	. .	34.4	79 10 6.1	. .	+ 5 45.0	130 22 12.3	— 5.8
35	22 18	5.5	0.2	25.0	24.2	31	. .	. .	. .	142	146	34.4	22 22 53.5	. .	+ 26.1	73 29 40.8	+ 2.0
36	71 0	1.5	23.7	16.7	21.2	31	930	948	. .	. .	. .	34.4	71 4 45.7	. .	+ 3 3.2	122 14 10.1	— 4.6
37	76 48	9.7	3.5	25.2	27.5	34	. .	. .	. .	800	816	34.4	76 51 54.1	. .	+ 4 26.5	128 2 41.8	— 5.3
38	55 20	2.3	26.1	18.5	22.7	30	. .	932	. .	052	. .	34.4	55 24 59.1	13.9	+ 1 31.7	106 32 52.0	+ 2.5
39	73 28	7.1	29.2	23.2	24.0	36	748	712	. .	. .	. .	34.4	73 31 27.2	. .	+ 3 32.5	124 41 20.9	— 3.6
40	76 46	2.9	26.3	17.1	20 5	32	. .	. .	. .	445	640	34.4	76 50 36.1	. .	+ 4 27.1	128 1 24.4	— 3.7
41	74 32	3.2	26.0	18.2	21.5	38	. .	. .	. .	130	. .	34.4	74 35 10.1	. .	+ 3 47.7	125 45 19.0	— 3.5
42	76 26	8.3	2.5	23.3	26.1	37	. .	. .	. .	184	150	34.4	76 29 19.4	. .	+ 4 20.2	127 40 0.8	— 3.6
43	76 58	6.7	29.2	21.3	25.1	37	. .	. .	. .	188	080	34.4	77 1 21.9	12.1	+ 4 31.0	128 12 14.1	— 3.5
44	73 10	4.5	26.7	18.8	23.1	35	630	504	. .	. .	. .	34.4	73 13 47.6	. .	+ 3 28.8	124 23 37.6	— 3.2
45	73 18	4.8	27.2	20.1	24.0	37	. .	425	. .	422	. .	34.4	73 21 18.9	. .	+ 3 30.5	124 31 10.6	— 3.2
46	68 48	1.4	24.0	16.8	21.6	39	. .	298	. .	060	. .	34.4	68 50 55.1	. .	+ 2 43.6	119 59 59.9	— 2.8
47	77 42	3.2	25.7	16.0	21.3	33	. .	. .	. .	020	964	34.4	77 46 14.0	. .	+ 4 47.7	128 57 22.9	— 3.3
48	70 50	3.2	25.7	15.0	21.7	31	. .	. .	. .	172	248	34.4	70 57 29.7	. .	+ 3 3.0	122 6 53.9	— 2.8
49	73 38	6.2	28.1	22.0	23.6	38	. .	680	. .	705	. .	34.4	73 40 58.5	. .	+ 3 35.0	124 50 54.7	— 2.9
50	75 42	3.7	26.6	18.1	22.6	39	. .	. .	. .	192	. .	34.4	75 44 53.3	. .	+ 4 7.1	126 55 21.6	— 2.9

No.	Barom.	At. Ther.		No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	in.	°			' "	' "	' "	' "
7	30.22	18.5						
27	30.22	18.0						

For summary of the elements of reduction see page 3.

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Feb. 15	1	B. A. C. 2775 . .	Sk.	19.9	21.8	26.5	29.0	31.4	33.9	36.2	41.0	42.8	9 31.39	− 0.69	. .	−14.88	8 9 15.82	− 1.29
	2	B. A. C. 2805 . .	Sk.	39.7	42.8	44.6	52.2	54.8	57.2	4.9	6.7	9.9	16 54.76	− 0.72	. .	−14.88	8 16 39.16	− 1.33
	3	B. A. C. 2820 . .	Sk.	. .	. .	51.6	54.3	56.7	59.2	1.9	. .	. .	18 56.74	− 0.73	. .	−14.88	8 18 41.13	− 1.35
	4	B. A. C. 2941 . .	Sk.	45.0	48.2	50.2	. .	. .	. .	11.4	13.4	16.7	36 0.82	− 0.75	. .	−14.88	8 35 45.19	− 1.38
	5	ε Hydræ	Sk.	13.8	16.4	17.9	23.9	26.0	28.2	34.5	36.0	38.6	40 26.14	− 0.52	−14.87	−14.89	8 40 10.73	− 0.06
	6	B. A. C. 3009 . .	Sk.	0.9	4.3	6.3	14.2	17.0	19.7	27.5	29.5	32.8	45 16.91	− 0.75	. .	−14.88	8 45 1.28	− 1.38
	7	B. A. C. 3030 . .	Sk.	3.0	6.4	8.4	16.0	18.8	21.2	29.0	30.9	34.3	48 18.67	− 0.74	. .	−14.88	8 48 3.05	− 1.37
	8	B. A. C. 3081 . .	Sk.	. .	. .	. .	. .	. .	. .	53.3	55.0	58.5	55 42.37	− 0.76	. .	−14.88	8 55 26.73	− 1.40
	9	B. A. C. 3165 . .	Sk.	. .	56.6	59.2	1.9	4.3	6.8	12.0	13.8	17.0	11 1.75	− 0.73	. .	−14.88	9 10 46.14	− 1.35
	10	B. A. C. 3192 . .	Sk.	29.5	32.4	34.4	41.5	43.9	46.4	53.5	55.0	58.5	15 43.90	− 0.69	. .	−14.88	9 15 28.33	− 1.32
	11	α Hydræ	Sk.	31.0	33.7	35.3	41.4	43.5	45.7	51.6	53.2	56.0	21 43.49	− 0.58	−14.90	−14.89	9 21 28.02	− 0.02
	12	Venus II, S. . .	E.	59.2	1.9	3.6	10.0	12.3	14.5	20.8	22.6	25.4	46 12.26	− 0.74	. .	−14.92	18 45 56.60	− 0.91
	13	Venus N. . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	14	δ Draconis . . .	E.	. .	. .	43.4	48.7	54.0	. .	4.9	8.7	15.4	12 43.38	− 0.35	. .	−14.93	19 12 28.10	− 0.07
	15	γ Aquilæ	E.	21.1	23.5	25.3	31.5	33.5	35.6	41.9	43.3	45.9	40 33.51	− 0.63	−14.91	−14.92	19 40 17.96	+ 0.02
	16	α Aquilæ	E.	43.2	45.7	47.1	53.4	55.5	57.5	3.9	5.5	8.0	44 55.53	− 0.63	−14.89	−14.91	19 44 39.99	+ 0.02
	17	B. A. C. 7022 . .	E.	42.0	45.8	47.5	55.2	58.1	0.8	8.9	11.2	14.0	18 58.17	− 0.52	. .	−14.93	20 18 42.72	+ 1.76
	18	α Cygni	E.	6.5	10.0	12.1	21.0	23.8	26.5	35.1	37.4	41.0	37 23.71	− 0.50	−14.99	−14.90	20 37 8.31	+ 0.11
16	19	α Andromedæ . .	E.	56.0	58.8	0.4	7.2	9.5	12.0	19.2	21.0	23.9	2 9.78	− 0.51	−14.91	−14.87	0 1 54.40	+ 0.06
	20	γ Pegasi	E.	49.7	52.3	53.8	0.1	2.4	4.5	11.0	12.5	15.1	7 2.38	− 0.56	−14.99	−14.87	0 6 46.95	+ 0.02
	21	γ Ceti	E.	52.4	55.0	56.4	2.7	4.7	6.8	12.9	14.4	17.0	37 4.70	− 0.58	−14.88	−14.84	2 36 49.28	+ 0.04
	22	B. A. C. 881 . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	3.29	44 50.60	− 0.53	. .	−14.84	2 44 35.23	+ 0.32
	23	B. A. C. 921 . .	E.	6.0	8.7	10.3	16.9	19.0	21.3	27.7	29.4	32.2	52 19.06	− 0.51	. .	−14.83	2 52 3.72	+ 0.33
	24	α Ceti	E.	47.7	50.3	51.9	58.0	0.0	2.0	8.2	9.8	12.3	56 0.02	− 0.57	−14.81	−14.84	2 55 44.61	− 0.01
	25	B. A. C. 994 . .	E.	26.8	29.4	30.9	37.0	39.1	41.1	47.3	48.8	51.3	6 39.08	− 0.60	. .	−14.83	3 6 23.65	+ 0.07
	26	B. A. C. 1013 . .	E.	51.4	52.9	57.0	59.0	1.1	3.3	5.4	9.6	11.0	10 1.19	− 0.63	. .	−14.83	3 9 45.73	+ 0.01
	27	B. A. C. 1040 . .	E.	43.1	46.0	47.7	54.5	56.8	59.2	6.0	7.7	10.7	14 56.86	− 0.48	. .	−14.82	3 14 41.56	+ 0.24
	28	B. A. C. 1057 . .	E.	8.2	10.8	12.4	18.6	20.6	22.7	28.9	30.3	33.0	18 20.61	− 0.56	. .	−14.82	3 18 5.23	+ 0.07
	29	B. A. C. 1068 . .	E.	26.6	29.3	30.7	37.0	39.0	41.0	47.4	49.0	51.5	20 39.06	− 0.55	. .	−14.82	3 20 23.69	+ 0.06
	30	B. A. C. 1092 . .	E.	53.1	55.7	57.3	3.4	5.5	7.7	13.8	15.3	18.0	26 5.53	− 0.55	. .	−14.82	3 25 50.16	+ 0.03
	31	B. A. C. 1134 . .	E.	30.4	32.9	34.4	40.5	42.6	44.7	50.8	52.4	55.0	34 42.63	− 0.61	. .	−14.81	3 34 27.21	− 0.10
	32	η Tauri	E.	. .	. .	14.1	16.3	18.7	20.9	23.2	. .	. .	40 18.64	− 0.50	−14.81	−14.83	3 40 3.31	− 0.02
	33	ζ Persei	E.	17.6	20.6	22.4	29.4	31.9	34.3	41.5	43.3	46.4	46 31.93	− 0.46	−14.85	−14.83	3 46 16.64	+ 0.01
	34	B. A. C. 1221 . .	E.	31.0	33.9	35.5	42.0	44.3	46.6	53.2	54.8	57.6	49 44.32	− 0.50	. .	−14.81	3 49 29.01	− 0.05
	35	γ^1 Eridani. . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	36	B. A. C. 1253 . .	E.	55.2	58.0	59.6	6.3	8.6	10.8	17.4	19.1	22.0	57 8.56	− 0.50	. .	−14.80	3 56 53.26	− 0.09
	37	B. A. C. 1275 . .	E.	. .	. .	14.0	16.1	18.4	20.4	22.5	. .	. .	2 18.28	− 0.54	. .	−14.80	4 2 2.94	− 0.17
	38	B. A. C. 1285 . .	E.	44.3	46.9	48.5	54.6	56.7	58.7	4.9	6.3	8.9	4 56.64	− 0.56	. .	−14.80	4 4 41.28	− 0.22
	39	B. A. C. 1312 . .	E.	. .	. .	36.9	39.6	42.0	44.7	47.3	. .	. .	9 42.10	− 0.78	. .	−14.80	4 9 26.52	− 0.48
	40	B. A. C. 1365 . .	E.	18.3	21.0	22.6	29.0	31.2	33.3	39.6	41.4	44.0	18 31.16	− 0.52	. .	−14.79	4 18 15.85	− 0.26
	41	B. A. C. 1389 . .	E.	25.0	28.2	30.1	38.3	41.0	43.8	51.9	53.7	57.2	22 41.02	− 0.81	. .	−14.79	4 22 25.42	− 0.58
	42	B. A. C. 1407 . .	E.	. .	. .	. .	20.9	23.4	25.9	28.5	. .	. .	26 23.41	− 0.78	. .	−14.79	4 26 7.84	− 0.55
	43	B. A. C. 1427 . .	E.	51.2	53.8	55.3	1.4	3.5	5.5	11.6	13.2	15.9	30 3.49	− 0.60	. .	−14.79	4 29 48.10	− 0.39
	44	B. A. C. 1449 . .	E.	49.9	51.5	56.0	58.1	0.2	2.5	4.6	9.1	10.7	35 0.29	− 0.50	. .	−14.79	4 34 45.00	− 0.36
	45	B. A. C. 1483 . .	E.	42.4	45.8	47.8	55.5	58.0	1.0	9.0	10.8	14.3	41 58.29	− 0.80	. .	−14.78	4 41 42.71	− 0.66
	46	B. A. C. 1493 . .	E.	. .	. .	15.3	17.4	19.6	21.7	23.9	. .	. .	44 19.58	− 0.52	. .	−14.78	4 44 4.28	− 0.43
	47	B. A. C. 1519 . .	E.	29.2	31.8	33.4	39.4	41.4	43.4	49.6	51.0	53.8	48 41.44	− 0.59	. .	−14.78	4 48 26.07	− 0.48
	48	B. A. C. 1644 . .	E.	50.2	53.2	55.2	2.5	5.0	7.5	14.8	16.6	19.8	12 4.98	− 0.76	. .	−14.77	5 11 49.45	− 0.75
	49	B. A. C. 1693 . .	E.	17.0	20.4	22.2	30.4	33.0	35.6	43.6	45.6	49.0	19 32.98	− 0.80	. .	−14.77	5 19 17.41	− 0.84
	50	B. A. C. 1718 . .	E.	13.6	16.5	18.4	25.6	28.0	30.5	37.8	39.5	42.5	23 28.04	− 0.75	. .	−14.77	5 23 12.52	− 0.79

42. Bisections at set C. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan's Corrections.
		V.	VI.	VII.	VIII.	Rev.	1.	2.	3.	4.	5.						
	° '	r. "	"	"	"							"	° ' "	°	' "	° ' "	"
1	70 32	10 3.7	25.7	18.3	22.5	32	. .	. .	. .	. .	965	34.4	70 36 28.8	. .	+ 2 59.6	121 45 49.6	− 2.6
2	74 52	5.0	27.0	20.2	23.0	38	475	525	. .	. .	. .	34.4	74 55 2.1	. .	+ 3 53.2	126 5 16.5	− 2.6
3	76 38	4.0	26.9	18.7	23.2	33	. .	. .	. .	414	340	34.4	76 42 21.8	. .	+ 4 25.0	127 53 8.0	− 2.6
4	78 34	3.3	26.8	17.9	22.5	35	432	485	. .	. .	. .	34.4	78 37 49.8	11.2	+ 5 9.6	129 49 20.6	− 2.2
5	31 56	2.2	26.6	20.9	22.5	33	. .	. .	. .	128	. .	35.4	32 0 26.1	. .	+ 39.9	83 7 27.2	+ 2.1
6	78 36	6.5	0.0	22.2	24.8	35	. .	150	. .	028	. .	34.4	78 39 52.7	. .	+ 5 10.3	129 51 24.2	− 2.0
7	77 0	6.1	28.9	21.2	24.9	33	125	200	. .	. .	. .	34.4	77 4 22.4	. .	+ 4 32.8	128 15 16.4	− 2.0
8	79 32	5.6	28.9	22.5	24.3	41	. .	. .	. .	860	856	34.4	79 34 9.8	. .	+ 5 36.6	130 46 7.6	− 1.7
9	75 40	8.2	0.6	21.9	26.3	37	. .	. .	. .	784	790	34.4	75 43 10.7	. .	+ 4 7.0	126 53 38.9	− 1.5
10	70 2	3.4	26.5	15.7	22.8	39	. .	096	. .	080	. .	34.4	70 4 55.3	10.5	+ 2 55.0	121 14 11.5	− 1.6
11	46 56	2.8	26.2	21.2	22.8	36	272	310	. .	. .	. .	34.4	46 59 36.8	. .	+ 1 8.5	98 7 6.5	+ 1.1
12	58 28	8.3	1.3	1.8	26.8	36	745	. .	. .	. .	845	33.5	58 31 22.1	14.0	+ 1 43.5	109 39 26.8	. .
13	58 28	8.3	1.3	1.8	26.8	38	. .	590	. .	600	. .	33.5	58 30 54.7	. .	+ 1 43.5	109 38 59.4	. .
14	331 24	6.0	0.4	0.1	26.3	34	. .	. .	. .	035	020	33.5	331 28 7.7	. .	− 34.4	22 33 54.5	+ 2.3
15	28 30	11.7	4.9	4.8	0.3	31	. .	100	. .	170	. .	33.5	28 34 45.7	. .	+ 34.5	79 41 41.4	+ 2.3
16	30 16	8.0	0.0	0.8	25.6	30	. .	780	. .	790	. .	33.5	30 20 55.4	. .	+ 37.0	81 27 53.6	+ 1.3
17	358 58	5.2	1.0	0.5	25.0	32	. .	560	. .	510	. .	33.5	359 2 29.5	. .	− 1.1	50 8 49.6	−16.4
18	354 0	8.0	3.2	2.0	28.3	34	. .	455	. .	465	. .	33.5	354 3 57.6	. .	− 6.5	45 10 12.3	+ 1.5
19	10 26	9.3	5.2	3.7	28.6	36	. .	310	. .	325	. .	33.5	10 29 27.7	. .	+ 11.5	61 36 0.4	+ 2.1
20	24 20	12.8	6.5	4.8	26.8	34	. .	385	. .	400	. .	33.5	24 23 56.0	. .	+ 28.1	75 30 45.3	+ 2.1
21	36 6	9.0	1.5	27.0	27.0	32	. .	650	. .	720	. .	32.5	36 10 25.2	. .	+ 45.5	87 17 31.9	+ 0.8
22	24 16	9.4	2.9	27.5	27.5	37	. .	. .	. .	540	550	32.5	24 19 10.5	23.3	+ 28.2	75 25 59.9	+ 4.4
23	17 58	5.0	29.5	24.8	23.8	31	. .	030	. .	085	. .	32.5	18 2 53.1	. .	+ 20.3	69 9 34.6	+ 6.8
24	35 12	8.5	1.5	27.0	26.5	30	. .	240	. .	260	. .	32.5	35 17 2.8	. .	+ 44.1	86 24 8.1	+ 2.0
25	40 28	5.8	29.5	25.5	24.2	31	. .	790	. .	820	. .	32.5	40 32 41.0	. .	+ 53.3	91 39 55.5	− 0.5
26	48 6	6.9	29.5	23.2	24.0	35	. .	. .	. .	795	860	32.5	48 9 40.0	. .	+ 1 9.6	99 17 10.8	− 2.8
27	11 40	11.5	4.8	0.0	27.7	34	. .	. .	. .	745	775	32.5	11 43 51.6	. .	+ 13.0	62 50 25.8	+ 9.7
28	30 14	11.7	3.0	29.0	27.3	35	. .	005	. .	070	. .	32.5	30 17 47.6	. .	+ 36.5	81 24 45.3	+ 3.2
29	29 32	14.8	8.0	3.0	1.3	36	. .	725	. .	745	. .	32.5	29 35 17.6	. .	+ 35.5	80 42 14.3	+ 3.6
30	29 52	9.5	7.5	3.0	0.3	33	. .	810	. .	850	. .	32.5	29 56 3.7	. .	+ 36.0	81 3 0.9	+ 3.6
31	44 26	10.0	3.2	27.8	27.0	35	. .	810	. .	820	. .	32.5	44 29 36.3	. .	+ 1 1.4	95 36 58.9	− 1.2
32	15 6	14.0	7.3	2.8	29.6	33	. .	. .	. .	140	170	32.5	15 10 13.7	. .	+ 17.0	66 16 51.9	+ 2.0
33	7 18	9.1	3.3	29.5	26.5	31	. .	. .	. .	550	580	32.5	7 22 42.0	. .	+ 8.1	58 29 11.3	+ 1.2
34	16 42	9.2	2.3	27.8	25.7	33	. .	400	. .	420	. .	32.5	16 46 14.0	. .	+ 18.9	67 52 54.1	+ 8.7
35	52 40	11.2	4.0	0.0	27.1	33	. .	. .	. .	085	125	32.5	52 44 17.0	. .	+ 1 22.2	103 52 0.4	+ 2.3
36	15 4	10.7	4.4	0.3	28.0	35	. .	670	. .	705	. .	32.5	15 7 37.1	. .	+ 16.9	66 14 15.2	+ 9.4
37	25 46	8.3	3.2	28.7	26.0	33	. .	620	. .	640	. .	32.5	25 50 10.3	. .	+ 30.3	76 57 1.8	+ 5.7
38	33 38	7.7	0.6	26.4	24.6	37	. .	670	. .	740	. .	32.5	33 41 9.6	. .	+ 41.8	84 48 12.6	+ 3.0
39	76 6	11.4	4.5	28.0	28.1	32	. .	400	. .	430	. .	32.5	76 10 27.2	. .	+ 4 10.4	127 20 58.8	− 8.9
40	21 10	12.5	9.0	3.5	0.0	31	. .	055	. .	110	. .	32.5	21 14 44.7	. .	+ 24.4	72 21 30.3	+ 7.5
41	79 34	13.5	6.0	0.0	28.5	37	. .	940	. .	990	. .	32.5	79 37 0.6	. .	+ 5 32.3	130 48 54.1	− 9.2
42	74 42	14.0	7.2	2.8	0.2	37	820	. .	. .	. .	870	32.5	74 47 34.1	. .	+ 3 47.6	125 57 42.9	− 8.3
43	42 42	10.5	2.7	29.0	26.7	38	. .	700	. .	715	. .	32.5	42 44 51.8	. .	+ 58.0	93 52 11.0	+ 0.3
44	16 6	12.3	6.3	2.6	28.5	32	. .	910	. .	860	. .	32.5	16 10 18.4	. .	+ 18.2	67 16 57.8	+ 9.4
45	78 20	14.8	8.3	2.0	0.5	34	. .	490	. .	580	. .	32.5	78 23 51.3	. .	+ 4 58.8	129 35 11.3	− 8.6
46	20 12	13.3	7.3	3.5	29.7	35	. .	465	. .	470	. .	32.5	20 15 37.9	. .	+ 23.2	71 22 22.3	+ 8.0
47	38 34	9.0	1.5	28.7	25.6	38	. .	140	. .	190	. .	32.5	38 37 1.2	. .	+ 50.2	89 44 12.6	+ 1.8
48	72 28	9.5	2.2	28.0	26.5	38	. .	090	. .	110	. .	32.5	72 31 1.6	. .	+ 3 17.8	123 40 40.6	− 6.8
49	78 32	13.0	6.5	0.2	28.3	32	. .	420	. .	385	. .	32.5	78 36 25.8	. .	+ 5 4.9	129 47 51.9	− 7.7
50	71 18	9.5	3.7	29.5	26.5	34	. .	560	. .	570	. .	32.5	71 21 55.0	. .	+ 3 5.2	122 31 21.4	− 6.4

No.	Barom.	At. Ther.
	in.	°
10	30.26	13.8
12	30.32	13.5
22	30.33	24.5

For summary of the elements of reduction see page 3.

No.	Parallax	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	° ' "
12	− 11.4	− 13.7	0.0	− 25.1
13	− 11.4	+ 13.7	. .	+ 2.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Feb. 16	1	B. A. C. 1742 . .	E.	51.7	54.5	56.1	2.8	5.0	7.3	14.0	15.7	18.5	28 5.07	− 0.46	. .	−14.76	5 27 49.82	− 0.72
	2	B. A. C. 1767 . .	E.	13.5	16.0	17.7	24.3	26.5	28.8	35.3	36.9	39.6	30 26.51	− 0.51	. .	−14.76	5 30 11.24	− 0.73
	3	B. A. C. 1792 . .	E.	10.2	11.8	16.0	18.2	20.3	22.4	24.5	28.9	30.5	34 20.31	− 0.52	. .	−14.76	5 34 5.03	− 0.74
	4	B. A. C. 1806 . .	E.	8.8	12.9	14.9	17.0	19.0	21.1	25.0	26.6	29.1	36 16.93	− 0.58	. .	−14.76	5 36 1.59	− 0.72
	5	B. A. C. 1859 . .	E.	50.7	52.5	57.5	59.9	2.4	4.9	7.3	12.0	14.0	44 2.36	− 0.76	. .	−14.75	5 43 46.85	− 0.88
	6	B. A. C. 1878 . .	E.	37.8	39.6	44.7	47.1	49.6	52.2	54.8	59.9	1.7	46 49.71	− 0.78	. .	−14.75	5 46 34.18	− 0.92
	7	B. A. C. 1922 . .	E.	7.9	11.0	12.9	20.4	22.9	25.5	32.8	34.7	37.9	53 22.79	− 0.77	. .	−14.74	5 53 7.28	− 0.94
	8	22 Camelopardalis	E.	46.8	54.0	58.1	15.6	21.3	27.3	44.5	48.7	56.1	5 21.38	− 0.12	. .	−14.80	6 5 6.46	+ 0.13
	9	δ Ursæ Minoris, S. P	E.	. .	52.0	18.7	42.8	8.5	. .	27.0	0.4	16.6	12 43.44	− 3.06	. .	−14.80	18 12 25.58	− 0.77
	10	B. A. C. 2066 . .	E.	37.8	39.4	44.2	46.8	49.4	51.6	54.0	59.0	0.7	17 49.21	− 0.76	. .	−14.74	6 17 33.71	− 1.01
	11	B. A. C. 2112 . .	E.	5.3	7.0	11.8	14.3	16.6	19.0	21.5	26.3	28.0	24 16.64	− 0.75	. .	−14.74	6 24 1.15	− 1.03
	12	B. A. C. 2141 . .	E.	16.5	19.7	21.5	29.2	31.8	34.4	42.0	43.9	47.0	27 31.78	− 0.78	. .	−14.73	6 27 16.27	− 1.08
	13	B. A. C. 2164 . .	E.	12.4	15.6	17.5	24.8	27.3	29.7	37.3	39.0	42.2	30 27.31	− 0.76	. .	−14.73	6 30 11.82	− 1.06
	14	B. A. C. 2195 . .	E.	42.8	45.8	47.9	55.5	58.0	0.7	8.5	10.5	13.7	35 58.16	− 0.79	. .	−14.73	6 35 42.64	− 1.12
	15	51 Cephei	E.	28.5	0.1	24.5	7.0	19.5	32.4	13.6	38.5	10.0	41 49.34	+ 2.65	. .	−14.79	6 41 37.20	+ 0.69
	16	50 Draconis, S. P. .	E.	24.5	14.0	8.0	44.0	35.9	27.8	3.7	57.8	47.6	50 35.92	− 1.08	. .	−14.79	18 50 20.05	+ 0.68
	17	ε Canis Majoris. .	E.	45.4	48.2	50.0	57.0	59.4	1.8	8.6	10.4	13.3	53 59.34	− 0.73	−14.68	−14.79	6 53 43.82	− 0.16
	18	δ Canis Majoris. .	E.	21.5	24.4	25.9	32.9	35.2	37.4	44.3	45.9	48.7	3 35.13	− 0.71	−14.76	−14.79	7 3 19.63	− 0.08
	19	B. A. C. 2385 . .	E.	1.0	3.9	5.6	12.8	15.3	17.6	24.9	26.5	29.5	9 15.23	− 0.74	. .	−14.72	7 8 59.77	− 1.15
	20	δ Geminorum . .	E.	42.7	45.5	47.0	53.6	55.9	58.1	4.7	6.4	9.1	12 55.89	− 0.50	−14.71	−14.79	7 12 40.60	− 0.14
	21	B. A. C. 2446 . .	E.	51.8	54.6	56.5	3.7	6.0	8.4	15.6	17.4	20.5	18 36.06	− 0.75	. .	−14.71	7 18 20.60	− 1.18
	22	Moon I, N. . .	E.	17.4	20.3	22.2	29.1	31.5	33.8	40.9	42.6	45.5	21 31.59	− 0.48	. .	−14.71	7 21 16.40	+74.38
17	23	B. A. C. 1253 . .	F.	55.0	57.8	59.4	6.0	8.2	10.5	17.2	18.7	21.8	57 8.29	− 0.50	. .	−14.50	3 56 53.29	− 0.08
	24	Groom. 2320, S. P.	F.	. .	. .	26.4	21.0	15.4	9.7	4.3	. .	. .	6 15.36	− 1.11	. .	−14.53	16 5 59.72	+ 0.18
	25	B. A. C. 1333 . .	F.	10.8	13.8	15.8	23.1	25.7	28.0	35.6	37.3	40.4	13 25.61	− 0.79	. .	−14.50	4 13 10.32	− 0.45
	26	B. A. C. 1365 . .	F.	17.9	20.7	22.2	28.6	30.9	33.0	39.4	41.0	43.7	18 30.82	− 0.53	. .	−14.50	4 18 15.79	− 0.24
	27	ε Tauri	F.	21.6	24.2	25.8	32.3	34.4	36.6	43.0	44.7	47.4	21 34.44	− 0.52	−14.53	−14.53	4 21 19.39	− 0.01
	28	α Tauri	F.	47.5	50.2	51.8	58.2	0.4	2.5	8.8	10.3	13.0	29 0.30	− 0.54	−14.48	−14.53	4 28 45.23	− 0.07
	29	B. A. C. 1431 . .	F.	50.4	53.0	54.5	0.6	2.6	4.7	10.9	12.4	14.9	31 2.67	− 0.61	. .	−14.50	4 30 47.56	− 0.37
	30	B. A. C. 1449 . .	F.	46.7	49.5	51.1	57.7	59.9	2.2	8.9	10.5	13.2	34 59.97	− 0.50	. .	−14.50	4 34 44.97	− 0.34
	31	ι Aurigæ. . . .	F.	52.0	55.1	57.0	4.3	6.6	9.0	16.5	18.2	21.3	49 6.67	− 0.45	−14.50	−14.53	4 48 51.69	− 0.07
	32	B. A. C. 1564 . .	F.	40.6	43.5	45.4	52.5	54.9	57.3	4.7	6.4	9.5	57 54.98	− 0.78	. .	−14.51	4 57 39.69	− 0.65
	33	B. A. C. 1573 . .	F.	55.6	58.7	0.8	8.1	10.7	13.1	20.7	22.5	25.8	0 10.67	− 0.80	. .	−14.51	4 59 55.36	− 0.69
	34	B. A. C. 1742 . .	F.	. .	. .	0.2	2.5	4.9	7.2	9.5	. .	. .	28 4.86	− 0.50	. .	−14.51	5 27 49.85	− 0.71
	35	B. A. C. 1762 . .	F.	. .	. .	30.8	32.9	35.0	37.0	39.2	. .	. .	29 34.98	− 0.64	. .	−14.51	5 29 19.83	− 0.68
	36	B. A. C. 1767 . .	F.	. .	. .	. .	. .	. .	30.6	35.0	36.6	39.5	30 26.24	− 0.51	. .	−14.51	5 30 11.22	− 0.72
	37	B. A. C. 1792 . .	F.	. .	. .	17.9	. .	. .	24.3	. .	30.1	32.8	34 20.01	− 0.54	. .	−14.51	5 34 4 96	− 0.72
	38	δ Ursæ Minoris, S. P	F.	. .	. .	52.0	19.0	13.0	9.5	34.0	. .	. .	12 43.50	− 4.27	. .	−14.51	18 12 24.72	− 0.35
	39	B. A. C. 2077 . .	F.	27.5	30.7	32.6	. .	. .	. .	53.0	54.8	57.9	19 42.75	− 0.81	. .	−14.52	6 19 27.42	− 1.04
	40	B. A. C. 2136 . .	F.	47.3	50.4	52.4	59.8	2.2	4.8	12.2	14.0	17.2	27 2.26	− 0.80	. .	−14.52	6 26 46.94	− 1.04
	41	B. A. C. 2183 . .	F.	. .	. .	. .	. .	. .	. .	32.6	34.4	37.5	33 22.98	− 0.78	. .	−14.52	6 33 7.68	− 1.04
	42	B. A. C. 2194 . .	F.	. .	. .	. .	. .	32.8	35.1	39.6	41.2	44.1	36 30.53	− 0.49	. .	−14.52	6 36 15.52	− 1.15
	43	51 Cephei	F.	. .	. .	. .	3.0	17.0	30.0	10.5	. .	. .	41 46.38	+ 3.98	. .	−14.51	6 41 35.85	− 0.43
	44	α² Geminorum . .	F.	39.3	42.4	44.2	51.2	53.8	56.2	3.5	5.1	8.2	26 53.77	− 0.45	−14.50	−14.50	7 26 38.82	+ 0.24
	45	α Canis Minoris. .	F.	49.0	52.0	53.6	59.7	1.7	3.8	10.0	11.5	14.0	33 1.77	− 0.58	−14.56	−14.50	7 32 46.69	− 0.10
	46	β Geminorum . .	F.	42.4	45.4	47.1	54.0	56.4	58.8	5.6	7.4	10.4	37 56.39	− 0.47	−14.52	−14.50	7 37 41.42	− 0.01
	47	Moon I, N. . .	F.	41.9	44.7	46.5	53.5	55.7	57.9	4.8	6.5	9.4	22 55.66	− 0.50	. .	−14.53	8 22 40.63	+71.87
	48	γ Aquilæ. . . .	S.	20.6	23.0	25.0	30.9	33.0	35.1	41.3	42.9	45.6	40 33.04	− 0.54	−14.49	−14.45	19 40 18.05	+ 0.07
	49	α Aquilæ. . . .	S.	42.8	45.4	46.8	52.9	55.0	57.1	3.3	4.9	7.5	44 55.08	− 0.54	−14.49	−14.45	19 44 40.09	+ 0.08

4. Telescope micrometer reading decreased one revolution in reduction. Transits commence at wire B_3.
9, 24. Bisections at sets B and D.
35. Bisections at set C.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ′	″
1	14 52	10 9.5	3.8	1.0	26.7	34	. .	360	. .	440	. .	32.5	14 55 57.4	. .	+ 16.8	66 2 35.4	+ 9.6
2	17 46	12.0	6.5	3.3	29.2	36	. .	700	. .	710	. .	32.5	17 49 19.6	. .	+ 20.3	68 56 1.1	+ 8.6
3	22 22	9.3	3.5	0.8	26.9	37	. .	790	. .	800	. .	32.5	22 25 5.5	. .	+ 26.0	73 31 52.7	+ 7.1
4	37 24	13.3	5.0	1.0	28.8	34	. .	790	. .	810	. .	32.5	37 28 4.7	. .	+ 48.3	88 35 14.2	+ 2.4
5	72 14	11.0	5.4	0.0	27.7	30	. .	780	. .	815	. .	32.5	72 18 51.5	. .	+ 3 15.9	123 28 28.6	− 6.1
6	74 36	7.6	0.2	24.6	24.8	38	. .	415	. .	420	. .	32.5	74 38 59.0	. .	+ 3 46.8	125 49 7.0	− 6.4
7	74 4	12.2	5.0	0.0	28.2	34	. .	215	. .	260	. .	32.5	74 7 58.4	. .	+ 3 39.4	125 17 59.0	− 6.2
8	329 28	10.3	3.9	0.3	28.6	32	. .	850	. .	900	. .	32.5	329 32 21.0	15.0	− 37.2	20 38 5.0	+ 1.6
9	305 28	7.8	1.1	27.5	25.5	37	440	. .	560	. .	480	32.5	305 31 11.3	. .	− 1 28.4	356 36 4.1	+ 1.1
10	72 8	9.1	1.2	28.0	25.8	30	. .	480	. .	490	. .	32.5	72 12 58.7	. .	+ 3 15.2	123 22 35.1	− 5.3
11	71 4	9.4	3.1	27.0	26.3	33	. .	500	. .	550	. .	32.5	71 8 11.8	. .	+ 3 3.5	122 17 36.5	− 5.0
12	75 36	11.3	3.8	28.1	26.6	30	. .	685	. .	715	. .	32.5	75 40 54.0	. .	+ 4 4.0	126 51 19.2	− 5.6
13	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
14	76 48	10.8	6.1	0.0	27.9	34	. .	290	. .	300	. .	32.5	76 51 57.7	. .	+ 4 26.2	128 2 45.1	− 5.5
15	311 36	8.2	2.2	28.1	25.8	32	845	. .	830	. .	900	32.5	311 40 22.7	. .	− 1 11.1	2 45 32.8	− 1.0
16	29 48	8.0	2.0	27.0	26.3	31	. .	410	. .	460	. .	32.5	294 12 43.4	. .	− 2 20.2	345 16 44.4	+ 0.9
17	67 36	9.8	4.1	29.8	28.3	36	. .	760	. .	675	. .	32.5	67 39 21.4	. .	+ 2 33.2	118 48 15.8	+ 0.2
18	65 0	10.5	2.5	28.9	27.2	37	. .	190	. .	180	. .	32.5	65 3 15.0	. .	+ 2 15.7	116 11 51.9	+ 4.3
19	69 40	12.2	4.5	0.7	28.8	37	. .	630	. .	620	. .	32.5	69 43 6.4	. .	+ 2 50.2	120 52 17.8	− 3.9
20	16 36	10.2	5.0	2.2	27.3	31	. .	790	. .	815	. .	32.5	16 40 36.3	. .	+ 19.0	67 47 16.5	+ 1.2
21	70 36	11.6	4.5	28.9	27.8	37	. .	255	. .	310	. .	32.5	70 39 12.5	. .	+ 2 59.3	121 48 33.0	− 3.8
22	11 30	7.5	1.9	28.5	26.4	37	600	520	400	330	155	32.5	11 33 13.2	13.0	+ 13.0	62 39 47.4	. .
23	15 4	16.7	9.0	0.0	2.8	35	. .	188	. .	214	. .	31.6	15 7 39.9	35.4	+ 16.2	66 14 17.3	+ 9.4
24	287 2	13.2	9.6	3.0	4.7	38	. .	494	. .	486	. .	31.6	287 4 48.8	. .	− 3 13.6	338 7 56.4	+ 2.5
25	72 52	7.9	1.8	20.7	26.9	30	. .	800	. .	946	. .	31.6	72 56 53.6	. .	+ 3 14.3	124 6 29.1	− 8.2
26	21 10	12.5	7.4	1.2	29.6	31	. .	. .	. .	100	110	31.6	21 14 44.9	. .	+ 23.4	72 21 29.3	+ 7.5
27	19 56	11.7	4.6	28.3	28.2	37	. .	. .	. .	686	682	31.6	19 59 6.1	. .	+ 22.0	71 5 49.3	+ 2.9
28	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
29	38 4	9.9	2.7	23.8	26.7	33	. .	204	. .	226	. .	31.6	38 8 16.5	. .	+ 47.5	89 15 25.1	+ 1.8
30	16 6	12.9	5.7	0.3	29.7	32	800	810	. .	. .	. .	31.6	16 10 18.8	. .	+ 17.6	67 16 57.6	+ 9.4
31	5 52	13.7	6.5	1.2	29.8	36	. .	418	. .	426	. .	31.6	5 55 23.0	. .	+ 6.3	57 1 50.5	+ 1.5
32	70 44	10.5	29.8	4.3	25.8	33	740	758	. .	. .	. .	31.6	70 48 5.8	. .	+ 2 53.2	121 57 20.2	− 6.9
33	74 26	9.1	0.1	22.3	23.8	36	. .	320	. .	318	. .	31.6	74 29 30.7	30.0	+ 3 36.2	125 39 28.1	− 7.6
34	14 52	14.5	8.9	3.7	2.5	33	956	980	. .	. .	. .	31.6	14 55 58.2	. .	+ 16.3	66 2 35.7	+ 9.6
35	44 48	8.6	8.9	25.9	23.9	33	374	. .	. .	. .	390	31.6	44 52 12.9	. .	+ 1 0.7	95 59 34.8	+ 0.1
36	17 46	8.5	1.3	24.7	24.5	36	. .	. .	. .	988	994	31.6	17 49 20.2	. .	+ 19.6	68 56 1.0	+ 8.6
37	22 22	8.6	1.6	26.0	26.1	37	. .	. .	. .	804	800	31.6	22 25 6.9	. .	+ 25.8	73 31 53.9	+ 7.1
38	305 28	7.6	1.5	22.6	26.2	37	774	772	772	776	776	31.6	305 31 7.9	. .	− 1 25.7	356 36 3.4	+ 0.6
39	75 42	7.4	28.7	22.5	23.5	31	. .	. .	. .	. .	732	31.6	75 46 41.8	26.2	+ 3 58.1	126 57 1.1	− 5.9
40	73 56	10.9	1.1	25.3	26.0	32	. .	290	. .	286	. .	31.6	74 0 30.4	. .	+ 3 31.5	125 10 23.1	− 5.5
41	71 0	14.3	6.5	29.5	29.1	30	. .	. .	. .	680	686	31.6	71 4 51.2	. .	+ 2 57.6	122 14 10.0	− 5.0
42	13 34	14.0	7.5	0.6	29.8	33	. .	. .	. .	540	558	31.6	13 38 7.2	. .	+ 14.9	64 44 43.3	+ 8.4
43	311 36	6.9	1.6	27.5	26.4	32	. .	932	918	908	. .	31.6	311 40 21.2	. .	− 1 9.0	2 45 33.4	− 0.1
44	6 40	14.3	8.7	2.4	0.6	34	. .	856	. .	860	. .	31.6	6 43 45.8	. .	+ 7.3	57 50 14.3	0.0
45	33 16	7.7	1.3	25.4	25.6	33	026	026	. .	. .	. .	31.6	33 20 19.8	. .	+ 40.6	84 27 21.6	+ 0.3
46	10 30	11.6	5.9	29.5	29.5	34	. .	888	. .	892	. .	31.6	10 33 47.6	22.8	+ 11.5	61 40 20.3	+ 1.7
47	14 20	16.6	10.4	4.8	2.9	32	. .	. .	138	. .	. .	31.6	14 24 25.0	21.2	+ 16.0	65 31 2.2	. .
48	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	.
49	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	15.8	. .	. . . .	. .

No.	Barom.	At. Ther.
	in.	°
8	30.23	20.0
22	30.23	17.0
23	30.01	37.0
33	30.05	32.5
39	30.06	28.0
46	30.07	25.5
47	30.10	24.2
49	30.26	16.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
22	−11 25.2	+ 15 50.1	. .	+ 4 24.9
47	−14 7.4	+ 15 42.7	. .	+ 1 35.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Feb. 18	1	Sun I	S.	9.0	11.6	13.0	19.6	21.4	23.7	29.9	31.4	34.3	6 21.54	− 0.64	. .	−14.45	22 6 6.45	. .
	2	Sun II	S.	21.8	24.5	26.0	32.3	34.5	36.3	42.4	44.0	46.9	8 34.30	− 0.61	. .	−14.45	22 8 19.21	. .
	3	Mercury I	S.	31.3	32.9	37.0	39.0	41.0	42.9	45.0	49.0	50.6	6 40.97	− 0.60	. .	−14.44	23 6 25.93	+ 0.28
	4	α Andromedæ	S.	55.4	58.0	59.8	6.9	9.1	11.5	18.6	20.3	23.2	2 9.20	− 0.45	−14.40	−14.41	0 1 54.34	+ 0.01
	5	Polaris	S.	. .	. .	. .	. .	. .	35.0	4.0	58.0	59.5	12 9.68	+ 6.67	. .	−14.40	1 12 1.95	− 1.12
	6	α Ceti	S.	47.2	49.6	51.3	57.5	59.5	1.6	7.7	9.1	11.9	55 59.49	− 0.53	−14.35	−14.38	2 55 44.58	− 0.01
	7	B. A. C. 1037	S.	59.4	2.0	3.7	10.5	12.6	14.8	21.5	23.0	26.0	14 12.61	− 0.66	. .	−14.37	3 13 57.58	− 0.05
	8	B. A. C. 1057	S.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	9	B. A. C. 1100	S.	5.2	7.8	9.3	15.5	17.6	19.6	25.9	27.5	30.0	27 17.60	− 0.60	. .	−14.37	3 27 2.63	− 0.06
	10	B. A. C. 1149	S.	43.6	46.5	48.0	54.8	57.0	59.3	6.0	7.7	10.6	37 57.06	− 0.44	. .	−14.37	3 37 42.25	+ 0.08
	11	γ^1 Eridani	S.	14.5	17.0	18.7	25.0	27.1	29.2	35.5	37.0	39.8	52 27.09	− 0.62	−14.36	−14.38	3 52 12.09	+ 0.02
	12	B. A. C. 1310	S.	18.0	21.4	23.2	31.4	34.2	37.0	45.1	47.0	50.5	9 34.20	− 0.79	. .	−14.36	4 9 19.05	− 0.46
	13	ε Tauri	S.	21.2	23.9	25.4	32.0	34.2	36.4	42.7	44.5	47.1	21 34.16	− 0.46	−14.33	−14.37	4 21 19.33	− 0.05
	14	α Tauri	S.	. .	. .	55.8	58.0	0.1	2.3	4.4	. .	. .	29 0.12	− 0.48	−14.38	−14.37	4 28 45.27	− 0.01
	15	B. A. C. 1440	S.	14.7	17.8	19.5	26.5	29.0	31.4	38.5	40.2	43.4	32 29.00	− 0.71	. .	−14.35	4 32 13.94	− 0.50
	16	B. A. C. 1467	S.	20.9	23.8	25.5	32.9	35.3	37.5	44.8	46.6	49.5	38 35.20	− 0.71	. .	−14.35	4 38 20.14	− 0.53
	17	B. A. C. 1564	S.	40.5	43.4	45.3	52.3	54.7	57.2	4.4	6.3	9.3	57 54.82	− 0.72	. .	−14.35	4 57 39.75	− 0.63
21	18	B. A. C. 6082	S.	55.8	59.0	1.0	8.7	11.1	13.5	21.4	23.4	26.6	52 11.17	− 0.27	. .	−13.60	17 51 57.30	+ 0.59
	19	η Serpentis	S.	. .	. .	2.0	4.2	6.2	8.2	12.2	14.0	16.5	15 4.15	− 0.48	−13.69	−13.56	18 14 50.11	+ 0.19
	20	α Lyræ	S.	39.7	42.9	44.8	52.7	55.2	57.9	5.8	7.7	10.9	32 55.29	− 0.26	−13.57	−13.56	18 32 41.47	+ 0.03
	21	β Lyræ	S.	. .	. .	. .	. .	. .	. .	50.7	52.4	55.6	45 40.88	− 0.30	−13.61	−13.55	18 45 27.03	+ 0.09
	22	ζ Aquilæ	S.	40.5	43.0	44.7	50.9	53.0	55.2	1.4	3.0	5.8	59 53.06	− 0.40	−13.56	−13.55	18 59 39.11	+ 0.09
	23	Venus, S.	S.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	24	Venus II, N.	S.	. .	. .	57.8	0.0	2.1	4.2	6.3	. .	. .	12 2.08	− 0.56	. .	−13.57	19 11 47.95	− 0.85
	25	γ Aquilæ	S.	22.3	23.8	27.9	30.0	32.0	34.1	36.2	40.4	41.9	40 32.07	− 0.42	−13.55	−13.54	19 40 18.11	+ 0.04
	26	α Aquilæ	S.	41.7	44.3	45.9	52.0	54.0	56.2	2.3	3.9	6.5	44 54.09	− 0.42	−13.53	−13.54	19 44 40.13	+ 0.03
	27	B. A. C. 7022	S.	40.8	44.0	46.0	54.0	56.7	59.4	7.5	9.5	12.8	17 56.74	− 0.25	. .	−13.56	20 17 42.93	+ 1.64
	28	α Cephei	S.	20.0	25.1	28.4	41.6	45.9	50.5	3.6	6.6	12.0	15 45.97	+ 0.02	. .	−13.53	21 15 32.46	+ 0.18
22	29	Sun I, N.	S.	27.8	30.5	31.9	38.2	40.3	42.4	48.7	50.1	52.8	21 40.30	− 0.51	. .	−13.54	22 21 26.25	. .
	30	Sun II, S.	S.	39.9	42.5	44.0	50.2	52.3	54.4	0.5	2.3	4.7	23 52.31	− 0.51	. .	−13.54	22 23 38.26	. .
	31	α Andromedæ	S.	54.2	57.0	58.9	5.7	8.0	10.4	17.4	19.2	22.0	2 8.09	− 0.33	− 13.43	−13.50	0 1 54.26	− 0.05
	32	γ Pegasi	S.	48.2	50.8	52.4	58.7	0.7	2.9	9.2	10.7	13.5	7 0.79	− 0.40	−13.48	−13.50	0 6 46.89	− 0.02
	33	B. A. C. 166	S.	37.0	40.0	41.9	48.9	51.2	53.5	0.7	2.5	5.5	32 51.24	− 0.32	. .	−13.44	0 32 37.48	+ 1.36
	34	B. A. C. 334	S.	41.8	44.7	46.6	54.1	56.6	59.0	6.6	8.9	11.6	2 56.66	− 0.28	. .	−13.43	1 2 42.95	+ 1.34
	35	Polaris	S.	. .	. .	10.0	36.0	4.5	28.5	57.5	. .	. .	12 3.30	+10.99	. .	−13.49	1 12 0.80	+ 0.86
	36	δ Persei	S.	57.0	0.8	3.0	12.1	15.0	18.1	27.3	29.4	33.3	34 15.11	− 0.21	. .	−13.46	3 34 1.44	+ 0.10
	37	η Tauri	S.	3.6	6.4	8.0	14.7	17.0	19.2	25.9	27.6	30.4	40 16.98	− 0.37	−13.38	−13.46	3 40 3.15	− 0.08
	38	ζ Persei	S.	15.9	18.8	20.6	27.8	30.2	32.6	39.7	41.6	44.6	46 30.20	− 0.33	−13.36	−13.46	3 46 16.41	− 0.11
	39	γ^1 Eridani	S.	13.5	16.2	17.6	24.0	26.1	28.2	34.5	36.0	38.7	52 26.09	− 0.53	−13.52	−13.46	3 52 12.10	+ 0.10
	40	B. A. C. 1253	S.	. .	. .	2.5	4.7	6.9	9.2	11.4	. .	. .	57 6.94	− 0.37	. .	−13.42	3 56 53.15	+ 0.01
	41	B. A. C. 1275	S.	. .	. .	. .	. .	. .	. .	25.0	26.7	29.4	2 16.72	− 0.42	. .	−13.42	4 2 2.88	− 0.08
	42	B. A. C. 1312	S.	25.2	28.5	30.3	38.0	40.6	43.3	51.0	52.8	56.0	9 40.63	− 0.64	. .	−13.42	4 9 26.57	− 0.34
	43	γ Tauri	S.	42.2	44.9	46.5	52.8	54.9	57.0	3.4	4.9	7.6	12 54.91	− 0.41	−13.48	−13.45	4 12 41.04	+ 0.03
	44	B. A. C. 1368	S.	32.0	35.3	37.0	44.7	47.2	49.9	57.3	59.2	2.4	18 47.22	− 0.63	. .	−13.42	4 18 33.17	− 0.38
	45	B. A. C. 1407	S.	6.9	9.9	11.8	19.3	21.9	24.5	31.9	33.7	37.0	26 21.88	− 0.63	. .	−13.41	4 26 7.84	− 0.41
	46	B. A. C. 1440	S.	13.9	16.8	18.6	25.7	28.0	30.4	37.4	39.3	42.4	32 28.06	− 0.60	. .	−13.41	4 32 14.05	− 0.41
	47	B. A. C. 1739	S.	46.6	49.6	51.5	59.0	1.5	5.9	11.6	13.2	16.6	27 1.50	− 0.62	. .	−13.40	5 26 47.48	− 0.70
	48	B. A. C. 1771	S.	39.6	42.6	44.6	51.8	54.3	56.5	3.9	6.0	8.9	30 54.24	− 0.61	. .	−13.40	5 30 40.23	− 0.70
	49	B. A. C. 1814	S.	46.4	49.4	57.2	58.8	1.3	3.7	11.0	13.0	16.0	38 1.20	− 0.62	. .	−13.40	5 37 47.18	− 0.75
	50	B. A. C. 1865	S.	9.6	12.6	14.2	21.3	23.7	26.0	33.0	35.0	37.9	45 23.70	− 0.60	. .	−13.40	5 45 9.70	− 0.75
	51	B. A. C. 1904	S.	47.4	50.8	52.8	0.7	3.7	6.2	14.2	16.3	19.5	51 3.51	− 0.65	. .	−13.40	5 50 49.46	− 0.84

48. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° '	r. ''	''	''	''							''	° ' ''	°	' ''	° ' ''	''
1	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
2	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
3	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
4	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
5	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
6	35 12	10 2.8	25.1	15.2	20.2	30	. .	752	. .	848	. .	32.6	35 17 2.0	21.8	+ 44.1	86 24 7.3	+ 1.1
7	61 0	5.3	28.5	20.3	23.0	31	. .	746	. .	772	. .	32.6	61 4 43.7	. .	+ 1 52.7	112 12 57.6	− 6.5
8	30 14	3.2	25.7	18.6	20.9	35	. .	. .	. .	. .	670	32.6	30 17 46.6	. .	+ 36.6	81 24 44.4	+ 3.2
9	48 42	4.3	28.3	20.2	22.1	36	. .	690	. .	724	. .	32.6	48 45 28.5	. .	+ 1 11.3	99 53 1.0	− 2.7
10	14 22	3.8	27.6	20.2	23.1	32	. .	590	. .	658	. .	32.6	14 26 31.4	. .	+ 16.1	65 33 9.7	+ 9.2
11	52 40	3.2	26.2	16.7	20.5	33	. .	670	. .	728	. .	32.6	52 44 16.6	. .	+ 1 22.3	103 52 0.1	+ 2.0
12	79 24	1.4	24.5	14.8	19.1	31	. .	020	. .	190	. .	32.6	79 28 57.8	18.8	+ 5 28.5	130 40 47.5	− 9.6
13	19 56	3.6	28.4	22.2	22.3	38	. .	230	. .	260	. .	32.6	19 59 4.7	. .	+ 22.9	71 5 48.8	+ 2.4
14	22 34	2.4	26.2	19 0	21.2	35	. .	747	. .	783	. .	32.6	22 37 44.6	. .	+ 26.2	73 44 32.0	+ 2.0
15	69 28	4.3	26.3	15.1	21.9	34	. .	716	. .	742	. .	32.6	69 32 0.5	. .	+ 2 47.3	120 41 9.0	− 7.2
16	69 46	2.7	26.1	15.1	20.8	31	. .	137	. .	217	. .	32.6	69 50 55.6	. .	+ 2 50.2	121 0 7.0	− 7.1
17	70 44	1.6	24.8	14.3	20.5	34	. .	565	. .	609	. .	32.6	70 48 4.3	. .	+ 2 59.5	121 57 25.0	− 6.9
18	1 34	. .	29.8	. .	22.7	34	. .	805	. .	807	. .	32.5	1 37 56.3	. .	+ 1.8	52 44 19.3	−25.1
19	41 44	. .	28.6	. .	22.4	31	. .	. .	. .	. .	640	32.5	41 48 45.6	27.1	+ 55.2	92 56 2.0	+ 1.9
20	0 10	. .	0.9	. .	24.0	34	. .	. .	. .	857	877	32.5	0 13 54.6	. .	+ 0.3	51 20 16.1	− 1.1
21	5 36	. .	28.8	. .	22.0	31	. .	. .	. .	662	618	32.5	5 40 46.0	. .	+ 6.1	56 47 13.3	+ 1.5
22	25 8	. .	1.5	. .	24.3	31	. .	. .	. .	586	628	32.5	25 12 43.8	33.0	+ 28.7	76 19 33.7	+ 1.1
23	58 20	. .	28.1	. .	22.1	33	356	. .	. .	. .	438	32.5	58 21 18.5	34.4	+ 1 38.6	109 32 18.3	. .
24	58 20	. .	28.1	. .	22.1	34	. .	979	. .	019	. .	32.5	58 23 54.1	. .	+ 1 38.6	109 31 53.9	. .
25	28 30	4.8	28.0	21.3	22.1	31	. .	602	. .	652	. .	32.5	28 34 46.0	. .	+ 33.0	79 41 40.2	+ 0.4
26	30 16	5.0	29.3	23.5	22.5	30	. .	822	. .	872	. .	32.5	30 20 56.9	36.4	+ 35.6	81 27 53.7	+ 0.8
27	358 58	4.0	28.6	22.9	23.3	32	. .	590	. .	656	. .	32.5	359 2 30.3	. .	− 1.0	50 8 50.5	−18.0
28	336 46	1.7	27.1	18.7	21.6	31	168	. .	082	. .	170	32.5	336 50 56.1	42.1	− 25.6	27 56 51.7	+ 1.0
29	48 42	12.5	7.5	2.0	29.2	35	962	030	. .	. .	. .	32.5	48 45 29.4	47.4	+ 1 7.5	99 52 58.1	. .
30	49 14	6.4	0.7	25.8	22.6	35	. .	. .	. .	108	156	32 5	49 17 50.6	. .	+ 1 8.8	100 25 20.6	. .
31	10 26	5.1	28.4	21.3	22.1	36	. .	548	. .	566	. .	32.5	10 29 30.5	51.3	+ 10.9	61 36 2.6	+ 3.4
32	24 20	9.7	1.3	23.7	24.0	34	. .	444	. .	490	. .	32.5	24 23 59.4	. .	+ 26.6	75 30 47.2	+ 3.4
33	8 38	4.4	0.3	24.5	24.6	30	. .	879	. .	929	. .	32.5	8 42 55.3	. .	+ 9.0	59 49 25.5	+ 1.7
34	3 52	4.6	3.8	22.7	24.7	34	. .	043	. .	069	. .	32.5	3 56 6.6	. .	+ 4.0	55 2 31.8	+ 5.0
35	310 12	3.2	2.0	22.3	25.2	34	520	. .	530	. .	580	32.5	310 15 59.9	54.0	− 1 8.8	1 21 12.3	+ 3.6
36	351 26	10.4	1.8	20.5	23.6	32	. .	890	. .	890	. .	30.8	351 30 22.7	47.6	− 8.9	42 36 35.0	− 0.2
37	15 6	11.6	6.1	20.4	25.9	33	. .	350	. .	420	. .	30.8	15 10 13.0	. .	+ 16.0	66 16 50.2	0.0
38	7 18	12.6	9.2	23.9	27.1	31	. .	283	. .	263	. .	30.8	7 22 43.2	. .	+ 7.6	58 29 12.0	+ 1.7
39	52 40	10.6	1.2	17.1	21.8	32	. .	904	. .	916	. .	30.8	52 44 23.4	. .	+ 1 17.3	103 52 1.9	+ 3.7
40	15 4	10.2	3.4	21.7	23.0	35	. .	727	. .	723	. .	30.8	15 7 41.2	48.2	+ 15.9	66 14 18.3	+ 9.2
41	25 46	7.1	1.5	21.0	23.2	37	. .	. .	. .	507	541	30.8	25 49 12.7	. .	+ 28.5	76 56 2.4	+ 5.5
42	76 6	15.6	3.8	20.6	24.8	31	. .	231	. .	225	. .	30.8	76 10 45.5	. .	+ 3 55.5	127 21 2.2	− 9.0
43	23 30	10.8	1.5	19.9	24.4	35	. .	. .	. .	494	540	30.8	23 33 42.5	. .	+ 25.8	74 40 29.5	+ 3.1
44	74 36	7.3	29.3	19.5	22.8	32	. .	298	. .	390	. .	30.8	74 40 32.3	46.4	+ 3 32.4	125 50 25.9	− 8.6
45	74 42	10.0	1.1	20.4	24.5	35	. .	050	. .	106	. .	30.8	74 45 48.7	. .	+ 3 34.0	125 55 43.9	− 8.5
46	69 28	. .	0.4	. .	23.3	33	. .	642	. .	624	. .	30.8	69 32 11.5	45.1	+ 2 37.6	120 41 10.3	− 7.3
47	74 20	. .	0.0	. .	24.1	33	. .	810	. .	918	. .	30.8	74 24 7.7	41.9	+ 3 30.5	125 33 59.4	− 7.4
48	71 54	. .	29.5	. .	22.7	33	. .	692	. .	758	. .	30.8	72 0 43.2	. .	+ 3 1.8	123 10 6.2	− 6.9
49	73 30	. .	0.0	. .	22.5	33	. .	055	. .	085	. .	30.8	73 34 20.7	. .	+ 3 19.6	124 44 1.5	− 7.1
50	69 26	. .	29.9	. .	22.8	31	. .	790	. .	850	. .	30.8	69 30 40.2	. .	+ 2 38.3	120 39 39.7	− 6.2
51	78 44	. .	29.0	. .	21.8	35	. .	. .	. .	370	. .	30.8	78 47 46.5	. .	+ 4 52.9	129 59 0.6	− 7.7

No.	Barom.	At. Ther.
	in.	°
2	30.34	21.5
6	30.27	24.0
18	30.300	28.0
29	30.320	44 0
38	30.21	50.0
49	30.20	46.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' ''	' ''	' ''	' ''
23	− 10.6	− 12.2	0.0	− 22.8
24	− 10.6	+ 12.2	. .	+ 1.6
29	− 6.7	+ 16 11.2	. .	+ 16 4.5
30	− 6.8	− 16 11.2	. .	− 16 18.0

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan's Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Feb. 22	1	B. A. C. 1998 . .	S.	7.6	11.0	12.9	20.8	23.4	26.2	34.0	36.0	39.7	6 23.51	− 0.65	. .	−13.39	6 6 9.47	− 0.91
	2	δ Ursæ Minoris, S.P.	S.	. .	. .	. .	. .	. .	. .	28.5	2.8	18.2	12 45.61	− 3.69	. .	−13.44	18 12 28.48	+ 1.88
	3	B. A. C. 2035 . .	S.	27.2	30.4	32.3	40.3	42.9	45.6	53.5	55.0	58.7	12 42.88	− 0.64	. .	−13.39	6 12 28.85	− 0.93
	4	B. A. C. 2061 . .	S.	13.8	16.5	18.0	24.5	26.6	28.8	35.0	36.7	39.5	17 26.60	− 0.54	. .	−13.39	6 17 12.67	− 0.84
	5	B. A. C. 2098 . .	S.	45.4	48.8	50.8	58.9	1.9	4.3	12.3	14.4	17.7	22 1.61	− 0.60	. .	−13.39	6 21 47.56	− 0.98
	6	B. A. C. 2135 . .	S.	36.8	40.1	42.2	49.9	52.7	55.3	3.6	5.6	8.9	26 52.79	− 0.65	. .	−13.39	6 26 38.75	− 0.99
	7	γ Geminorum . .	S.	31.5	34.0	35.7	42.0	44.2	46.3	52.6	54.2	56.9	30 44.16	− 0.40	−13.34	−13.43	6 30 30.33	− 0.12
	8	α Canis Majoris . .	S.	40.6	43.1	44.9	51.1	53.2	55.4	1.8	3.4	6.0	39 53.28	− 0 54	−13.61	−13.43	6 39 39.31	+ 0.10
	9	51 Cephei	S.	. .	. .	. .	. .	. .	21.3	. .	3.0	58.5	41 41.31	+ 4.78	. .	−13.43	6 41 32.66	+ 0.01
	10	β Corvi	S.	. .	. .	0.1	2.2	4.5	6.8	8.9	. .	. .	28 4.50	− 0.59	−13.46	−13.37	12 27 50.54	+ 0.05
	11	Moon II . . .	S.	28.3	31.0	32.5	38.6	40.7	42.7	49.0	50.5	53.2	34 40.72	− 0.51	. .	−13.31	12 34 26.90	−61.92
	12	B. A. C. 4321 . .	S.	30.6	33.9	36.0	43.5	46.4	49.2	56.9	59.0	2.3	46 46.42	− 0.68	. .	−13.31	12 46 32.43	− 0.98
	13	12¹ Canum Venat. . .	S.	9.0	12.5	14.3	22.2	24.8	27.5	35.4	37.4	40.5	50 24.84	− 0.31	. .	−13.31	12 50 11.22	− 1.88
	14	12² Canum Venat. . .	S.	10.1	13.7	15.5	23.5	26.1	28.7	36.6	38.6	41.8	50 26.07	− 0.31	−13.20	−13.37	12 50 12.39	− 0.17
	15	B. A. C. 4374 . .	S.	45.0	48.3	50.4	58.5	1.2	3.7	11.9	13.7	17.2	58 1.10	− 0.69	. .	−13.31	12 57 47.10	− 0.93
	16	Polaris, S. P. (R.) .	S.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	17	Polaris, S. P. . .	S.	. .	. .	16.0	54.0	25.0	. .	. .	. .	. .	12 24.76	−10.83	. .	−13.36	1 12 0.57	+ 0.97
	18	Polaris, S. P. (R.) .	S.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	19	ζ Virginis . . .	S.	. .	. .	. .	. .	. .	. .	42.5	44.0	46.6	28 34.32	− 0.49	−13.34	−13.36	13 28 20.47	− 0.02
	20	B. A. C. 4601 . .	S.	59.5	3.0	4.9	13.0	15.7	18.2	26.5	28.7	31.8	42 15.70	− 0.70	. .	−13.30	13 42 1.70	− 0.74
	21	B. A. C. 4629¹ . .	S.	1.5	4.5	6.2	. .	. .	. .	25.5	27.0	30.2	46 15.82	− 0.64	. .	−13.30	13 46 1.88	− 0.74
	22	B. A. C. 4629² . .	S.	. .	. .	11.1	13.7	16.0	18.3	20.8	. .	. .	46 15.98	− 0.64	. .	−13.30	13 46 2.04	− 0.74
	23	50 Cassiopeæ, S. P. .	S.	38.5	29.4	24.8	6.2	59.2	52.9	33.0	28.3	19.8	52 59.12	− 1.20	. . .	−13.36	1 52 44.56	+ 0.31
	24	Jupiter I, S. . .	S.	39.2	41.8	43.4	. .	. .	. .	59.9	1.3	4.0	59 51.60	− 0.54	. .	−13.30	13 59 37.76	. .
	25	Jupiter II, N. . .	S.	. .	. . .	50.4	52.4	54.5	56.6	58.6	. .	. .	59 54.50	− 0.54	. .	−13.30	13 59 40.66	. .
	26	B. A. C. 4813 . .	S.	39.4	41.2	46.9	49.6	52.3	54.7	57.7	3.0	5.0	27 52.20	− 0.70	. .	−13.29	14 27 38.21	− 0.52
	27	α¹ Libræ	S.	. .	. .	56.6	58.8	0.9	3.0	5.3	. .	. .	44 0.92	− 0.56	. .	−13.29	14 43 47.07	− 0.54
	28	α² Libræ	S.	. .	. .	8.1	10.1	12.4	14.6	16.7	. .	. .	44 12.38	− 0.56	−13.36	−13.35	14 43 58.47	0.00
25	29	α Lyræ	S.	41.6	43.6	48.7	51.3	53.9	56.7	59.2	4.6	6.5	32 54.01	− 0.19	−12.24	−12.37	18 32 41.45	− 0.11
	30	β Lyræ	S.	24.9	27.9	29.8	37.1	39.5	42.1	49.2	51.0	54.0	45 39.50	− 0.10	−12.31	−12.36	18 45 27.04	− 0.02
	31	σ Sagittarii . . .	S.	. .	. .	. .	. .	44.9	47.1	51.6	53.2	56.0	47 42.46	+ 0.58	−12.73	−12.36	18 47 30.68	+ 0.38
	32	ζ Aquilæ	S.	38.9	41.6	43.1	49.4	51.5	53.6	59.9	1.5	4.0	59 51.50	+ 0.14	−12.44	−12.36	18 59 39.28	+ 0.16
	33	δ Draconis . . .	S.	9.9	16.6	20.4	36.5	41.9	47.0	2.9	7.0	13.6	12 41.76	− 1.14	. .	−12.35	19 12 28.27	− 0.34
	34	δ Aquilæ	S.	11.0	13.6	15.2	21.2	23.2	25.3	31.5	33.0	35.5	19 23.28	+ 0.26	−12.51	−12.35	19 19 11.19	+ 0.21
	35	B. A. C. 6690 . .	S.	38.3	41.2	43.0	49.9	52.2	54.4	1.4	3.0	6.0	25 52.16	− 0.03	. .	−12.32	19 24 39.81	+ 0.98
	36	Venus, S. . . .	S.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	37	Venus, N. . . .	S.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	38	γ Aquilæ	S.	17.9	20.5	22.0	28.3	30.4	32.5	38.7	40.3	42.8	40 30.38	+ 0.18	−12.37	−12.34	19 40 18.22	+ 0.06
	39	α Aquilæ	S.	. .	48.3	50.3	52.5	54.5	56.6	0.8	2.2	4.9	44 52.46	+ 0.20	−12.43	−12.34	19 40 40.32	+ 0.13
	40	B. A. C. 6934 . .	S.	50.4	53.0	54.5	0.6	2.6	4.7	10.8	12.3	14.8	5 2.63	+ 0.30	. .	−12.31	20 4 50.62	+ 0.84
	41	α² Capricorni . . .	S.	. .	. .	16.4	18.3	20.4	22.6	26.7	28.3	30.9	11 18.36	+ 0.42	−12.51	−12.34	20 11 6.44	+ 0.21
	42	B. A. C. 7022 . .	S.	39.4	42.8	44.7	52.7	55.4	58.0	6.0	8.0	11.4	17 55.38	− 0.21	. .	−12.31	20 17 42.86	+ 1.56
	43	α Cygni	S.	3.7	7.3	9.6	18.6	20.9	23.9	32.5	34.7	38.2	37 20.98	− 0.30	−12.27	−12.33	20 37 8.35	− 0.04
	44	ζ Cygni	S.	33.8	36.8	38.5	45.6	48.0	50.3	57.2	58.9	2.0	7 47.90	− 0.05	−12.33	−12.32	21 7 35.53	+ 0.02
	45	α Cephei	S.	19.3	24.8	27.4	40.0	45.3	49.8	2.7	5.9	11.5	15 45.34	− 0.83	. .	−12.32	21 15 32.19	− 0.17
	46	β Cephei	S.	35.0	42.8	47.0	4.0	11.0	16.9	34.8	39.0	46.5	27 10.88	− 1.31	. .	−12.31	21 26 57.23	− 0.32
	47	ε Pegasi	S.	1.5	4.0	5.6	11.8	13.8	15.9	22.0	23.7	26.3	38 13.84	+ 0.19	−12.35	−12.31	21 38 1.72	+ 0.05
26	48	Sun I, N. . . .	S.	35.2	38.0	39.5	45.7	47.8	49.8	56.0	57.6	0.3	36 47.77	+ 0.38	. .	−12.26	22 36 35.89	. .
	49	Sun II, S. . . .	S.	46.7	49.0	50.7	56.9	59.0	1.0	7.3	8.8	11.5	38 58.99	+ 0.38	. .	−12.26	22 38 47.11	. .
	50	α Andromedæ . .	S.	52.7	55.5	57.3	4.2	6.5	8.8	15.8	17.5	20.4	2 6.52	− 0.04	−12.16	−12.27	0 1 54.21	− 0.09

11, 27. Wire B used.
16. Bisections at equal intervals between C_5 and D_1.
18. Bisections at wires B_2 and B_3 and midway.
23. Bisections at wires B_1, C_1, and C_3.
33, 45. Bisections at sets B and D.
34. Wire A used.
46. Telescope micrometer reading increased five revolutions in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	79 4	9	28.5	. .	21.6	31	. .	803	. .	793	. .	30.8	79 8 41.3	. .	+ 5 2.1	130 20 4.6	− 7.4
2	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
3	77 58	10	3.6	. .	25.5	32	. .	575	. .	613	. .	30.8	78 2 24.6	. .	+ 4 34.8	129 13 20.6	− 7.1
4	56 42	. .	0.3	. .	23.6	34	. .	652	. .	680	. .	30.8	56 45 55.6	. .	+ 1 30.8	107 53 47.6	− 3.1
5	79 38	. .	5.8	. .	26.8	31	. .	. .	. .	330	436	30.8	79 42 41.6	. .	+ 5 18.0	130 54 20.8	− 7.2
6	79 6	. .	0.1	. .	23.0	32	. .	545	. .	582	. .	30.8	79 10 28.1	. .	+ 5 24.5	130 22 13.8	− 7.0
7	22 18	. .	2.7	. .	25.2	30	. .	643	. .	685	. .	30.8	22 22 55.1	42.0	+ 24.6	73 29 40.9	+ 2.1
8	55 20	. .	1.7	. .	25.5	29	. .	960	. .	000	. .	30.8	55 25 5.8	. .	+ 1 26.3	106 32 52.3	+ 2.0
9	311 36	. .	1.2	. .	24.8	33	. .	. .	. .	240	310	30.8	311 40 16.5	. .	− 1 6.9	2 45 30.8	− 1.5
10	61 32	9.5	1.0	24.8	24.8	31	. .	400	. .	418	. .	34.0	61 34 14.4	37.4	+ 1 50.6	112 42 26.2	+ 4.3
11	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
12	78 16	10.8	2.6	22.9	24.0	38	. .	660	. .	700	. .	34.0	78 18 55.7	37.0	+ 4 43.6	129 30 0.5	− 0.9
13	359 50	6.9	0.0	23.8	23.1	32	. .	.	. .	. .	604	34.0	359 54 31.6	. .	− 0.1	51 0 52.7	−16.5
14	359 50	6.9	0.0	23.8	23.1	33	. .	337	. .	429	. .	34.0	359 54 19.0	. .	− 0.1	51 0 40.1	+ 2.0
15	79 16	10.0	0.0	21.8	23.5	34	. .	480	. .	644	. .	34.0	79 20 0.0	. .	+ 5 9.9	130 31 31.1	− 0.6
16	232 22	7.8	0.0	23.6	22.9	33	. .	. .	810	770	822	34.0	232 26 13.1	. .	+ 1 18.0	358 38 50.1	− 1.1
17	307 30	7.5	0.5	22.6	24.7	35	. .	240	260	. .	. .	34.0	307 33 49.7	. .	− 1 18.0	358 38 52.9	+ 1.7
18	232 22	8.2	1.7	25.3	24.2	33	850	813	787	. .	. .	34.0	232 26 12.4	36.7	− 1 18.0	358 38 50.8	− 0.4
19	38 46	9.3	2.2	25.3	24.7	32	. .	. .	. .	770	804	34.0	38 50 26.2	. .	+ 48.4	89 57 35.8	+ 3.3
20	79 48	13.4	4.5	23.6	25.3	33	. .	. .	. .	990	038	34.0	79 52 5.7	. .	+ 5 25.5	131 3 52.4	− 0.4
21	70 6	11.6	1.1	23.2	24.6	35	. .	268	. .	. .	. .	34.0	70 9 47.7	. .	+ 2 45.3	121 18 54.2	− 3.2
22	70 6	11.6	1.1	23.2	24.6	36	. .	. .	. .	312	320	34.0	70 9 31.9	. .	+ 2 45.3	121 18 38.4	− 3.2
23	290 40	6.5	2.4	24.5	25.5	28	693	588	724	. .	. .	34.0	290 45 29.5	. .	− 2 38.2	341 49 12.5	+ 1.8
24	49 30	5.7	0.2	22.7	22.8	31	. .	640	. .	650	. .	34.0	49 33 59.9	36.8	+ 1 10.5	100 41 31.6	. .
25	49 30	5.7	0.2	22.7	22.8	37	368	. .	. .	. .	444	34.0	49 33 17.6	. .	+ 1 10.5	100 40 49.3	. .
26	79 42	7.8	1.3	20.7	23.5	33	. .	068	. .	062	. .	34.0	79 46 23.4	. .	+ 5 22.9	130 58 7.5	− 0.5
27	54 20	11.3	3.0	24.9	24.1	36	. .	. .	. .	188	200	34.0	54 21 0.8	. .	+ 1 23.8	105 28 45.8	−18.5
28	54 20	11.3	3.0	24.9	24.1	35	. .	680	. .	724	. .	34.0	54 23 40.7	36.1	+ 1 23.9	105 31 25.8	+ 2.3
29	0 10	10.0	7.0	27.9	26.1	34	. .	646	. .	716	. .	34.8	0 13 55.6	. .	+ 0.2	51 20 17.0	− 1.0
30	5 36	10.5	7.7	27.5	26.0	31	. .	290	. .	292	. .	34.8	5 40 47.3	34.2	+ 6.1	56 47 14.6	− 1.0
31	65 14	11.0	6.2	27.5	26.6	32	. .	. .	. .	120	172	34.8	65 18 34.1	. .	+ 2 10.5	116 27 5.8	− 0.5
32	25 8	10.7	7.2	28.6	26.7	31	. .	520	. .	544	. .	34.8	25 12 43.1	. .	+ 28.4	76 19 32.7	− 0.3
33	331 24	7.5	4.9	25.6	24.9	34	127	. .	. .	. .	167	34.8	331 23 5.8	36.0	− 32.7	22 33 54.3	− 0.3
34	35 56	9.1	5.0	27.4	25.0	39	. .	962	. .	998	. .	34.8	36 1 8.2	. .	+ 43.6	87 8 13.0	− 0.3
35	11 8	11.0	7.8	29.5	26.5	34	. .	870	. .	886	. .	34.8	11 11 51.5	. .	+ 11.9	62 18 24.6	−20.8
36	58 6	13.0	9.2	1.0	28.8	32	. .	910	. .	920	. .	34.8	58 10 19.5	. .	+ 1 36.1	109 18 16.8	. .
37	58 6	13.0	9.2	1.0	28.8	34	458	. .	. .	. .	528	34.8	58 9 54.4	. .	+ 1 36.1	109 17 51.7	. .
38	28 30	11.6	7.2	27.7	27.0	31	. .	310	. .	360	. .	34.8	28 34 46.0	39.0	+ 32.5	79 41 39.7	− 0.5
39	30 16	11.2	7.7	28.7	27.1	30	. .	. .	. .	638	684	34.8	30 20 56.4	. .	+ 34.9	81 27 52.5	− 0.7
40	40 0	12.0	7.6	1.1	27.3	32	. .	412	. .	486	. .	34.8	40 4 27.8	40.5	+ 50.0	91 11 39.0	−14.3
41	51 44	11.5	6.8	29.8	25.7	32	. .	. .	. .	838	808	34.8	51 48 23.3	. .	+ 1 15.5	102 56 0.0	− 1.6
42	358 58	12.9	9.3	1.1	28.6	32	. .	205	. .	213	. .	34.8	359 2 30.7	. .	− 1.0	50 8 50.9	−18.9
43	354 0	10.8	7.1	29.0	26.6	34	. .	530	. .	566	. .	34.8	354 3 57.1	42.0	− 6.2	45 10 12.1	− 1.2
44	9 6	11.9	9.7	1.8	28.5	31	. .	032	. .	104	. .	34.8	9 10 48.1	43.8	+ 9.6	60 17 18.9	− 1.0
45	336 46	9.1	7.6	28.5	26.7	30	835	. .	. .	. .	869	34.8	336 50 53.9	. .	− 25.3	27 56 49.8	− 2.1
46	328 50	11.4	8.7	29.9	28.0	30	454	. .	. .	. .	518	34.8	328 53 43.3	44.6	− 35.6	19 59 28.9	0.0
47	29 30	11.6	7.9	0.4	27.1	37	. .	. .	. .	812	840	34.8	29 35 6.1	. .	+ 33.5	80 42 0.8	− 0.4
48	47 12	19.6	16.2	7.9	4.5	30	365	389	. .	. .	. .	34.8	47 16 51.1	. .	+ 1 3.4	98 24 15.7	. .
49	47 44	19.7	15.7	6.5	2.6	29	. .	. .	. .	193	201	34.8	47 49 11.6	47.2	+ 1 4.7	98 56 37.5	. .
50	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .

No.	Barom.	At. Ther.
	in.	°
8	30.20	45.0
11	30.15	39.0
28	30.12	38.0
31	30.04	35.0
46	30.05	42.0
49	30.02	45.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
24	− 1.4	− 21.1	. .	− 22.5
25	− 1.4	+ 21.2	. .	+ 19.8
36	− 10.2	− 12.6	+ 0.1	− 22.7
37	− 10.2	+ 12.6	. .	+ 2.4
48	− 6.5	+ 16 10.9	. .	+ 16 4.4
49	− 6.5	− 16 10.9	. .	− 16 17.4

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Feb. 26	1	γ Pegasi	S.	. .	. .	. .	. .	. .	. .	7.5	9.0	11.8	6 59.05	+ 0.13	−12.20	−12.27	0 6 46.91	+ 0.02
	2	β Ceti	S.	17.0	19.7	21.3	27.7	29.8	32.0	38.4	40.0	42.9	37 29.87	+ 0.49	−12.23	−12.26	0 37 18.10	+ 0.02
	3	Polaris	S.	. .	. .	38.0	5.7	32.0	57.5	25.5	. .	. .	12 31.74	−24.67	. .	−12.26	1 11 54.81	− 2.76
	4	B A. C. 1149	S.	40.9	43.7	45.3	51.9	54.3	56.4	3.3	4.9	7.6	37 54.26	0.00	. .	−12.01	3 37 42.25	+ 0.22
	5	η Tauri	S.	1.8	4.6	6.3	13.0	15.3	17.5	24.1	25.8	28.7	40 15.23	+ 0.02	−12.08	−12.21	3 40 3.04	− 0.13
	6	B. A. C. 1212	S.	33.3	34.7	38.9	41.0	43.0	45.0	47.0	51.1	52.7	46 42.97	+ 0.3	. .	−12.02	3 46 31.29	− 0.01
	7	B. A. C. 1241	S.	44.7	47.4	48.9	55.0	57.2	59.4	5.5	7.0	9.8	53 57 21	+ 0.15	. .	−12.02	3 53 45.34	+ 0.03
	8	B. A. C. 1265	S.	17.9	19.6	24.2	26.6	28.9	31.3	33.6	38.2	39.9	59 28.91	− 0 05	. .	−12.02	3 59 16.8	+ 0.09
	9	B. A. C. 1296	S.	49.0	51.5	53.0	59.1	1.3	3.4	9.5	11.0	13.6	7 1.27	+ 0.20	. .	−12.03	4 6 49.44	− 0.07
	10	B. A. C. 1302	S.	39.8	42.6	44.0	50.5	52.6	54.6	1.0	2.7	5.3	8 52.57	+ 0.12	. .	−12.03	4 8 40.66	− 0.05
	11	B. A. C. 1321	S.	3.2	5.8	7.5	14.0	16.2	18.4	24.9	26.5	29.3	12 16.20	+ 0.05	. .	−12.03	4 12 4.22	− 0.04
	12	B. A. C. 1356	S.	52.7	55.3	56.9	3.4	5.6	7.0	14.0	15.6	18.4	17 5.50	+ 0.09	. .	−12.04	4 16 53.55	− 0.09
	13	ε Tauri	S.	18.3	20.9	22.6	29.0	31.2	33.4	39.8	41.3	44.2	21 31.19	+ 0.07	−12.02	−12.20	4 21 19.06	− 0.19
	14	α Tauri	S.	44.3	47.0	48.5	54.9	57.0	59.2	5.7	7.2	9.8	28 57.07	+ 0.10	−12.05	−12.20	4 28 44.97	− 0.17
	15	B. A. C. 1434	S.	9.9	12.5	14.0	20.3	22.5	24.6	30.8	32.3	34.9	31 22.42	+ 0.15	. .	−12.06	4 31 10.51	− 0.20
	16	B. A. C. 1460	S.	30.0	32.5	34.0	40.2	42.3	44.4	50.6	52.2	54.8	37 42.33	+ 0.16	. .	−12.06	4 37 30.43	− 0.24
	17	B. A. C. 1483	S.	37.9	41.2	43.0	51.2	53.9	56.5	4.4	6.3	9.8	41 53.80	+ 0.78	. .	−12.07	4 41 42.51	− 0.42
	18	ι Aurigæ	S.	49.2	52.2	53.9	1.4	3.8	6.2	13.6	15.3	18.3	49 3.77	− 0.11	−12.11	−12.19	4 48 51.47	− 0.08
	19	Lalande 9335	S.	51.4	54.1	55.6	1.9	4.0	6.1	12.5	14.0	16.6	52 4.02	+ 0.12	. .	−12.07	4 51 52.07	− 0.32
	20	B. A. C. 1537	S.	53.7	56.4	57.8	. .	. .	. .	14.7	16.2	18.9	52 6.28	+ 0.12	. .	−12.07	4 51 54.33	− 0.32
	21	B. A. C. 1551	S.	. .	. .	45.5	47.7	49.9	52.1	54.3	. .	. .	55 49.90	+ 0.04	. .	−12.08	4 55 37.86	− 0.34
	22	B. A. C. 1573	S.	51.6	54.7	56.6	4.2	6.5	9.2	16.8	18.6	21.7	0 6.66	+ 0.71	. .	−12.08	4 59 55.29	− 0.48
	23	B. A. C. 1599	S.	44.5	47.7	49.6	57.0	59.6	2.3	9.7	11.6	14.8	3 59.64	+ 0.72	. .	−12.08	5 3 48.28	− 0.50
	24	B. A. C. 1627	S.	56.5	59.7	1.3	8.7	11.0	13.5	20.9	22.7	25.7	10 11.11	− 0.11	. .	−12.09	5 9 58.91	− 0.46
	25	B. A. C. 1663	S.	6.9	10.0	12.0	19.7	22.3	24.6	32.6	34.5	37.7	16 22.26	− 0.17	. .	−12.09	5 16 10.00	− 0.53
	26	B. A. C. 1907	S.	51.4	54.0	55.5	1.7	3.8	5.9	12.2	13.8	16.5	52 3.87	+ 0.14	. .	−12.14	5 51 51.87	− 0.69
	27	B. A. C. 1938	S.	30.8	33.5	35.1	41.9	44.0	46.3	53.0	54.7	57.4	56 44.08	+ 0.02	. .	−12.14	5 56 31.96	− 0.76
	28	B. A. C. 1976	S.	. .	. .	40.9	43.2	45.8	48.3	50.8	. .	. .	2 45.80	+ 0.69	. .	−12.14	6 2 34.35	− 0.77
	29	B. A. C. 1982	S.	. .	. .	21.7	24.0	26.8	29.3	31.8	. .	. .	3 26.72	+ 0.74	. .	−12.14	6 3 15.32	− 0.78
	30	B. A. C. 2012	S.	44.0	46.5	48.0	54.4	56.5	58.6	4.9	6.5	9.0	8 56.49	+ 0.14	. .	−12.14	6 8 44.49	− 0.79
	31	δ Ursæ Minoris, S.P.	S.	13.7	46 5	39.0	4.1	. .	. .	. .	. .	. .	12 29.54	+10.27	. .	−12.17	18 12 27.64	− 0.31
	32	B. A. C. 2064	S.	59.5	1.3	5.6	7.8	10.0	12.3	14.6	19.0	20.6	18 10.08	+ 0.02	. .	−12.15	6 17 57.95	− 0.90
	33	B. A. C. 2109	S.	30.0	33.0	34.9	42.0	44.5	47.0	54.3	56.0	59.0	23 44.52	+ 0.67	. .	−12.16	6 23 33.03	− 0.84
	34	B. A. C. 2138	S.	. .	. .	6.3	8.9	11.6	14.3	17.0	. .	. .	27 11.62	+ 0.80	. .	−12.16	6 27 0.26	− 0.91
	35	γ Geminorum	S.	29.6	32.3	33.9	40.2	42.4	44.6	50.8	52.4	55.0	30 42.36	+ 0.10	−12.00	−12.16	6 30 30.30	−- 0.10
	36	B. A. C. 2190	S.	. .	. .	31.3	33.9	36.6	39.0	41.9	. .	. .	34 36.52	+ 0.75	. .	−12.17	6 34 25.10	− 0.92
	37	α Canis Majoris	S.	40.8	42.3	46.6	48.8	50.9	53.0	55.1	59.4	0.9	40 50.87	+ 0.46	−12.20	−12.16	6 39 39.17	+ 0.02
	38	51 Cephei	S.	. .	. .	. .	. .	. .	22.0	. .	47.8	19.4	41 57.64	−12.07	. .	−12.16	6 41 33.41	+ 0.26
	39	ε Canis Majoris	S.	41.5	44.3	46.0	53.0	55.4	57.7	4.7	6.3	9.4	53 55.37	+ 0.61	−12.20	−12.16	6 53 43.82	− 0.01
	40	α Coronæ Borealis	S.	22.8	25.7	27.4	34.2	36.4	38.7	45.7	47.4	50.3	29 36.51	− 0.05	−12.00	−12.03	15 29 24.43	− 0.03
	41	Moon II, S.	S.	. .	. .	0.5	2.7	5.0	7.2	9.7	. .	. .	40 5.02	+ 0.53	. .	−12.12	15 39 53.43	−66.62
	42	ε Serpentis	S.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	. .
	43	δ Scorpii	S.	55.3	58.0	59.8	6.5	8.7	10.8	17.5	19.0	21.8	53 8.60	+ 0.51	−12.13	−12.03	15 52 57.08	+ 0.11
	44	β¹ Scorpii	S.	9.4	12.0	13.6	. .	. .	. .	30.9	32.6	35.3	58 22.30	+ 0.47	−12.2	−12 03	15 58 10.74	+ 0.24
	45	β² Scorpii	S.	9.8	12.4	14.0	20.6	22.7	24.9	31.4	33.0	35.9	58 22.74	+ 0.47	. .	−12.12	15 58 11.09	− 0.29
	46	δ Ophiuchi (R.)	S.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	. .
	47	α Cygni	Sk.	3.4	6.9	9.0	17.8	20.6	23.6	32.2	34.4	37.8	37 20.63	. .	. .	. .	. . . .	. .
27	48	B. A. C. 1057	Sk.	4.3	6.9	8.5	14.6	16.6	18.7	25.0	26.5	29.0	18 16.68	+ 0.06	. .	−11.71	3 18 5.03	+ 0.24
	49	B. A. C. 1147	Sk.	25.6	28.4	30.0	36.6	38.8	41.1	48.0	49.6	52.4	37 38.94	− 0.09	. .	−11.70	3 37 27.15	+ 0.23
	50	η Tauri	Sk.	1.6	4.3	6.0	12.7	15.0	17.2	23.5	25.6	28.4	40 14.92	− 0.09	−11.67	−11.69	3 40 3.14	− 0.02

6. Wire A used.
21. Bisections at wires V and VI.
34. Bisection at wire III.
46. Bisections at wires III-VII.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	.	. . . .	50.0	. .	. . . .	. .
2	57 28	10 10.7	8.1	1.0	26.5	31	. .	700	. .	800	. .	34.8	57 32 38.8	50.8	+ 1 31.3	108 40 31.3	+ 1.0
3	310 12	9.6	7.3	28.2	26.2	34	523	. .	. .	. .	600	34.8	310 15 57.5	51.3	− 1 8.5	1 21 10.2	+ 0.5
4	14 22	18.3	8.7	6.3	0.2	31	. .	895	. .	915	. .	36.6	14 26 34.1	49.7	+ 15.0	65 33 10.3	+ 8.9
5	15 6	17.5	12.0	3.5	28.7	33	. .	183	. .	237	. .	36.6	15 10 14.6	. .	+ 15.8	66 16 51.6	+ 1.3
6	44 32	19.9	14.1	5.0	29.8	40	. .	394	. .	550	. .	36.6	44 36 54 3	. .	+ 57.4	95 44 12.9	− 1.1
7	26 40	16.9	12.0	4.1	28.8	30	. .	353	. .	375	. .	36.6	26 44 58.0	48.7	+ 29.4	77 51 48.6	+ 4.9
8	10 10	17.8	15.2	6.6	0.0	35	. .	553	. .	573	. .	36.6	10 13 36.6	. .	+ 10.5	61 20 8.3	+10.9
9	31 26	12.8	8.9	0.7	25.7	37	. .	020	. .	086	. .	36.6	31 29 19.0	. .	+ 35.8	82 36 16.0	+ 3.5
10	23 44	13.7	10.4	1.8	26.3	34	. .	443	. .	501	. .	36.6	23 47 57.6	. .	+ 25.8	74 54 44.6	+ 6.2
11	17 58	18.5	14.9	6.1	29.6	30	. .	324	. .	372	. .	36.6	18 2 56.5	46.4	+ 19.1	69 9 36.8	+ 8.3
12	21 40	17.8	12.7	4.7	28.5	34	. .	048	. .	114	. .	36.6	21 44 0.7	. .	+ 23.4	72 50 45.3	+ 7.1
13	19 56	15.4	11.2	3.4	27.5	37	. .	697	. .	727	. .	36.6	19 59 6.6	. .	+ 21.3	71 5 49.1	+ 2.5
14	22 34	12.8	10.1	2.2	26.2	35	. .	166	. .	174	. .	36.6	22 37 47.1	46.0	+ 24.4	73 44 32.7	+ 2.5
15	26 34	15.0	10.7	2.5	27.3	35	. .	856	. .	912	. .	36.6	26 37 35.1	. .	+ 29.4	77 44 25.7	+ 5.5
16	27 54	10.8	6.3	27.8	24.3	32	. .	967	. .	047	. .	36.6	27 58 23.2	. .	+ 31.2	79 5 15.6	+ 5.1
17	78 20	17.0	10.8	0.8	27.8	33	. .	474	. .	554	. .	36.6	78 24 10.8	. .	+ 4 39.4	129 35 11.4	− 9.0
18	5 52	14.0	8.6	0.1	25.3	36	. .	800	. .	858	. .	36.6	5 55 22.6	43.2	+ 6.1	57 1 49.9	+ 0.9
19	24 28	18.8	15.4	6.3	0.7	34	948	. .	. .	. .	014	36.6	24 31 45.1	. .	+ 26.9	75 38 33.2	+ 6.4
20	24 28	18.8	15.4	6.3	0.7	33	. .	520	. .	550	. .	36.6	24 32 7.2	. .	+ 26.9	75 38 55.3	+ 6.4
21	17 24	11.2	8.4	0.3	24.6	31	. .	. .	. .	920	920	36.6	17 28 38.8	. .	+ 18.6	68 35 18.6	+ 8.9
22	74 26	20.2	13.5	4.2	29.6	35	. .	486	. .	476	. .	36.6	74 29 38.0	. .	+ 3 29.7	125 39 28.9	− 8.0
23	74 38	16.1	11.4	1.9	27.5	29	. .	840	. .	900	. .	36.6	74 43 6.5	. .	+ 3 32.9	125 53 0.6	− 8.0
24	5 36	16.7	14.0	4.5	29.5	37	. .	936	. .	954	. .	36.6	5 39 0.4	42.2	+ 5.8	56 45 27.4	+13.0
25	1 34	11.9	11.4	3.0	27.0	36	. .	602	. .	638	. .	36.6	1 37 25.6	. .	+ 1.7	52 43 48.5	+14.3
26	26 2	15.8	12.0	3.5	28.0	36	. .	340	. .	410	. .	36.6	26 5 26.6	39.2	+ 29.1	77 12 16.9	+ 5.6
27	15 34	12.2	10.3	2.1	27.0	37	. .	623	. .	633	. .	36.6	15 37 10.4	. .	+ 16.6	66 43 48.2	+ 9.0
28	73 4	12.7	7.3	29.3	25.7	32	730	736	. .	. .	. .	36.6	73 8 25.2	. .	+ 3 14.0	124 18 0.4	− 7.0
29	76 0	16.1	9.4	0.0	26.5	34	. .	. .	. .	008	014	36.6	76 4 4.5	. .	+ 3 55.6	127 14 21.3	− 7.5
30	26 14	16.5	13.7	5.2	29.1	34	. .	918	. .	946	. .	36.6	26 17 47.4	. .	+ 29.4	77 24 38.0	+ 5.3
31	305 28	15.6	13.6	4.1	0.0	37	762	772	. .	. .	. .	36.6	305 31 4.1	. .	− 1 23.2	356 36 2.1	+ 0.9
32	15 26	12.1	10.6	2.7	26.5	35	. .	. .	. .	847	825	36.6	15 29 37.2	. .	+ 16.5	66 36 14.9	+ 8.6
33	71 18	14.9	11.2	3.2	28.2	37	. .	926	. .	990	. .	36.6	71 21 2.6	38.1	+ 2 54.9	122 30 18.7	− 6.4
34	79 34	10.5	7.0	26.8	24.3	33	307	. .	. .	. .	. .	36.6	79 38 18.5	. .	+ 5 15.3	130 49 55.0	− 7.6
35	22 18	13.5	10.3	2.4	26.6	30	. .	672	. .	724	. .	36.6	22 22 55.2	. .	+ 24.6	73 29 41.0	+ 2.2
36	76 38	14.3	11.9	2.3	28.1	31	113	217	. .	. .	. .	36.6	76 42 46.3	. .	+ 4 6.5	127 53 14.0	− 7.1
37	55 20	12.2	9.0	1.2	26.1	30	. .	042	. .	062	. .	36.6	55 25 6.0	. .	+ 1 26.1	106 32 53.3	+ 2.5
38	311 36	13.5	10.9	2.9	28.3	33	. .	. .	060	114	072	36.6	311 40 18.0	39.0	− 1 6.7	2 45 32.5	+ 0.9
39	67 36	11.5	7.7	0.0	25.8	36	. .	096	. .	170	. .	36.6	67 39 33.7	. .	+ 2 23.5	118 48 18.4	+ 1.3
40	11 42	10.5	6.8	29.1	25.5	35	. .	893	. .	907	. .	36.6	11 45 38.4	. .	+ 12.5	62 52 12.1	+ 1.7
41	62 46	10.3	5.8	28.7	25.1	37	700	622	448	350	193	36.6	62 49 14.6	31.9	+ 1 56.3	113 57 32.1	. .
42	33 58	13.7	8.4	1.4	27.8	34	. .	592	. .	544	. .	36.6	34 1 56.3	. .	+ 40.5	85 8 58.0	+ 1.0
43	61 4	12.7	7.7	28.6	26.6	35	. .	038	. .	014	. .	36.6	61 7 50.6	. .	+ 1 48.5	112 16 0.3	+ 3.3
44	58 16	13.9	9.6	2.1	27.9	34	702	. .	. .	. .	730	36.6	58 19 53.2	. .	+ 1 37.0	109 27 51.4	+ 1.2
45	58 16	13.9	9.6	2.1	27.9	35	. .	505	. .	591	. .	36.6	58 19 40.6	. .	+ 1 37.0	109 27 38.8	− 9.3
46	137 42	11.7	9.3	2.0	27.0	39	202	143	250	204	286	36.6	137 44 45.4	31.2	− 54.8	93 22 30.6	+ 2.0
47	354 0	17.6	15.5	7.2	2.2	33	. .	950	. .	010	. .	36.5	354 4 0.2	43.3	− 6.1	45 10 15.3	+ 1.7
48	30 14	21.0	18.0	10.2	3.4	34	. .	504	. .	518	. .	36.4	30 17 49.2	37.5	+ 34.7	81 24 45.1	+ 2.9
49	15 6	18.3	13.8	6.2	29.7	33	. .	565	. .	590	. .	36.4	15 10 7.2	. .	+ 16.2	66 16 44.6	+ 8.6
50	15 6	18.3	13.8	6.2	29.7	33	132	108	. .	. .	. .	36.4	15 10 14.0	. .	+ 16.2	66 16 51.4	+ 1.0

No.	Barom.	At. Ther.
	in.	°
8	29.94	49.0
26	29.94	44.0
38	29.93	43.0
43	29.75	37.0
46	29.74	36.0
47	29.66	41.2
48	29.79	40.8

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
41	−48 9.0	− 14 49.2	. .	−1 2 58.2

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscel.an's Corrections.
				I.	II.	III.	IV.	V.	VI.	VII	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Feb. 27	1	ζ Persei	Sk	14.0	17.0	18.8	25.9	28.2	30.7	38.0	39.6	42.6	46 28.31	− 0.18	−11.71	−11.69	3 46 16.44	+ 0.01
	2	B. A. C. 1241	Sk.	44.5	47.0	48.6	54.9	57.0	59.0	5.3	6.9	9.6	53 56.98	+ 0.03	. .	−11.69	3 53 45.32	+ 0.05
	3	B. A. C. 1265	Sk	14.7	17.6	19.4	26.3	28.6	30.9	37.9	39.7	42.6	59 28.63	− 0.14	. .	−11.68	3 59 16.81	+ 0.11
	4	B. A. C. 1296	Sk.	48.8	51.2	52.7	59.0	1.0	3.0	9.2	10.8	13.4	7 1.01	+ 0.07	. .	−11.68	4 6 49.40	− 0.05
	5	B. A. C. 1321	Sk	. .	. .	13.7	15.9	18.0	20.2	24.6	26.2	29.0	12 15.85	− 0.06	. .	−11.67	4 12 4.12	− 0.03
	6	B. A. C. 1356	S	52.5	55.0	56.6	3.2	5.3	7.3	13.9	15.4	18.0	17 5.24	− 0.02	. .	−11.67	4 16 53.55	− 0.08
	7	Anonymous	Sk.	36.8	39.5	41.0	47.3	49.4	51.6	58.0	59.5	2.2	23 49.48	+ 0.05	. .	−11.67	4 23 37.80	− 0.14
	8	B. A. C. 1434	Sk.	9.5	12.0	13.7	20.0	22.1	24.3	30.5	32.0	34.7	31 22.09	+ 0.03	. .	−11.67	4 31 10.45	− 0.18
	9	B. A. C. 1460	Sk.	29.6	32.1	33.8	40.0	42.0	44.0	50.3	51.9	54.4	37 42.01	+ 0.04	. .	−11.66	4 37 30.39	− 0.22
	10	B. A. C. 1488	Sk.	54.5	57.2	59.0	6.1	8.6	11.0	18.0	19.8	22.7	43 8.54	+ 0.44	. .	−11.66	4 42 57.32	− 0.36
	11	B. A. C. 1528	Sk.	29.0	31.8	33.5	37.9	40.0	42.5	44.7	47.0	. .	50 42.47	− 0.10	. .	−11.66	4 50 30.71	− 0.29
	12	Lalande 9335	Sk.	51.0	53.6	55.0	. .	. .	. .	12.1	13.6	16.3	52 3.60	+ 0.01	. .	−11.66	4 51 51.95	− 0.31
	13	B. A. C. 1537	Sk.	. .	. .	1.6	3.7	5.9	7.9	10.0	. .	. .	52 5.82	+ 0.01	. .	−11.66	4 51 54.17	− 0.31
	14	B. A. C. 1794	Sk.	27.0	29.4	30.9	37.1	39.1	41.1	47.2	48.8	51.3	34 39.10	+ 0.10	. .	−11.62	5 34 27.64	− 0.56
	15	B. A. C. 1825	Sk.	18.4	21.7	23.7	31.7	34.4	36.8	44.9	46.9	50.2	39 34.30	+ 0.55	. .	−11.62	5 39 23.23	− 0.67
	16	B. A. C. 1859	Sk.	. .	. .	. .	57.8	0.1	2.5	7.4	9.2	12.4	43 57.66	+ 0.47	. .	−11.62	5 43 46.51	− 0.66
	17	B. A. C. 1900	Sk.	9.0	12.3	14.3	21.8	24.5	27.0	34.8	36.5	39.8	51 24.44	− 0.26	. .	−11.61	5 51 12.57	− 0.81
	18	B. A. C. 1938	Sk.	33.2	34.8	39.2	41.4	43.7	45.9	48.0	52.5	54.1	56 43.64	− 0.08	. .	−11.61	5 56 31.95	− 0.75
	19	B. A. C. 1996	Sk.	0.9	3.9	5.8	13.1	15.7	18.4	25.8	27.6	30.8	6 15.78	+ 0.49	. .	−11.60	6 6 4.67	− 0.76
	20	B. A. C. 2012	Sk.	43.5	46.0	47.7	53.8	56.0	58.1	4.3	5.9	8.5	8 55.98	+ 0.02	. .	−11.60	6 8 44.40	− 0.77
	21	δ Ursæ Minoris, S. P.	Sk.	58.0	14.0	48.0	. .	. .	. .	. .	. .	. .	12 30.60	+ 9.16	. .	−11.66	18 12 28.10	− 0.16
	22	B. A. C. 2098	Sk.	42.0	45.5	47.5	55.5	58.3	1.0	9.2	11.0	14.7	21 58.30	+ 0.58	. .	−11.59	6 21 47.29	− 0.87
	23	γ Geminorum	Sk.	29.2	31.9	33.5	39.8	42.0	44.1	50.4	51.9	54.7	30 41.94	− 0.02	−11.57	−11.66	6 30 30.26	− 0.12
	24	α Canis Majoris.	Sk.	37.6	40.3	42.0	48.2	50.5	52.6	59.0	0.6	3.3	39 50.46	+ 0.29	−11.69	−11.65	6 39 39.10	− 0.04
	25	51 Cephei	Sk.	. .	. .	. .	. .	54.0	37.5	19.5	. .	. .	41 54.43	−10.94	. .	−11.65	6 41 31.8	− 0.98
	26	ε Canis Majoris.	Sk.	41.0	43.9	45.6	52.6	55.0	57.4	4.2	5.9	9.0	53 54.96	+ 0.42	−11.62	−11.65	6 53 43.73	− 0.08
	27	B. A. C. 2313	Sk.	. .	. .	. .	. .	. .	4.0	8.4	10.0	12.8	57 59.51	− 0.08	. .	−11.57	6 57 47.86	− 1.13
	28	δ Canis Majoris.	Sk.	17.1	20.0	21.7	28.3	30.7	32.9	39.8	41.5	44.3	3 30.70	+ 0.39	−11.58	−11.65	7 3 19.44	− 0.12
	29	B. A. C. 2364	Sk.	2.6	5.4	7.0	13.8	16.0	18.2	25.0	26.8	29.5	7 16.03	− 0.10	. .	−11.56	7 7 4.37	− 1.21
	30	δ Geminorum	Sk.	39.0	41.7	43.3	49.9	52.2	54.4	0.9	2.5	5.4	12 52.14	− 0.07	−11.49	−11.65	7 12 40.42	− 0.22
	31	δ Scorpii	Sk.	55.0	57.8	59.3	6.0	8.2	10.4	17.0	18.7	21.5	53 8.21	+ 0.30	−11.49	−11.55	15 52 56.96	− 0.05
	32	β^1 Scorpii	Sk.	9.0	11.6	13.3	19.7	21.8	24.0	30.6	32.1	35.0	58 21.90	+ 0.28	−11.61	−11.55	15 58 10.63	+ 0.09
	33	δ Ophiuchi	Sk.	47.3	49.9	51.3	57.6	59.6	1.6	7.8	9.3	11.9	7 59.59	+ 0.13	−11.62	−11.54	16 7 48.18	+ 0.10
	34	Moon II, S.	Sk.	10.4	13.3	15.0	22.1	24.6	26.8	33.9	35.5	38.5	32 24.46	+ 0.35	. .	−11.60	16 32 13.21	−68.76
	35	B. A. C. 5604	Sk.	. .	. .	. .	. .	48.8	51.0	55.9	57.7	0.7	35 46.29	− 0.23	. .	−11.60	16 36 34.40	− 0.25
	36	μ Herculis	Sk	31.7	34.6	36.3	43.3	45.6	47.8	54.6	56.4	59.5	41 45.53	− 0.18	−11.58	−11.52	17 41 33.83	+ 0.06
	37	B. A. C. 6082	Sk.	54.2	57.2	59.1	6.9	9.5	12.0	19.7	21.7	25.0	52 9.48	− 0.31	. .	−11.62	17 51 57.55	+ 0.39
	38	γ^2 Sagittarii	Sk.	43.5	46.5	48.3	55.3	57.8	0.1	7.2	9.0	12.0	57 57.74	+ 0.39	−11.68	−11.52	17 57 46.61	+ 0.17
	39	δ Ursæ Minoris.	Sk.	. .	. .	40.5	13.5	49.0	23.0	58.0	. .	. .	12 48.80	− 9.52	. .	−11.52	18 12 27.76	− 0.65
28	40	B. A. C. 1100	E.	. .	. .	9.8	11.7	13.9	15.9	18.0	. .	. .	27 13.86	+ 0.19	. .	−11.72	3 27 2.43	+ 0.10
	41	δ Persei	E.	55.5	59.1	1.4	10.5	13.5	16.5	25.5	27.7	31.7	34 13.49	− 0.31	. .	−11.65	3 34 1.50	+ 0.30
	42	η Tauri	E.	1.6	4.4	6.0	12.7	14.8	17.0	23.8	25.5	28.4	40 14.91	− 0.06	−11.71	−11.65	3 40 3.20	+ 0.06
	43	ζ Persei	E.	13.8	16.8	18.7	25.8	28.3	30.8	37.8	39.6	42.9	46 28.28	− 0.14	−11.74	−11.65	3 46 16.49	+ 0.08
	44	γ^1 Eridani	E.	10.7	13.4	15.0	21.2	23.3	25.5	31.8	33.3	36.0	52 23.36	+ 0.22	−11.64	−11.65	3 52 11.93	+ 0.03
	45	B. A. C. 1241	E.	44.5	47.0	48.6	54.9	57.0	59.1	5.4	6.9	9.4	53 56.98	+ 0.03	. .	−11.70	3 53 45.31	+ 0.06
	46	B. A. C. 1265	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	47	B. A. C. 1296	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	B. A. C. 1321	E.	2.8	5.5	7.0	13.6	15.8	18.0	24.6	26.2	29.0	12 15.83	− 0.04	. .	−11.67	4 12 4.12	− 0.01
	49	B. A. C. 1356	E.	52.4	55.0	56.6	3.0	5.2	7.4	13.8	15.4	18.0	17 5.20	0.00	. .	−11.67	4 16 53.53	− 0.06
	50	B. A. C. 1370	E.	. .	. .	40.0	42.2	44.4	46.6	48.7	. .	. .	19 44.38	+ 0.02	. .	−11.67	4 19 32.73	− 0.09

21. Bisections at wires B_1, B_2, and B_3.
34. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	7 18	10 20.2	18.0	8.8	7.8	30	. .	998	. .	028	. .	36.4	7 22 42.3	. .	+ 7.7	58 29 11.2	+ 0.6
2	26 40	20.8	17.1	9.6	3.7	30	. .	023	. .	061	. .	36.4	26 44 58.0	. .	+ 30.1	77 51 49.3	+ 4.9
3	10 10	20.7	18.2	8.5	4.5	35	. .	. .	. .	232	266	36.4	10 13 38.6	. .	+ 11.1	61 20 10.9	+10.8
4	31 26	14.8	10.5	2.8	27.3	36	886	910	. .	. .	. .	36.4	31 29 19.1	. .	+ 36.6	82 36 16.9	+ 3.5
5	17 58	14.9	12.4	3.3	27.6	30	. .	. .	. .	612	612	36.4	18 2 55.4	. .	+ 19.5	69 9 36.1	+ 8.3
6	21 40	20.3	17.7	10.0	3.3	33	. .	800	. .	845	. .	36.4	21 44 0.1	. .	+ 23.9	72 50 45.2	+ 7.0
7	29 16	15.4	14.0	5.2	28.0	38	550	560	. .	. .	. .	36.4	29 18 51.9	. .	+ 33.6	80 25 46.7	+ 4.4
8	26 34	19.9	17.9	10.0	2.5	35	. .	. .	. .	455	523	36.4	26 37 35.1	. .	+ 30.1	77 44 26.4	+ 5.5
9	27 54	16.8	13.7	5.1	29.8	32	614	620	. .	. .	. .	36.4	27 58 22.2	. .	+ 31.9	79 5 15.3	+ 5.0
10	69 2	18.0	12.5	5.5	29.3	34	200	230	. .	. .	. .	36.4	69 5 57.3	. .	+ 2 36.2	120 14 54.7	+ 7.1
11	13 58	16.5	12.7	4.3	28.5	34	475	362	. .	. .	. .	36.4	14 1 55.6	32.0	+ 15.0	65 8 31.8	+10.1
12	24 28	14.4	11.2	2.9	28.1	35	. .	. .	. .	190	. .	36.4	24 31 45.6	. .	+ 27.5	75 38 34.3	+ 6.3
13	24 28	14.4	11.2	2.9	28.1	33	. .	. .	. .	. .	810	36.4	24 32 6.9	. .	+ 27.5	75 38 55.6	+ 6.3
14	40 50	18.8	14.1	6.5	6.2	36	. .	265	. .	250	. .	36.4	40 53 24.1	. .	+ 52.2	92 0 37.5	+ 1.9
15	78 12	19.1	14.6	4.6	2.1	30	. .	. .	. .	430	530	36.4	78 16 53.8	. .	+ 4 43.7	129 27 58.7	− 8.3
16	72 14	16.7	12.1	3.5	0.5	30	. .	. .	. .	082	100	36.4	72 19 1.7	. .	+ 3 7.3	123 28 30.2	− 7.2
17	1 38	15.8	13.6	4.3	28.6	36	680	745	. .	. .	. .	36.4	1 41 20.6	. .	+ 1.8	52 47 43.6	+13.8
18	15 34	17.9	14.5	6.4	1.0	37	. .	264	. .	296	. .	36.4	15 37 10.0	. .	+ 16.9	66 43 48.1	+ 9.0
19	73 34	16.5	11.6	3.6	29.0	34	438	452	. .	. .	. .	36.4	73 37 54.9	. .	+ 3 23.2	124 47 39.3	− 7.1
20	26 14	17.1	12.8	5.6	29.5	34	. .	894	. .	. .	990	36.4	26 17 47.1	. .	+ 29.9	77 24 38.2	+ 5.3
21	305 28	15.0	12.0	5.1	0.2	37	610	728	728	. .	. .	36.4	305 31 4.5	. .	− 1 24.6	356 36 1.1	+ 0.1
22	79 38	16.5	10.9	7.0	26.1	32	. .	. .	. .	118	010	36.4	79 42 32.0	. .	+ 5 22.8	130 54 16.0	− 7.8
23	22 18	17.3	13.5	6.2	0.2	30	. .	. .	. .	550	. .	36.4	22 22 54.0	. .	+ 25.0	73 29 40.2	+ 1.4
24	55 20	15.0	11.0	4.0	28.6	29	958	016	. .	. .	. .	36.4	55 25 3.9	. .	+ 1 27.7	106 32 52.8	+ 1.9
25	311 36	16.0	12.7	4.0	29.7	32	. .	. .	870	846	890	36.4	311 40 19.4	29.3	− 1 8.0	2 45 32.6	+ 1.2
26	67 36	15.7	10.3	3.6	29.0	36	. .	150	. .	178	. .	36.4	67 39 29.6	. .	+ 2 26.6	118 48 17.4	+ 0.1
27	16 0	20.0	16.9	7.2	2.5	34	. .	. .	. .	230	230	36.4	16 3 55.5	. .	+ 17.5	67 10 34.2	+ 7.3
28	65 0	17.9	12.0	5.0	0.0	36	540	685	. .	. .	. .	36.4	65 3 20.8	. .	+ 2 9.9	116 11 51.9	+ 2.6
29	13 44	14.0	12.0	6.5	28.0	37	. .	000	. .	012	. .	36.4	13 47 16.6	. .	+ 14.9	64 53 52.7	+ 7.6
30	16 36	16.5	14.5	7.4	29.7	31	. .	585	. .	583	. .	36.4	16 40 37.7	28.5	+ 18.2	67 47 17.1	+ 2.3
31	61 4	16.5	12.0	5.5	2.0	34	. .	972	. .	019	. .	38.4	61 7 47.7	. .	+ 1 51.9	112 16 0.8	+ 3.7
32	58 16	13.6	8.8	6.0	0.0	34	. .	. .	. .	940	. .	38.4	58 19 50.7	22.6	+ 1 40.2	109 27 52.1	+ 1.8
33	42 10	13.2	8.7	7.6	28.1	29	. .	532	. .	600	. .	38.4	42 15 13.0	. .	+ 56.3	93 22 30.5	+ 1.8
34	65 54	13.5	8.8	6.0	28.6	36	760	. .	710	. .	636	38.4	65 57 23.9	. .	+ 2 18.5	117 6 3.6	. .
35	7 10	18.4	14.5	10.7	2.4	33	. .	. .	. .	541	591	38.4	7 14 7.9	. .	+ 7.9	58 20 37.0	−25.4
36	11 2	15.4	11.6	11.8	29.5	33	. .	590	. .	650	. .	38.4	11 6 8.5	. .	+ 12.3	62 12 42.0	+ 1.2
37	1 34	15.6	12.4	9.8	0.3	34	. .	260	. .	328	. .	38.4	1 37 58.3	. .	+ 1.8	52 44 21.3	−25.9
38	69 12	16.4	12.2	8.4	29.7	32	. .	668	. .	620	. .	38.4	69 16 23.5	. .	+ 2 44.0	120 25 28.7	− 1.7
39	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	18.7	. .	. . . .	. .
40	48 42	16.8	12.7	8.4	1.2	35	. .	960	. .	960	. .	38.5	48 45 32.3	27.5	+ 1 10.2	99 53 3.7	− 2.7
41	351 26	12.8	9.1	4.5	29.5	32	. .	765	. .	800	. .	38.5	351 30 24.7	. .	− 9.2	42 36 36.7	+ 1.1
42	15 6	12.3	9.2	5.2	28.6	33	. .	460	. .	500	. .	38.5	15 10 14.0	. .	+ 16.7	66 16 51.9	+ 1.5
43	7 18	15.4	12.0	8.4	1.3	31	. .	390	. .	400	. .	38.5	7 22 43.0	. .	+ 8.0	58 29 12.2	+ 1.5
44	52 40	17.6	12.8	7.7	1.5	32	810	775	. .	. .	. .	38.5	52 44 20.3	. .	+ 1 21.0	103 52 2.5	+ 4.3
45	26 40	19.1	15.0	13.0	4.2	30	. .	. .	. .	180	275	38.5	26 44 57.5	. .	+ 31.1	77 51 49.8	+ 4.9
46	10 10	19.1	11.0	11.3	4.8	35	. .	. .	. .	450	485	38.5	10 13 38.8	. .	+ 11.1	61 20 11.1	+10.8
47	31 26	10.1	7.0	4.9	26.3	37	. .	. .	. .	350	365	38.5	31 29 16.6	. .	+ 37.8	82 36 15.6	+ 3.4
48	17 58	13.7	10.0	8.2	28.2	30	. .	675	. .	695	. .	38.5	18 2 55.5	. .	+ 20.1	69 9 36.8	+ 8.2
49	21 40	20.4	17.0	15.0	5.0	33	. .	830	. .	840	. .	38.5	21 44 0.4	. .	+ 24.6	72 50 46.2	+ 7.0
50	24 24	15.7	11.8	2.2	1.0	36	. .	. .	. .	740	760	38.5	24 27 22.8	. .	+ 28.1	75 34 12.1	+ 6.1

No.	Barom.	At. Ther.
	in.	°
11	29.84	36.5
25	29.88	33.2
30	29.90	32.2
32	30.10	24.6
39	30.18	22.2
40	30.27	29.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
34	−49 40.4	− 14 53.3	. .	− 1 4 33.7

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Feb. 28	1	B. A. C. 1434	E.	9.6	12.3	13.6	20.0	22.2	24.1	30.3	31.9	34.5	31 22.06	+ 0.04	. .	−11.65	4 31 10.45	− 0.17
	2	B. A. C. 1442	E.	5.0	7.7	9.4	15.7	17.8	19.9	26.0	27.6	30.2	33 17.70	+ 0.04	. .	−11.65	4 33 6.09	− 0.18
	3	9 Camelopardalis	E.	20.5	26.8	30.4	45.5	50.6	55.8	10.8	14.6	21.0	41 50.67	− 0.86	. .	−11.65	4 41 38.16	+ 0.09
	4	B. A. C. 1551	E.	39.0	40.7	45.0	47.2	49.4	51.6	53.8	58.3	0.0	55 49.44	− 0.04	. .	−11.64	4 55 37.76	− 0.31
	5	ε Ursæ Minoris, S. P.	E.	. .	. .	29.0	14.3	58.5	43.9	29.0	. .	. .	58 58.94	+ 3.51	. .	−11.65	16 58 50.80	+ 0.22
	6	B. A. C. 1601	E.	30.0	32.7	34.4	40.7	42.8	44.9	51.4	52.9	55.5	4 42.81	+ 0.01	. .	−11.62	5 4 31.20	− 0.37
	7	β Orionis	E.	31.4	34.0	35.5	41.6	43.7	45.8	52.0	53.5	56.0	8 43.72	+ 0.18	−11.63	−11.65	5 8 32.25	− 0.02
	8	β Tauri	E.	21.6	24.6	26.4	33.3	35.6	37.9	44.9	46.7	49.6	18 35.62	− 0.10	−11.61	−11.65	5 18 23.87	− 0.06
	9	δ Orionis	E.	37.0	39.6	41.0	47.1	49.1	51.3	57.4	58.9	1.5	25 49.21	+ 0.12	−11.57	−11.65	5 25 37.68	+ 0.09
Mar. 4	10	B. A. C. 334	E.	39.5	42.7	44.6	52.0	54.5	57.0	4.5	6.4	9.5	2 54.52	− 0.17	. .	−11.60	1 2 42.75	+ 1.44
	11	Polaris	E.	. .	. .	27.0	52.0	23.0	. .	13.0	. .	. .	12 20.52	−13.55	. .	−11.60	1 11 55.37	+ 1.13
	12	β Arietis	E.	42.0	44.8	46.4	52.8	54.9	57.2	3.7	5.4	8.0	47 55.02	− 0.07	−11.59	−11.59	1 47 43.36	+ 0.02
	13	B. A. C. 1601	E.	. .	. .	38.5	40.6	42.6	44.7	47.0	. .	. .	4 42.68	− 0.04	. .	−11.56	5 4 31.08	− 0.30
	14	β Orionis	E.	31.2	33.8	35.4	41.7	43.7	45.7	52.0	53.5	56.0	8 43.67	+ 0.08	−11.55	−11.53	5 8 32.22	+ 0.02
	15	Weisse (2) 245	E.	26.8	29.9	31.6	. .	. .	. .	51.4	53.2	56.3	10 41.53	− 0.16	. .	−11.56	5 10 29.81	− 0.35
	16	Weisse (2) 247	E.	. .	. .	36.8	39.3	41.8	44.2	46.6	. .	. .	10 41.74	− 0.16	. .	−11.56	5 10 30.02	− 0.35
	17	B. A. C. 1663	E.	. .	. .	19.1	21.5	24.1	26.7	31.9	33.8	37.0	16 21.58	− 0.19	. .	−11.55	5 16 9.84	− 0.40
	18	β Tauri	E.	21.5	24.4	26.2	33.1	35.5	37.8	44.7	46.6	49.5	18 35.48	− 0.12	−11.52	−11.53	5 18 23.83	− 0.03
	19	δ Orionis	E.	36.9	39.6	41.0	47.1	49.1	51.1	57.4	59.0	1.4	25 49.18	+ 0.04	−11.52	−11.53	5 25 37.69	− 0.04
	20	B. A. C. 1773	E.	49.3	52.4	54.2	1.4	4.0	6.4	13.6	15.5	18.6	31 3.93	+ 0.22	. .	−11.54	5 30 52.61	− 0.48
	21	B. A. C. 1798	E.	38.4	41.8	43.9	51.7	54.6	57.3	5.3	7.5	10.9	34 54.60	+ 0.28	. .	−11.54	5 34 43.34	− 0.52
	22	B. A. C. 1825	E.	. .	. .	31.7	34.3	36.9	39.6	45.0	46.9	50.0	39 34.31	+ 0.27	. .	−11.54	5 39 23.04	− 0.54
	23	B. A. C. 1889	E.	13.9	17.3	19.2	26.9	29.4	32.0	39.8	41.7	44.9	48 29.46	+ 0.26	. .	−11.53	5 48 18.19	− 0.58
	24	B. A. C. 1938	E.	30.2	33.0	34.8	41.3	43.6	45.8	52.5	54.0	56.9	56 43.57	− 0.09	. .	−11.53	5 56 31.95	− 0.67
	25	δ Ursæ Minoris, S. P.	E.	. .	. .	45.5	11.5	36.5	1.0	27.5	. .	. .	12 36.40	+ 5.49	. .	−11.52	18 12 30.37	+ 0.58
	26	B. A. C. 2072	E.	. .	. .	38.8	41.0	43.5	46.0	48.3	. .	. .	18 43.52	+ 0.21	. .	−11.52	6 18 32.21	− 0.70
	27	B. A. C. 2109	E.	29.8	32.8	34.6	41.9	44.3	46.8	53.9	55.6	58.8	23 44.28	+ 0.22	. .	−11.52	6 23 32.98	− 0.72
	28	B. A. C. 2134	E.	16.0	18.8	20.5	26.9	29.1	31.4	37.8	39.4	42.0	27 29.10	− 0.07	. .	−11.51	6 27 17.52	− 0.85
	29	B. A. C. 2184	E.	8.9	11.6	13.0	19.6	21.6	23.8	30.2	31.7	34.5	34 21.66	− 0.05	. .	−11.51	6 34 10.10	− 0.87
	30	51 Cephei	E.	. .	. .	24.0	6.0	49.0	31.0	14.0	. .	. .	41 48.80	− 6.62	. .	−11.50	6 41 30.68	− 0.54
	31	B. A. C. 2255	E.	35.5	38.0	39.5	45.9	48.0	50.0	56.4	57.9	0.5	47 47.97	− 0.03	. .	−11.50	6 47 36.44	− 0.92
	32	50 Draconis, S.P.	E.	19.8	9.4	3.3	47.5	39.7	31.4	23.3	. .	. .	50 31.37	+ 1.30	. .	−11.50	18 50 21.17	+ 0.68
	33	Lalande 13681	E.	18.9	21.8	23.9	30.5	32.8	35.0	42.1	43.8	46.8	58 32.84	− 0.12	. .	−11.50	6 58 21.22	− 1.13
	34	Lalande 13700	E.	53.0	55.8	57.5	4.5	6.9	9.3	16.2	17.8	20.9	59 6.88	− 0.12	. .	−11.50	6 58 55.26	− 1.14
	35	Lalande 13724	E.	36.0	37.7	42.4	44.7	47.0	49.4	51.7	56.4	58.0	59 47.03	− 0.12	. .	−11.50	6 59 35.41	− 1.14
	36	Lalande 13757	E.	27.7	30.5	32.5	39.3	41.6	44.0	50.9	52.7	55.6	0 41.64	− 0.12	. .	−11.50	7 0 30.02	− 1.15
	37	Durch. 28°, 1331	E.	50.2	53.0	54.7	1.7	4.0	6.4	13.4	15.1	18.0	4 4.06	− 0.12	. .	−11.49	7 3 52.45	− 1.17
	38	Lalande 13905	E.	33.6	36.5	38.4	45.2	47.5	49.9	56.9	58.6	1.6	4 47.58	− 0.12	. .	−11.49	7 4 35.97	− 1.17
	39	B. A. C. 2422	E.	48.7	52.0	53.9	1.4	4.0	6.5	14.0	15.9	19.2	14 3.96	+ 0.25	. .	−11.49	7 13 52.72	− 0.94
	40	B. A. C. 2425	E.	. .	. .	18.7	21.2	23.8	26.3	28.8	. .	. .	14 23.76	+ 0.25	. .	−11.49	7 14 12.52	− 0.94
	41	B. A. C. 2444	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	42	a² Geminorum	E.	35.8	38.8	40.7	48.0	50.3	52.7	59.9	1.7	4.7	26 50.29	− 0.15	−11.47	−11.50	7 26 38.64	+ 0.21
	43	B. A. C. 2493	E.	14.9	16.7	21.3	23.6	25.9	28.2	30.5	35.0	36.9	28 25.89	− 0.12	. .	−11.48	7 28 14.29	− 1.30
	44	a Canis Minoris	E.	45.7	48.2	49.7	55.9	58.0	0.0	6.2	7.7	10.3	32 57.97	+ 0.01	−11.49	−11.49	7 32 46.49	− 0.16
	45	β Geminorum	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	46	B. A. C. 2580	E.	. .	. .	. .	. .	2.9	5.5	10.6	12.7	16.0	41 0.39	+ 0.26	. .	−11.47	7 40 49.18	− 1.04
	47	B. A. C. 2588	E.	40.0	43.0	45.0	52.9	55.4	57.8	5.6	7.6	10.9	41 55.36	+ 0.26	. .	−11.47	7 41 44.15	− 1.04
	48	B. A. C. 2646	E.	58.5	0.3	5.3	7.8	10.3	12.8	15.3	10.0	12.0	50 10.26	+ 0.23	. .	−11.47	7 49 59.02	− 1.06
7	49	Venus II, N.	E.	42.5	45.2	46.9	53.2	55.4	57.6	4.2	5.7	8.4	14 55.46	+ 0.04	. .	−13.96	20 14 41.54	− 0.73
	50	Venus, S.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .

5. Bisections at wires C_1 and C_6.
32. Bisections on III and IV.
35. Telescope micrometer reading increased one revolution in reduction.
35, 46. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	26 34	10 15.2	11.8	1.8	29.6	35	. .	900	. .	920	. .	38.5	26 37 35.9	. .	+ 31.0	77 44 28.1	+ 5.4
2	26 52	17.0	13.7	4.5	1.8	33	. .	900	. .	910	. .	38.5	26 56 4.4	. .	+ 31.4	78 2 57.0	+ 5.4
3	332 42	14.5	10.2	2.0	1.0	33	. .	500	. .	510	. .	38.5	332 46 13.6	. .	− 31.8	23 52 3.0	+ 3.5
4	17 24	15.5	12.0	4.4	1.0	31	. .	. .	. .	650	685	38.5	17 28 40.2	. .	+ 19.5	68 35 20.9	+ 8.8
5	301 6	12.0	9.2	5.0	28.6	37	. .	220	. .	230	. .	38.5	301 9 16.5	. .	− 1 42.2	352 13 55.5	+ 1.5
6	22 56	15.0	11.3	7.2	1.0	35	. .	080	. .	110	. .	38.5	22 59 46.9	. .	+ 26.3	74 6 34.4	+ 6.9
7	47 10	19.7	15.3	6.3	4.2	36	. .	080	. .	110	. .	38.5	47 13 28.7	. .	+ 1 6.9	98 20 56.8	+ 4.1
8	10 20	19.2	16.7	7.7	5.0	36	. .	615	. .	620	. .	38.5	10 23 20.1	. .	+ 11.4	61 29 52.7	+ 2.7
9	39 12	18.7	13.0	6.5	3.0	32	. .	460	. .	490	. .	38.5	39 16 25.2	24.5	+ 50.7	90 23 37.1	+ 1.8
10	3 52	15.7	12.0	5.0	0.7	33	. .	720	. .	735	. .	37.2	3 56 6.9	. .	+ 4.2	55 2 32.3	+ 3.5
11	310 12	16.0	13.0	5.7	1.5	33	900	. .	860	. .	890	37.2	310 16 3.8	. .	− 1 11.4	1 21 13.6	+ 2.6
12	18 38	11.0	8.5	1.6	28.0	36	. .	. .	. .	370	355	37.2	18 41 30.4	34.8	+ 20.5	69 48 12.1	+ 1.9
13	22 56	17.5	12.0	4.8	0.2	34	. .	. .	. .	960	990	37.2	22 59 47.8	. .	+ 26.1	74 6 35.1	+ 6.8
14	47 10	18.2	12.2	5.2	0.9	36	. .	170	. .	150	. .	37.2	47 13 28.6	. .	+ 1 6.4	98 20 56.2	+ 3.4
15	5 26	19.5	15.7	9.3	4.5	33	. .	. .	. .	455	495	37.2	5 30 7.3	. .	+ 5.9	56 36 34.4	+13.0
16	5 26	19.5	15.7	9.3	4.5	34	. .	. .	. .	540	530	37.2	5 29 51.1	. .	+ 5.9	56 36 18.2	+13.0
17	1 34	15.2	10.4	4.2	28.8	36	. .	. .	. .	470	450	37.2	1 37 26.8	. .	+ 1.7	52 43 49.7	+14.4
18	10 20	20.5	16.8	10.0	4.2	36	. .	560	. .	500	. .	37.2	10 23 19.4	29.0	+ 11.3	61 29 51.9	+ 1.9
19	39 12	17.3	10.7	4.8	0.7	32	. .	430	. .	450	. .	37.2	39 16 26.4	. .	+ 50.3	90 23 37.9	+ 2.5
20	72 8	17.2	10.7	2.6	0.3	34	. .	535	. .	585	. .	37.2	72 11 54.4	. .	+ 3 9.5	123 21 25.1	− 7.6
21	79 30	23.1	16.0	6.7	5.0	29	. .	320	. .	335	. .	37.2	79 35 9.4	. .	+ 5 24.5	130 46 55.1	− 8.8
22	78 12	20.3	14.5	5.0	3.8	30	. .	. .	. .	720	710	37.2	78 16 50.2	. .	+ 4 49.3	129 28 0.7	− 8.6
23	76 24	17.2	11.8	2.2	0.0	29	. .	540	. .	480	. .	37.2	76 29 11.6	. .	+ 4 11.3	127 39 44.1	− 8.2
24	15 34	13.9	9.2	1.8	27.8	37	. .	585	. .	595	. .	37.2	15 37 10.4	. .	+ 17.2	66 43 48.8	+ 9.2
25	305 28	14.7	10.4	2.2	29.8	37	710	. .	730	. .	660	37.2	305 31 7.3	. .	− 1 26.0	356 36 2.5	+ 2.2
26	69 40	19.7	13.5	5.7	2.3	34	. .	. .	. .	155	145	37.2	69 43 58.3	. .	+ 2 45.4	120 53 4.9	− 6.8
27	71 18	15.2	8.8	2.0	28.8	38	. .	400	. .	455	. .	37.2	71 20 56.7	. .	+ 3 0.7	122 30 18.6	− 7.0
28	19 18	16.8	12.5	5.7	0.7	34	. .	780	. .	845	. .	37.2	19 21 49.6	. .	+ 21.6	70 28 32.4	+ 7.2
29	22 18	17.5	12.5	5.5	1.3	32	. .	310	. .	340	. .	37.2	22 22 27.4	. .	+ 25.3	73 29 13.9	+ 6.1
30	311 36	14.0	10.4	2.3	29.8	32	900	. .	910	. .	885	37.2	311 40 21.2	. .	− 1 9.1	2 45 33.3	+ 2.7
31	25 30	19.5	14.0	6.8	2.2	37	. .	765	. .	775	. .	37.2	25 33 2.6	. .	+ 29.4	76 39 53.2	+ 4.8
32	294 8	12.0	7.7	29.8	27.3	31	. .	. .	800	865	. .	37.2	294 12 39.6	. .	− 2 16.2	345 16 44.6	+ 4.5
33	10 26	17.2	14.1	5.0	1.3	31	600	. .	. .	. .	. .	37.2	10 30 38.2	. .	+ 11.4	61 37 10.8	+ 9.2
34	10 26	17.2	14.1	5.0	1.3	37	. .	410	. .	. .	. .	37.2	10 29 9.2	. .	+ 11.4	61 35 41.8	+ 9.1
35	10 26	17.2	14.1	5.0	1.3	38	. .	. .	. .	835	. .	37.2	10 31 20.7	. .	+ 11.5	61 37 53.4	+ 9.1
36	10 26	17.2	14.1	5.0	1.3	37	. .	840	. .	. .	. .	37.2	10 29 2.6	. .	+ 11.4	61 35 35.2	+ 9.1
37	10 26	17.2	14.1	5.0	1.3	35	. .	145	. .	. .	. .	37.2	10 29 43.8	. .	+ 11.4	61 36 16.4	+ 9.0
38	10 26	17.2	14.1	5.0	1.3	40	. .	. .	. .	. .	735	37.2	10 28 19.1	. .	+ 11.4	61 34 51.7	+ 8.9
39	75 16	14.3	10.6	4.8	0.2	32	. .	620	. .	595	. .	37.2	75 20 24.5	. .	+ 3 51.8	126 30 37.5	− 7.3
40	75 16	14.3	10.6	4.8	0.2	30	. .	. .	. .	840	835	37.2	75 20 51.8	. .	+ 3 51.9	126 31 4.9	− 7.3
41	26 54	18.5	11.7	5.5	0.7	32	. .	750	. .	775	. .	37.2	26 58 20.8	. .	+ 31.3	78 5 13.3	+ 3.5
42	6 40	18.8	14.4	7.8	3.8	34	. .	870	. .	950	. .	37.2	6 43 45.9	. .	+ 7.3	57 50 14.4	+ 1.3
43	11 40	23.5	20.2	11.1	8.4	37	. .	. .	. .	485	535	37.2	11 43 1.9	. .	+ 12.8	62 49 35.9	+ 7.6
44	33 16	13.6	8.5	0.0	27.2	32	. .	890	. .	930	. .	37.2	33 20 22.8	. .	+ 40.5	84 27 24.5	+ 2.6
	10 30	16.9	8.0	4.3	1.0	34	. .	. .	. .	965	995	37.2	10 33 48.9	. .	+ 11.5	61 40 21.6	+ 4.1
45	76 24	22.2	17.0	8.0	4.1	37	. .	. .	. .	600	540	37.2	76 29 36.1	. .	+ 4 11.9	127 40 9.2	− 7.2
46	76 24	22.2	17.0	8.0	4.1	36	. .	. .	. .	250	220	37.2	76 27 23.7	. .	+ 4 11.3	127 37 56.2	− 7.1
47	73 18	16.5	10.2	1.7	0.2	35	. .	950	. .	015	. .	37.2	73 21 33.1	27.5	+ 3 23.8	124 31 18.1	− 6.7
48																	
49	56 56	13.4	10.8	3.0	28.8	32	770	. .	. .	. .	860	36.5	57 0 21.6	. .	+ 1 31.9	108 8 14.7	+ 3.8
50	56 56	13.4	10.8	3.0	28.8	31	. .	115	. .	. .	. .	36.5	57 0 47.2	35.0	+ 1 32.0	108 8 40.4	−21.9

No.	Barom.	At. Ther.
	in.	°
9	30.27	27.5
12	30.25	35.0
18	30.30	32.5
48	30.28	31.0
50	29.86	35.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
49	− 9.1	+ 12.9	. .	+ 3.8
50	− 9.1	− 12.9	+ 0.1	− 21.9

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Mar. 7	1	B. A. C. 7022 . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	13.3	17 57.27	− 0.28	. .	−13.96	20 17 43.03	+ 1.32
	2	α Cygni	E.	5.6	9.3	11.4	20.1	23.0	25.9	34.4	36.5	40.0	37 22.91	− 0.32	−13.95	−13.91	20 37 8.68	+ 0.06
	3	ζ Cygni	E.	35.7	38.7	40.5	47.5	49.8	52.2	59.3	1.0	4.0	7 49.86	− 0.20	−13.96	−13.92	21 7 35.74	+ 0.05
	4	β Aquarii . . .	E.	. .	. .	8.0	9.9	11.8	13.9	16.0	. .	. .	25 11.92	− 0.02	−14.04	−13.93	21 24 57.97	+ 0.14
8	5	Sun I, S. . . .	E.	55.5	58.0	59.5	5.6	7.8	10.0	15.9	17.4	20.0	14 7.74	− 0.03	. .	−14.02	23 13 53.69	. .
	6	Sun II, N. . . .	E.	5.3	7.9	9.3	15.5	17.6	19.7	25.8	27.4	30.0	16 17.61	− 0.03	. .	−14.02	23 16 3.56	. .
	7	α Andromedæ . .	E.	24.6	27.4	29.0	6.1	8.5	10.8	17.8	19.5	22.5	2 8.47	− 0.20	−13.96	−14.01	0 1 54.26	− 0.03
	8	B. A. C. 334 . .	E.	42.1	45.1	47.0	54.5	56.9	59.5	7.0	8.8	11.9	2 56.98	− 0.24	. .	−14.06	1 2 42.68	+ 1.46
	9	Polaris . . .	E.	. .	. .	. .	. .	44.0	12.0	5.0	10.0	. .	12 18.42	−11.57	. .	−14.04	1 11 52.81	+ 0.91
	10	B. A. C. 1551 . .	E.	38.8	41.6	43.3	49.8	52.0	54.2	0.8	2.5	5.2	55 52.02	− 0.16	. .	−14.15	4 55 37.71	− 0.17
	11	B. A. C. 1570 . .	E.	26.0	28.8	30.4	37.0	39.1	41.3	47.8	49.4	52.3	0 39.12	− 0.15	. .	−14.15	5 0 24.82	− 0.21
	12	B. A. C. 1601 . .	E.	32.6	35.3	36.9	43.2	45.3	47.5	53.8	55.5	58.0	4 45.34	− 0.13	. .	−14.16	5 4 31.05	− 0.24
	13	β Orionis. . . .	E.	33.9	36.6	38.1	44.3	46.3	48.4	54.6	56.0	58.6	8 46.31	− 0.02	−14.16	−14.16	5 8 32.13	0.00
	14	B. A. C. 1663 . .	E.	8.8	12.0	14.0	21.7	24.3	26.9	34.6	36.5	39.8	16 24.29	− 0.26	. .	−14.16	5 16 9.87	− 0.32
	15	β Tauri	E.	24.2	27.0	28.8	35.8	38.1	40.5	47.5	49.2	52.0	18 38.12	− 0.20	−14.15	−14.16	5 18 23.76	− 0.03
	16	O. Arg. S. 3957 .	E.	4.1	6.8	8.5	14.9	17.1	19.3	25.9	27.4	30.3	21 17.14	+ 0.04	. .	−14.16	5 21 3.02	− 0.34
	17	β Leporis. . . .	E.	54.8	57.6	59.3	5.7	7.9	10.1	16.6	18.3	21.0	23 7.92	+ 0.04	. .	−14.16	5 22 53.80	− 0.35
	18	δ Orionis. . . .	E.	. .	. .	47.8	49.8	51.8	53.9	55.9	. .	. .	25 51.84	− 0.05	−14.16	−14.16	5 25 37.63	− 0.03
	19	B. A. C. 1798 . .	E.	40.9	44.3	46.5	54.5	57.1	59.9	8.0	10.0	13.4	34 57.18	+ 0.16	. .	−14.16	5 34 43.18	− 0.42
	20	B. A. C. 1814 . .	E.	48.9	50.9	55.9	58.3	0.7	3.3	5.8	10.7	12.6	38 0.79	+ 0.12	. .	−14.16	5 37 46.75	− 0.42
	21	B. A. C. 1847 . .	E.	19.6	22.8	24.7	32.4	34.9	37.5	45.0	46.7	50.0	42 34.84	+ 0.13	. .	−14.17	5 42 20.80	− 0.45
	22	B. A. C. 1891 . .	E.	34.5	37.5	39.5	46.8	49.2	51.7	59.0	0.8	4.0	48 49.22	+ 0.12	. .	−14.17	5 48 35.17	− 0.48
	23	B. A. C. 1900 . .	E.	14.6	16.5	21.8	24.2	26.9	29.5	32.0	37.1	39.0	51 26.84	− 0.26	. .	−14.17	5 51 12.41	− 0.63
	24	B. A. C. 1938 . .	E.	32.9	35.6	37.3	44.0	46.3	48.6	55.3	56.8	59.6	56 46.27	− 0.17	. .	−14.17	5 56 31.93	− 0.60
	25	B. A. C. 1998 . .	E.	7.0	10.5	12.6	20.3	22.9	25.6	33.6	35.7	39.0	6 23.02	+ 0.16	. .	−14.17	6 6 9.01	− 0.57
	26	δ Ursæ Minoris, S. P.	E.	8.0	24.5	0.0	15.0	41.5	6.5	2 .5	58.5	15.5	12 41.44	+ 4.67	. .	−14.19	18 12 31.92	+ 0.72
	27	B. A. C. 2089 . .	E.	39.8	43.1	45.2	53.2	55.9	58.6	6.5	8.6	12.0	20 55.88	+ 0.16	. .	−14.18	6 20 41.86	− 0.64
	28	B. A. C. 2184 . .	E.	11.4	14.3	15.8	22.2	24.4	26.5	32.8	34.3	37.0	34 24.30	− 0.13	. .	−14.18	6 34 9.99	− 0.81
	29	51 Cephei	E.	34.0	27.5	59.5	6.5	49.0	32.5	39.0	10.5	3.0	41 49.06	− 5.83	. .	−14.20	6 41 29.03	− 0.58
	30	B. A. C. 2255 . .	E.	38.2	40.8	42.3	48.6	50.8	52.8	59.2	0.8	3.4	47 50.77	− 0.12	. .	−14.18	6 47 36.47	− 0.87
	31	B. A. C. 2288 . .	E.	49.0	52.2	54.0	1.6	4.3	6.8	14.3	16.0	19.2	53 4.16	+ 0.13	. .	−14.19	6 52 50.10	− 0.77
	32	Lalande 13681 .	E.	21.6	24.5	26.3	33.4	35.7	38.0	44.8	46.6	49.7	58 35.62	− 0.20	. .	−14.19	6 58 21.23	− 1.07
	33	Lalande 13700 .	E.	55.7	58.6	0.4	7.4	9.8	12.0	19.1	20.8	23.9	59 9.74	− 0.20	. .	−14.19	6 58 55.35	− 1.08
	34	Lalande 13724 .	E.	. .	. .	45.3	47.6	49.9	52.2	54.6	. .	. .	59 49.92	− 0.20	. .	−14.19	6 59 35.53	− 1.08
	35	Lalande 13757 .	E.	30.6	33.5	35.2	42.1	44.5	46.8	53.7	55.5	58.4	0 44.48	− 0.20	. .	−14.19	7 0 30.09	− 1.09
	36	Durch. 28°, 1331 .	E.	52.9	55.8	57.6	4.5	6.9	9.2	16.1	17.6	20.7	4 6.81	− 0.20	. .	−14.19	7 3 52.42	− 1.11
	37	Lalande 13905 .	E.	36.5	39.3	41.0	48.0	50.3	52.8	59.6	1.4	4.4	4 50.37	− 0.20	. .	−14.19	7 4 35.98	− 1.11
	38	B. A. C. 2444 . .	E.	4.3	7.0	8.6	14.8	16.9	19.0	25.2	26.7	29.5	18 16.79	− 0.11	. .	−14.19	7 18 2.49	− 1.02
	39	B. A. C. 2477^1 . .	E.	. .	. .	13.4	15.7	18.1	20.5	23.0	. .	. .	24 18.14	+ 0.10	. .	−14.20	7 24 4.04	− 0.89
	40	B. A. C. 2477^2 . .	E.	. .	. .	14.0	16.4	18.8	21.1	23.8	. .	. .	24 18.82	+ 0.10	. .	−14.20	7 24 4.72	− 0.89
	41	α^2 Geminorum . .	E.	. .	. .	50.7	53.0	55.4	57.8	2.6	4.4	7.5	26 53.00	− 0.22	−14.17	−14.22	7 26 38.56	+ 0.19
	42	α Canis Minoris .	E.	48.5	51.0	52.5	58.6	0.8	2.9	9.0	10.5	13.0	33 0.76	− 0.08	−14.2	−14.23	7 32 46.45	− 0.15
	43	β Geminorum . .	E.	41.7	44.6	46.4	53.1	55.5	57.9	4.9	6.5	9.6	37 55.58	− 0.20	−14.18	−14.23	7 37 41.15	− 0.08
	44	B. A. C. 2575 . .	E.	10.0	12.0	17.2	19.8	22.2	24.9	27.5	32.6	34.5	40 22.30	+ 0.14	. .	−14.20	7 40 8.24	− 0.96
	45	Lacaille 2956 . .	E.	. .	. .	47.4	49.7	52.5	55.0	57.5	. .	. .	40 52.42	+ 0.14	. .	−14.20	7 40 38.36	− 0.96
	46	B. A. C. 2580 . .	E.	. .	. .	58.0	0.5	3.0	5.9	8.5	. .	. .	41 3.18	+ 0.13	. .	−14.20	7 40 49.12	− 0.96
	47	B. A. C. 2588 . .	E.	. .	. .	55.7	58.1	0.8	3.4	8.5	10.5	13.8	41 58.24	+ 0.14	. .	−14.20	7 41 44.18	− 0.97
	48	B. A. C. 2653 . .	E.	45.0	47.5	49.0	5.1	7.2	9.2	15.4	16.9	19.4	52 7.19	− 0.07	. .	−14.21	7 51 52.91	− 1.11
	49	B. A. C. 2676 . .	E.	30.1	32.8	34.5	41.1	43.4	45.6	52.1	53.8	56.7	56 43.34	− 0.16	. .	−14.21	7 56 28.97	− 1.34
	50	B. A. C. 2690 . .	E.	9.6	12.3	13.9	20.0	22.1	24.2	30.6	32.1	34.8	58 22.18	− 0.12	.	−14.21	7 58 7.85	− 1.23

1. Exact reading of transit 13^s.28.
17, 46. Wire A used.
26, 29. Bisections at sets B and D.
45. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	358 58	10 14.7	11.3	5.0	1.0	31	. .	. .	. .	860	920	36.5	359 2 35.2	. .	− 1.0	50 8 55.4	−20.8
2	354 0	16.8	13.5	5.5	2.0	33	. .	875	. .	925	. .	36.5	354 4 2.6	. .	− 6.2	45 10 17.6	+ 2.2
3	9 6	10.0	7.0	0.9	25.0	31	. .	010	. .	060	. .	36.5	9 10 52.5	. .	+ 9.7	60 17 23.4	+ 1.8
4	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
5	43 56	14.6	10.5	3.0	28.3	36	260	280	. .	. .	. .	36.5	43 59 27.9	. .	+ 57.3	95 6 46.4	. .
6	43 24	14.8	9.3	1.9	26.8	37	. .	. .	. .	550	625	36.5	43 27 10.3	40.0	+ 56.3	94 34 27.8	. .
7	10 26	10.7	7.6	0.2	26.7	36	. .	275	. .	225	. .	36.5	10 29 32.1	. .	+ 11.0	61 36 4.3	+ 2.9
8	3 52	16.0	15.2	7.6	0.9	33	. .	480	. .	. .	. .	36.5	3 56 8.7	. .	+ 4.1	55 2 34.0	+ 2.8
9	310 12	12.9	12.0	4.0	29.2	33	. .	. .	950	. .	. .	36.5	310 16 4.0	. .	− 1 10.1	1 21 15.1	+ 3.1
10	17 24	14.5	10.0	2.0	26.5	31	. .	655	. .	680	. .	36.4	17 28 40.3	. .	+ 18.9	68 35 20.4	+ 8.7
11	18 34	15.0	11.5	4.0	27.7	33	. .	755	. .	780	. .	36.4	18 38 6.7	. .	+ 20.3	69 44 48.2	+ 8.3
12	22 56	15.4	11.5	4.0	28.0	34	. .	905	. .	930	. .	36.4	22 59 48.9	. .	+ 25.5	74 6 35.6	+ 6.8
13	47 10	18.0	13.0	4.5	0.5	35	. .	960	. .	000	. .	36.4	47 13 30.7	. .	+ 1 4.9	98 20 56.8	+ 4.0
14	1 34	14.5	11.0	2.5	27.5	36	485	495	. .	. .	. .	36.4	1 37 25 7	35.5	+ 1.7	52 43 48.6	+14.4
15	10 20	21.0	16.4	7.7	4.3	36	. .	450	. .	490	. .	36.4	10 23 20.1	. .	+ 11.0	61 29 52.3	+ 2.3
16	59 38	8.9	6.4	28.9	24.4	35	. .	970	. .	995	. .	36.4	59 41 37.5	. .	+ 1 42.7	110 49 41.4	− 4.8
17	59 38	8.9	6.4	28.9	24.4	37	. .	850	. .	850	. .	36.4	59 43 41.8	. .	+ 1 42.8	110 51 45.8	− 4.8
18	39 12	16.2	11.4	3.6	29.2	32	. .	. .	. .	400	380	36.4	39 16 27.5	. .	+ 49.2	90 23 37.9	− 2.5
19	79 30	15.8	9.9	0.3	27.2	29	. .	. .	. .	270	330	36.4	79 35 16.2	. .	+ 5 17.8	130 46 55.2	− 9.0
20	73 30	17.2	11.1	2.0	29.0	33	. .	. .	. .	170	200	36.4	73 34 15.2	. .	+ 3 21.8	124 43 58.2	− 7.9
21	75 2	18.2	12.3	3.3	0.4	31	. .	. .	. .	010	060	36.4	75 6 46.9	. .	+ 3 43.5	126 10 51.6	− 8.2
22	72 36	16.0	8.7	2.0	28.3	32	. .	540	. .	570	. .	36.4	72 40 25.8	. .	+ 3 11.3	123 49 58.3	− 7.7
23	1 38	14.5	9.4	3.1	28.2	36	. .	920	. .	925	. .	36.5	1 41 19.3	. .	+ 1.8	52 47 42.3	+14.0
24	15 34	13.0	9.4	2.6	27.3	37	. .	510	. .	500	. .	36.4	15 37 11.0	. .	+ 16.9	66 43 49.1	+ 9.1
25	79 4	19.2	14.0	4.4	1.0	31	. .	530	. .	560	. .	36.4	79 8 37.8	. .	+ 5 6.4	130 20 5.4	− 8.8
26	305 28	14.0	9.1	0.2	29.0	37	760	. .	840	. .	800	36.4	305 31 5.4	. .	− 1 24.6	356 36 2.0	+ 2 2
27	78 58	14.3	9.7	4.5	28.0	35	. .	. .	. .	500	560	36.4	79 1 39.9	. .	+ 5 3.6	130 13 4.7	− 8.7
28	22 18	14.0	10.8	3.2	27.9	32	. .	500	. .	555	. .	36.4	22 22 26.3	. .	+ 25.0	73 29 12.5	+ 6.1
29	311 36	12.8	10.0	1.8	29.2	33	060	. .	945	. .	065	36.4	311 40 20.2	. .	− 1 8.1	2 45 33.3	+ 3 4
30	25 30	18.1	12.9	14.5	0.0	37	. .	770	. .	830	. .	36.4	25 33 0.6	. .	+ 29.	76 39 50.8	+ 4.8
31	74 8	14.7	8.7	0.0	26.8	38	. .	940	. .	920	. .	36.4	74 10 49.3	. .	+ 3 31.4	125 20 41 9	− 7.8
32	10 26	16.7	13.5	6.5	0.3	31	. .	. .	. .	. .	320	36.4	10 30 42.7	. .	+ 11.3	61 37 15.2	+ 9.3
33	10 26	16.7	13.5	6.5	0.3	37	. .	. .	. .	. .	620	36.4	10 29 5.8	. .	+ 11.2	61 35 38.2	+ 9.3
34	10 26	16.7	13.5	6.5	0.3	27	. .	895	. .	. .	. .	36.4	10 31 18.9	. .	+ 11.2	61 37 51.3	+ 9.3
35	10 26	16.7	13.5	6.5	0.3	37	. .	920	. .	. .	. .	36.4	10 29 0.7	. .	+ 11.2	61 35 33.1	+ 9.3
36	10 26	16.7	13.5	6.5	0.3	35	. .	050	. .	. .	. .	36.4	10 29 44.7	. .	+ 11.3	61 36 17.2	+ 9.2
37	10 26	16.7	13.5	6.5	0.3	40	. .	650	. .	. .	. .	36.4	10 28 18.9	. .	+ 11.2	61 34 51.3	+ 9.1
38	26 54	13.0	7.6	1.9	25.7	32	. .	940	. .	995	. .	36.4	26 58 21.4	. .	+ 31.0	78 5 13.6	+ 3.5
39	70 22	16.0	10.8	3.7	28.5	32	. .	. .	. .	180	220	36.4	70 26 30.4	. .	+ 2 50.0	121 35 41.6	− 7.0
40	70 22	16.0	10.8	3.7	28.5	32	. .	. .	. .	630	660	36.4	70 26 23.6	. .	+ 2 50.0	121 35 34.8	− 7.0
41	6 40	20.8	17.3	9.8	3.8	34	. .	. .	. .	700	750	36.4	6 43 46.7	. .	+ 7.2	57 50 15.1	+ 2.4
42	33 16	13.0	8.2	1.9	26.7	32	. .	850	. .	870	. .	36.4	33 20 22.6	. .	+ 40.1	84 27 23.9	+ 1.0
43	10 30	16.5	13.2	5.5	0.5	34	. .	845	. .	900	. .	36.4	10 33 48.0	. .	+ 11.4	61 40 20.6	+ 3.3
44	76 24	14.7	8.8	1.2	27.2	33	. .	350	. .	. .	. .	36.4	76 28 14.1	. .	+ 4 8.8	127 38 44.1	− 7.8
45	76 24	14.7	8.8	1.2	27.2	36	. .	. .	. .	620	. .	36.4	76 24 51.8	. .	+ 4 7.8	127 35 20.8	− 7.8
46	76 24	14.7	8.8	1.2	27.2	37	. .	. .	. .	680	. .	36.4	76 29 41.1	. .	+ 4 9.4	127 40 11.7	− 7.8
47	76 24	14.7	8.8	1.2	27.2	36	. .	. .	. .	560	490	36.4	76 27 25.9	. .	+ 4 8.6	127 37 55.7	− 7.8
48	36 16	15.0	8.8	1.8	26.7	36	. .	065	. .	105	. .	36.4	36 19 32.7	. .	+ 44.9	87 26 38.8	− 0.1
49	16 24	14.5	10.3	3.0	28.2	33	. .	700	. .	760	. .	36.4	16 28 7.9	. .	+ 18.1	67 34 47.2	+ 5.1
50	25 20	10 18.5	14.3	7.2	1.6	30	. .	. .	. .	870	910	36.4	25 24 47.4	. .	+ 29.0	76 31 37.6	+ 2.6

No.	Barom.	At. Ther.
	in.	°
6	29.98	39.0
14	30.07	38.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
5	− 6.1	−16 9.3	. .	− 16 15.4
6	− 6.1	+16 9.3	. .	+ 16 3.2

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	CORRECTIONS. Inst.	Clock appar'nt.	Clock adopted.	Apparent Right Ascension.	Miscellan's Corrections.
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Mar. 8	1	B. A. C. 2758	E.	24.6	27.7	29.7	37.3	39.8	42.4	50.2	52.0	55.0	6 39.86	+ 0.14	. .	−14.21	8 6 25.79	− 1.05
	2	O. Arg. N. 8887	E.	16.7	20.8	23.0	33.0	36.2	39.4	49.1	51.6	55.7	14 36.17	− 0.39	. .	−14.21	8 14 21.57	− 2.26
	3	O. Arg. N. 9001	E.	33.4	37.5	39.6	49.4	52.6	55.9	5.6	8.1	12.2	20 52.70	− 0.39	. .	−14.21	8 20 38.10	− 2.31
	4	O. Arg. N. 9029	E.	32.0	36.0	38.6	48.5	51.7	54.9	4.6	7.1	11.2	21 51.62	− 0.39	. .	−14.21	8 21 37.02	− 2.32
	5	O. Arg. N. 9058	E.	44.3	48.4	51.0	0.6	3.9	7.1	16.9	19.5	23.6	24 3.92	− 0.39	. .	−14.21	8 23 49.32	− 2.33
	6	O. Arg. N. 9125	E.	40.0	44.0	46.5	56.1	59.4	2.6	12.4	14.9	18.8	29 59.41	− 0.39	. .	−14.22	8 29 44.80	− 2.38
	7	O. Arg. N. 9187	E.	11.9	16.0	18.3	28.1	31.4	34.5	44.4	46.6	50.8	33 31.33	− 0.39	. .	−14.22	8 33 16.72	− 2.41
9	8	B. A. C. 7022	F.	. .	. .	. .	. .	. .	. .	. .	11.4	14.9	17 58.83	− 0.23	. .	−15.39	20 17 43.21	+ 1.26
	9	Venus II, N.	F.	52.2	54.9	56.8	3.1	5.3	7.4	13.6	15.4	18.3	24 5.22	+ 0.05	. .	−15.39	20 23 49.88	− 0.72
	10	Venus, S.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	11	α Cephei	F.	. .	. .	. .	48.6	53.2	57.5	6.0	9.2	14.7	15 48.61	− 0.46	. .	−15.42	21 15 32.73	+ 0.08
	12	ε Pegasi	F.	5.0	7.7	9.2	15.3	17.4	19.5	25.7	27.1	29.9	38 17.42	− 0.07	−15.50	−15.44	21 38 1.91	+ 0.07
10	13	Sun I, S.	F.	. .	. .	27.8	29.8	31.8	33.9	35.9	. .	. .	21 31.84	− 0.01	. .	−15.50	23 21 16.33	. .
	14	Sun II, N.	F.	29.3	31.9	33.4	39.5	41.6	43.6	49.8	51.2	53.7	23 41.56	− 0.01	. .	−15.50	23 23 26.05	. .
	15	B. A. C. 334	F.	43.6	46.6	48.6	56.1	58.5	1.0	8.5	10.4	13.5	2 58.53	− 0.19	. .	−15.55	1 2 42.79	+ 1.48
	16	Polaris	F.	. .	. .	21.0	47.0	12.0	13.0	7.0	. .	. .	12 14.00	− 9.52	. .	−15.55	1 11 48.93	− 2.12
	17	β Arietis	F.	46.0	48.7	50.3	57.0	59.0	1.2	7.8	9.4	12.0	47 59.04	− 0.12	−15.61	−15.58	1 47 43.34	+ 0.05
	18	α Arietis	F.	9.4	12.0	13.6	. .	. .	. .	31.5	33.0	35.8	0 22.55	− 0.13	−15.56	−15.59	2 0 6.83	− 0.02
	19	β Geminorum	F.	. .	. .	. .	. .	. .	1.8	6.5	8.1	11.0	37 57.12	− 0.21	−15.74	−15.78	7 37 41.13	− 0.07
	20	λ Ursæ Minoris, S. P.	F.	. .	. .	55.0	3.0	16.0	28.0	36.0	. .	. .	48 15.60	+14.14	. .	−15.78	19 48 13.96	− 2.23
	21	15 Argus	F.	16.7	19.5	21.0	. .	. .	. .	39.0	40.6	43.5	2 30.05	+ 0.04	−15.82	−15.79	8 2 14.30	− 0.03
	22	B. A. C. 2774	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	23	B. A. C. 2805	F.	39.4	42.5	44.4	52.0	54.7	57.2	4.7	6.6	9.9	16 54.60	+ 0.11	. .	−15.79	8 16 38.92	− 1.05
	24	B. A. C. 2941	F.	44.8	48.2	50.4	58.5	0.8	3.4	11.6	13.6	16.8	36 0.90	+ 0.14	. .	−15.80	8 35 45.24	− 1.12
	25	ε Hydræ	F.	14.2	16.7	18.3	24.5	26.5	28.6	34.9	36.3	38.9	40 26.54	− 0.10	−15.78	−15.81	8 40 10.63	− 0.07
	26	α Hydræ	F.	31.5	34.2	35.7	41.8	43.9	45.9	52.0	53.5	56.3	21 43.87	− 0.04	−15.85	−15.83	9 21 28.00	− 0.01
	27	α Leonis	F.	47.9	50.5	52.0	. .	. .	. .	8.8	10.3	13.0	2 0.42	− 0.13	−15.85	−15.85	10 1 44.44	− 0.04
	28	γ^1 Leonis	F.	12.0	13.7	18.0	20.3	22.5	24.6	26.8	31.3	32.9	13 22.46	− 0.17	−15.80	−15.85	10 13 6.44	− 0.07
	29	Venus II, N.	Sk.	27.0	29.7	31.3	37.8	40.0	42.2	48.5	50.0	53.0	28 39.94	− 0.06	. .	−16.03	20 28 23.85	− 0.71
	30	Venus, S.	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	31	α Cygni	Sk.	7.6	11.4	13.5	22.3	25.0	27.9	36.6	38.7	42.5	37 25.06	− 0.33	−15.99	−16.07	20 37 8.64	− 0.06
	32	ζ Cygni	Sk.	37.9	41.0	42.7	49.7	52.0	54.4	1.6	3.2	6.3	7 52.09	− 0.26	−16.07	−16.09	21 7 35.74	− 0.01
	33	ε Pegasi	Sk.	5.7	8.4	9.9	16.0	18.1	20.3	26.5	27.9	30.4	38 18.13	− 0.17	−16.09	−16.10	21 38 1.86	0.00
	34	α Aquarii	Sk.	25.0	27.5	29.0	35.0	37.3	39.3	45.4	46.9	49.7	59 37.23	− 0.13	−16.17	−16.12	21 59 20.98	+ 0.08
11	35	Sun I, N.	Sk.	1.2	3.7	5.2	11.4	13.5	15.5	21.8	23.3	25.7	25 13.48	− 0.12	. .	−16.15	23 24 57.21	. .
	36	Sun II, S.	Sk.	10.6	13.0	14.6	20.7	22.8	24.9	31.0	32.6	35.3	27 22.83	− 0.12	. .	−16.15	23 27 6.56	. .
	37	Polaris	Sk.	37.5	25.0	29.0	21.0	46.0	14.0	41.0	9.0	. .	12 14.94	− 8.84	. .	−16.21	1 11 49.89	− 0.84
	38	θ^1 Ceti	Sk.	. .	. .	58.0	0.2	2.3	4.4	6.3	. .	. .	18 2.24	− 0.10	−16.32	−16.21	1 17 45.93	+ 0.13
	39	β Arietis	Sk.	46.7	49.4	51.0	57.5	59.8	2.0	8.5	10.0	12.8	47 59.74	− 0.21	−16.23	−16.23	1 47 43.30	+ 0.02
	40	α Arietis	Sk.	10.0	12.8	14.4	21.1	23.4	25.6	32.3	33.9	36.7	0 23.36	− 0.22	−16.19	−16.23	2 0 6.81	− 0.03
	41	Moon I, S.	Sk.	21.2	24.0	25.6	32.2	34.5	36.8	43.4	45.0	47.8	47 34.50	− 0.20	. .	−16.29	2 47 18.01	+72.01
	42	B. A. C. 7022	E.	44.7	48.0	50.1	57.9	0.6	3.3	11.3	13.3	16.7	18 0.66	− 0.37	. .	−16.92	20 17 43.37	+ 1.21
	43	Venus II, N.	E.	2.3	5.0	6.7	13.1	15.3	17.4	23.9	25.5	28.2	33 15.27	+ 0.19	. .	−16.93	20 32 58.53	− 0.70
	44	Venus, S.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. . .	. . . .	. .
	45	α Cygni	E.	. .	. .	23.2	26.1	28.9	31.8	37.6	39.8	43.3	37 26.05	− 0.44	−16.86	−16.99	20 37 8.62	− 0.09
	46	ζ Cygni	E.	38.9	41.8	43.6	50.6	53.0	55.4	2.5	4.1	7.1	7 53.00	− 0.25	−16.97	−17.00	21 7 35.75	− 0.02
	47	α Cephei	E.	24.0	29.7	33.0	46.0	50.3	54.7	8.0	11.2	16.6	15 50.39	− 0.84	. .	−17.01	21 15 32.54	− 0.17
	48	ε Pegasi	E.	6.6	9.0	10.6	16.9	19.0	21.0	27.3	28.8	31.3	38 18.94	− 0.06	−16.99	−17.01	21 38 1.87	− 0.01
12	49	Sun I, S.	E.	42.2	44.7	46.4	52.3	54.4	56.5	2.6	4.2	6.7	28 54.44	+ 0.06	. .	−17.00	23 28 37.50	. .
	50	Sun II, N.	E.	51.6	54.1	55.7	1.9	3.9	5.9	12.2	13.6	16.2	31 3.90	+ 0.06	. .	−17.00	23 30 46.96	. .

2, 3, 5, 6, 7. Wire A used.
41. Bisections at wires III–V.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	75 42	10 15.5	9.7	3.3	28.0	37	. .	450	. .	510	. .	36.4	75 45 9.9	. .	+ 3 56.9	126 55 28.0	− 7.6
2	347 42	16.0	10.7	3.0	28.9	32	. .	700	. .	705	. .	36.4	347 48 56.1	. .	− 13.2	38 55 4.1	+11.7
3	347 42	16.0	10.7	3.0	28.9	32	. .	415	. .	400	. .	36.4	347 49 0.6	. .	− 13.2	38 55 8.6	+11.3
4	347 42	16.0	10.7	3.0	28.9	33	. .	520	. .	480	. .	36.4	347 46 11.0	. .	− 13.3	38 52 18.9	+11.2
5	347 42	16.0	10.7	3.0	28.9	33	. .	970	. .	960	. .	36.4	347 48 36.6	. .	− 13.2	38 54 44.6	+11.0
6	347 42	16.0	10.7	3.0	28.9	36	. .	980	. .	985	. .	36.4	347 47 50.6	. .	− 13.2	38 53 58.6	+10.6
7	347 42	16.0	10.7	3.0	28.9	36	. .	560	. .	570	. .	36.4	347 47 57.0	27.5	− 13.3	38 54 54.9	+10.3
8	358 58	16.7	12.5	3.3	2.5	31	. .	. .	. .	778	792	37.8	359 2 37.4	. .	− 1.0	50 8 57.6	−21.1
9	56 36	16.7	10.8	1.7	29.6	32	. .	462	. .	554	. .	37.8	56 40 27.0	38.0	+ 1 30.4	107 48 18.6	+ 0.9
10	56 36	16.7	10.8	1.7	39.6	31	158	. .	. .	. .	304	37.8	56 40 46.5	. .	+ 1 30.4	107 48 38.1	−18.6
11	336 46	11.0	7.6	26.4	25.7	30	. .	. .	. .	604	620	37.8	336 51 2.0	. .	− 25.3	27 56 57.9	+ 2.8
12	29 30	17.2	12.1	4.0	0.3	29	. .	510	. .	528	. .	37.8	29 35 11.8	. .	+ 33.6	80 42 6.6	+ 4.6
13	43 8	21.5	13.0	7.7	1.6	32	100	120	. .	. .	. .	37.8	43 12 28.6	47.4	+ 54.8	94 19 44.6	. .
14	42 36	18.7	13.8	7.7	1.4	32	. .	. .	. .	954	964	37.8	42 40 17.8	. .	+ 53.8	93 47 32.8	. .
15	3 52	17.8	13.3	4.5	29.6	33	786	778	. .	790	796	37.8	3 56 6.3	. .	+ 4.0	55 2 31.5	+ 2.5
16	310 12	22.2	16.7	7.3	5.0	33	860	880	882	900	916	37.8	310 16 0.6	48.2	− 1 8.7	1 21 13.1	+ 0.5
17	18 38	19.1	15.3	9.0	1.6	35	. .	864	. .	878	. .	37.8	18 41 31.7	. .	+ 19.8	69 48 12.7	+ 2.0
18	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. . .	. . . . .	47.2	. .	. . . . .	. .
19	10 30	25.6	21.5	10.4	8.2	34	. .	. .	. .	766	782	41.5	10 33 47.5	. .	+ 11.2	61 40 19.9	+ 2.7
20	307 46	18.7	13.2	8.2	1.6	32	624	632	630	610	590	41.5	307 50 25.7	34.0	− 1 17.3	358 55 29.6	+ 1.0
21	62 44	19.5	13.0	4.5	0.9	32	. .	160	. .	172	. .	41.5	62 48 33.6	. .	+ 1 56.6	113 56 51.4	+ 3.5
22	74 18	19.6	11.2	2.6	29.8	35	. .	. .	. .	748	760	41.5	74 21 40.0	. .	+ 3 31.9	125 31 33.1	− 7.8
23	74 52	22.2	13.6	4.1	2.4	36	524	558	. .	686	696	41.5	74 55 24.1	. .	+ 3 40.2	126 5 25.5	− 7.8
24	78 34	20.5	13.8	2.8	0.1	33	. .	. .	. .	536	540	41.5	78 38 12.8	. .	+ 4 52.0	129 49 26.0	− 8.0
25	31 56	18.9	13.2	4.8	0.4	32	. .	. .	. .	468	482	41.5	32 0 29.6	. .	+ 37.7	83 7 28.5	+ 2.5
26	46 56	20.5	13.8	5.4	1.0	35	. .	. .	. .	250	264	41.5	46 59 46.0	. .	+ 1 4.7	98 7 11.9	+ 3.6
27	26 14	20.3	15.5	6.7	0.5	31	. .	874	. .	880	. .	41.5	26 18 37.0	. .	+ 29.9	77 25 28.1	+ 3.9
28	18 20	16.0	10.7	3.1	3.1	30	. .	. .	. .	710	714	41.5	18 24 57.8	30.4	+ 20.2	69 31 39.2	+ 0.1
29	56 26	19.2	14.1	6.5	1.9	35	. .	512	. .	578	. .	39.4	56 29 38.8	. .	+ 1 30.1	107 37 30.1	. .
30	56 26	19.2	14.1	6.5	1.9	34	132	. .	. .	. .	240	39.4	56 29 59.6	. .	+ 1 30.1	107 37 50.9	. .
31	354 0	18.6	16.0	6.3	1.7	34	. .	080	. .	082	. .	39.4	354 4 1.5	39.9	− 6.2	45 10 16.5	+ 0.5
32	9 6	18.9	15.5	6.8	1.9	30	. .	718	. .	732	. .	39.4	9 10 52.6	. .	+ 9.6	60 17 23.4	+ 1.4
33	29 30	21.4	17.1	7.9	5.0	29	. .	490	. .	650	. .	39.4	29 35 8.1	. .	+ 33.7	80 42 3.0	+ 1.0
34	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . . .	. .	. .	. . . . .	. .
35	42 12	19.3	14.0	7.0	3.5	31	084	135	. .	. .	. .	39.4	42 16 45.5	. .	+ 53.2	93 23 59.9	. .
36	42 44	16.3	10.4	3.4	27.6	30	. .	. .	. .	607	730	39.4	42 48 57.9	49.2	+ 54.2	93 56 13.3	. .
37	310 12	16.8	15.5	6.0	3.0	34	050	. .	938	. .	000	39.4	310 16 3.0	. .	− 1 8.6	1 21 15.6	+ 2.7
38	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
39	18 38	12.8	12.5	4.0	28.5	35	. .	938	. .	026	. .	39.4	18 41 35.8	52.8	+ 19.6	69 48 16.6	+ 5.8
40	15 58	16.2	13.6	6.1	0.8	37	. .	508	. .	540	. .	39.4	16 1 10.0	. .	+ 16.6	67 7 47.8	+ 5.3
41	20 40	15.5	12.4	5.3	0.5	35	020	. .	430	. .	622	39.4	20 43 43.8	53.3	+ 21.9	71 50 26.9	. .
42	358 58	16.0	14.0	5.6	29.5	31	. .	960	. .	010	. .	38.0	359 2 34.0	53.0	− 1.0	50 8 54.2	−21.4
43	56 14	16.4	12.7	5.7	29.7	32	265	. .	. .	. .	365	38.0	56 18 28.6	. .	+ 1 26.7	107 26 16.5	. .
44	56 14	16.4	12.7	5.7	29.7	31	. .	045	. .	050	. .	38.0	56 18 48.2	. .	+ 1 26.7	107 26 36.1	. .
45	354 0	25.2	22.0	11.5	9.2	33	. .	. .	. .	635	675	38.0	354 4 0.9	. .	− 6.0	45 10 16.1	− 0.1
46	9 6	19.0	16.7	7.8	2.7	30	. .	620	. .	. .	. .	38.0	9 10 51.8	. .	+ 9.3	60 17 22.3	+ 0.2
47	336 46	19.0	16.3	6.0	3.9	30	. .	260	. .	340	. .	38.0	336 50 57.7	. .	− 24.6	27 56 54.3	− 1.3
48	29 30	19.9	18.1	8.0	2.7	29	425	465	. .	500	540	38.0	29 35 8.8	. .	+ 32.6	80 42 2.6	+ 0.6
49	42 22	10 25.5	14.8	8.3	3.7	35	960	970	. .	. .	. .	38.0	42 25 27.7	. .	+ 51.5	93 32 40.4	. .
50	41 50	10 22.4	14.7	7.7	2.4	37	. .	. .	. .	065	120	38.0	41 53 13.3	66.5	+ 50.7	93 0 25.2	. .

No.	Barom.	At. Ther.
	in.	°
7	30.13	33.5
9	29.90	36.5
13	29.89	44.0
16	29.88	47.0
18	29.90	47.0
20	29.94	38.5
28	29.96	37.4
31	30.11	37.6
36	30.10	47.2
39	30.05	52.8
41	30.01	51.8
42	29.97	46.5
50	30.00	62.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
9	− 8.9	+ 9.8	. .	+ 0.9
10	− 8.9	− 9.8	+ 0.1	− 18.6
13	− 6.0	− 16 5.9	. .	− 16 11.9
14	− 6.0	+ 16 5.9	. .	+ 15 59.9
29	− 8.8	+ 10.5	. .	+ 1.7
30	− 8.8	− 10.5	+ 0.2	− 19.1
35	− 6.0	+ 16 6.7	. .	+ 16 0.7
36	− 6.0	− 16 6.7	. .	− 16 12.7
41	− 21 1.3	− 16 22.3	. .	− 37 23.6
43	− 8.7	+ 9.9	. .	+ 1.2
44	− 8.7	− 9.9	+ 0.2	− 18.4
49	− 5.9	− 16 7.6	. .	− 16 13.5
50	− 5.9	+ 16 7.6	. .	+ 16 1.7

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Mar. 12	1	B. A. C. 334 . .	E.	45.2	48.3	50.0	57.7	0.0	2.6	10.0	12.0	15.1	3 0.10	− 0.31	. .	−17.04	1 2 42.75	+ 1.48
	2	Polaris	E.	36.0	40.0	33.0	58.5	27.0	54.0	21.0	. .	17.0	12 26.61	−18.06	. .	−17.09	1 11 51.43	+ 0.99
	3	α Arietis	E.	10.9	13.6	15.4	21.9	24.0	26.2	33.0	34.7	37.5	0 24.13	− 0.18	−17.11	−17.11	2 0 6.84	+ 0.01
	4	η Tauri	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	5	Moon I, S. . .	E.	9.7	12.6	14.4	21.2	23.6	25.9	32.6	34.5	37.3	48 23.53	− 0.18	. .	−17.12	3 48 6.23	+74.14
	6	α² Geminorum . .	E.	41.6	44.6	46.4	53.6	56.0	58.5	5.7	7.5	10.6	26 56.06	− 0.26	−17.25	−17.22	7 26 38.58	+ 0.27
	7	α Canis Minoris .	E.	51.4	53.9	55.4	1.5	3.6	5.7	11.9	13.5	16.0	33 3.66	− 0.01	−17.27	−17.22	7 32 46.43	− 0.11
	8	β Geminorum . .	E.	44.6	47.5	49.3	56.1	58.5	0.9	7.8	9.6	12.4	37 58.52	− 0.21	−17.17	−17.22	7 37 41.09	− 0.08
	9	B. A. C. 2592 . .	E.	4.1	7.2	9.0	16.4	18.9	21.3	28.6	30.5	33.5	43 18.83	− 0.27	. .	−17.24	7 43 1.32	− 1.40
	10	λ Ursæ Minoris, S.P.	E.	. .	. .	51.0	3.0	16.0	29.0	. .	. .	. .	48 15.08	+22.62	. .	−17.22	19 48 20.48	+ 2.44
	11	B. A. C. 2676 . .	E.	32.9	35.7	37.4	44.0	46.2	48.5	55.0	56.6	59.5	56 46.20	− 0.16	. .	−17.24	7 56 28.80	− 1.29
	12	B. A. C. 2690 . .	E.	. .	. .	20.9	22.9	25.1	27.1	29.4	. .	. .	58 25.08	− 0.08	. .	−17.24	7 58 7.76	− 1.19
	13	15 Argus	E.	18.0	20.8	22.5	29.0	31.3	33.5	40.0	41.8	44.4	2 31.26	+ 0.25	−17.27	−17.23	8 2 14.28	− 0.02
	14	ε Hydræ	E.	15.5	18.0	19.7	25.8	27.8	29.9	36.0	37.6	40.2	40 27.83	− 0.02	−17.17	−17.24	8 40 10.57	− 0.11
	15	ι Ursæ Majoris, (R.)	E.	. .	. .	51.4	54.6	57.5	0.6	3.9	. .	. .	50 57.60	+ 0.45	. .	−17.24	8 50 40.81	+ 0.05
	16	σ² Ursæ Majoris . .	E.	12.0	18.5	22.8	38.8	44.4	49.7	5.8	9.6	16.6	0 44.24	− 1.04	. .	−17.25	8 59 25.95	− 0.31
	17	B. A. C. 3162 . .	E.	7.8	11.0	13.0	21.0	23.2	25.7	33.5	35.5	38.7	11 23.27	− 0.32	. .	−17.27	9 11 5.68	− 2.02
	18	1 Draconis . . .	E.	10.5	29.0	39.5	23.0	37.5	51.8	35.0	45.9	3.4	19 37.30	− 2.96	. .	−17.25	9 19 17.06	− 0.60
	19	α Hydræ	E.	. .	. .	41.3	43.4	45.4	47.4	49.5	. .	. .	21 45.40	+ 0.16	−17.53	−17.26	9 21 28.24	+ 0.24
13	20	Moon I, S. . . .	F.	57.3	0.3	2.2	9.1	11.6	13.7	21.0	22.7	25.6	52 11.50	− 0.20	. .	−17.43	4 51 53.78	+75.67
	21	β Orionis. . . .	F.	37.1	39.8	41.3	47.5	49.5	51.6	57.7	59.4	1.9	8 49.53	− 0.03	−17.45	−17.43	5 8 32.07	+ 0.02
	22	β Tauri	F.	27.5	30.4	32.2	39.0	41.4	43.7	50.7	52.4	55.4	18 41.41	− 0.30	−17.44	−17.43	5 18 23.68	− 0.01
	23	δ Orionis. . . .	F.	42.9	45.4	46.9	53.0	55.0	57.1	3.2	4 7	7.3	25 55.06	− 0.08	−17.41	−17.43	5 25 37.55	− 0.03
	24	22 Camelopardalis .	F.	49.2	46.5	0.7	18.2	23.8	29.7	47.0	51.3	58.8	5 23.91	− 1.14	. .	−17.44	6 5 5.33	+ 0.16
	25	B. A. C. 2012 . .	F.	. .	. .	57.7	59.8	1.8	4.0	6.0	. .	. .	9 1.86	− 0.18	. .	−17.44	6 8 44.24	− 0.55
	26	B. A. C. 2064 . .	F.	. .	. .	. .	. .	. .	19.9	24.4	25.9	28.8	18 15.42	− 0.26	. .	−17.45	6 17 57.71	− 0.66
	27	B. A. C. 2112 . .	F.	3.7	6.7	8.5	15.6	18.0	20.4	28.0	29.5	32.5	24 18.10	+ 0.17	. .	−17.45	6 24 0.82	− 0.53
	28	B. A. C. 2134 . .	F.	. .	30.7	32.8	35.0	37.2	39.3	43.7	45.2	48.0	27 34.99	− 0.23	. .	−17.45	6 27 17.31	− 0.70
	29	B. A. C. 2179 . .	F.	49.5	52.8	59.9	2.5	5.0	7.7	10.4	17.4	20.8	33 5.11	+ 0.24	. .	−17.45	6 32 47.90	− 0.56
	30	B. A. C. 2228 . .	F.	. .	. .	52.2	54.4	56.5	58.7	0.8	. .	. .	42 56.52	− 0.21	. .	−17.45	6 42 38.86	− 0.78
	31	B. A. C. 2288 . .	F.	32.1	35.5	37.3	4.8	7.3	9.8	17.4	19.1	22.3	53 7.29	+ 0.20	. .	−17.46	6 52 50.03	− 0.66
	32	B. A. C. 2313 . .	F.	52.0	55.0	56.6	3.1	5.3	7.6	14.2	15.8	18.7	58 5.37	− 0.26	. .	−17.46	6 57 47.65	− 0.93
	33	B. A. C. 2364 . .	F.	8.4	11.2	12.9	17.6	21.8	26.5	30.9	32.6	35.4	7 21.92	− 0.28	. .	−17.46	7 7 4.18	− 1.01
	34	B. A. C. 2462 . .	F.	28.4	31.0	32.4	38.7	40.8	42.8	49.0	50.6	53.2	20 40.77	− 0.15	. .	−17.46	7 20 23.16	− 0.94
	35	B. A. C. 2493 . .	F.	18.2	21.0	22.7	. .	. .	. .	. .	. .	. .	28 31.93	− 0.30	. .	−17.47	7 28 14.16	− 1.18
	36	B. A. C. 2506 . .	F.	45.7	48.6	50.3	56.9	59.2	1.5	8.2	9.7	12.7	30 59.20	− 0.27	. .	−17.47	7 30 41.46	− 1.16
	37	β Geminorum . .	F.	45.0	47.7	49.5	56.4	58.9	1.1	8.0	9.8	12.7	37 58.79	− 0.30	−17.36	−17.46	7 37 41.03	− 0.13
	38	B. A. C. 2564 . .	F.	29.6	32.0	33.5	39.9	42.0	44.2	50.3	51.7	54.5	39 41.97	− 0.17	. .	−17.47	7 39 24.33	− 1.06
	39	B. A. C. 2592 . .	F.	. .	. .	. .	. .	. .	. .	29.0	30.9	34.0	43 19.24	− 0.35	. .	−17.47	7 43 1.42	− 1.38
	40	λ Ursæ Minoris, S.P.	F.	. .	. .	56.0	5.0	15.0	. .	. .	. .	. .	48 16.06	+20.57	. .	−17.47	19 48 19.16	+ 0.26
	41	B. A. C. 2653 . .	F.	. .	. .	. .	. .	. .	. .	. .	19.9	22.7	52 10.30	− 0.11	. .	−17.47	7 51 52.72	− 1.05
	42	B. A. C. 2676 . .	F.	33.3	36.0	37.6	44.3	46.5	48.8	55.3	57.0	59.8	56 46.51	− 0.25	. .	−17.48	7 56 28.78	− 1.28
	43	B. A. C. 2690 . .	F.	. .	. .	21.2	23.3	25.4	27.5	29.7	. .	. .	58 25.42	− 0.18	. .	−17.48	7 58 7.76	− 1.18
	44	Uranus. . . .	F.	30.7	32.3	36.6	38.8	40.9	43.1	45.2	49.7	51.3	57 40.96	− 0.22	. .	−17.49	8 57 23.25	. .
	45	α Hydræ	F.	33.3	35.8	37.3	43.5	45.5	47.6	53.8	55.3	57.9	21 45.56	− 0.03	−17.57	−17.49	9 21 28.04	+ 0.05
	46	α Leonis	F.	49.6	52.2	53.8	59.9	2.0	4.2	10.4	12.0	14.8	2 2.10	− 0.18	−17.48	−17.50	10 1 41.42	− 0.06
	47	γ¹ Leonis	F.	. .	. .	. .	. .	26.5	28.6	33.0	34.6	37.3	13 24.24	− 0.24	−17.51	−17.50	10 13 6.50	− 0.01
	48	ρ Leonis	F.	20.6	23.1	24.7	31.0	33.2	35.0	41.2	43.0	45.4	26 33.02	− 0.16	−17.54	−17.51	10 26 15.35	− 0.04
16	49	Sun I, N. . . .	E.	21.9	24.5	26.0	32.0	34.1	36.2	42.4	43.9	46.4	43 34.16	+ 0.35	. .	−18.41	23 43 16.10	. .
	50	Sun II, S. . . .	E.	31.3	33.5	35.4	41.4	43.4	45.3	51.6	53.0	55.9	45 43.42	+ 0.35	. .	−18.41	23 45 25.36	. .

3, 15. Telescope micrometer reading increased one revolution in reduction.
18, 24. Bisections at sets B and D.
20. Bisections at wires II–VI.
37. Telescope micrometer reading decreased two revolutions in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	3 52	10 24.4	20.4	11.5	9.4	33	. .	250	. .	270	. .	38.0	3 56 6.8	. .	+ 3.9	55 2 31.9	+ 2.2
2	310 12	20.2	18.4	8.5	6.6	33	980	. .	990	. .	020	38.0	310 15 58.6	. .	− 1 6.5	1 21 13.3	+ 0.1
3	15 58	17.5	16.0	9.0	3.9	36	. .	300	. .	330	. .	38.0	16 1 9.5	. .	+ 16.2	67 7 46.9	+ 4.3
4	15 6	18.5	18.2	9.1	4.8	32	. .	. .	. .	770	790	38.0	15 10 18.3	. .	+ 15.3	66 16 54.8	+ 3.8
5	15 40	20.8	17.8	9.5	1.0	37	325	590	720	910	010	38.0	15 43 2.8	65.0	+ 15.9	66 49 39.9	. .
6	6 40	23.5	20.2	9.8	3.0	34	. .	845	. .	910	. .	39.8	6 43 46.1	. .	+ 6.9	57 50 14.2	+ 1.7
7	33 16	20.8	6.7	5.5	0.6	32	. .	950	. .	960	. .	39.8	33 20 18.6	52.0	+ 38.2	84 27 18.0	− 4.0
8	10 30	24.8	20.9	9.1	5.0	34	. .	740	. .	780	. .	39.8	10 33 47.0	. .	+ 10.8	61 40 19.0	+ 1.9
9	5 16	23.7	18.3	7.5	2.7	31	. .	715	. .	765	. .	39.8	5 20 35.2	. .	+ 5.6	56 27 2.0	+ 9.3
10	307 46	20.5	17.0	4.0	2.0	32	. .	675	. .	645	. .	39.8	307 50 23.0	. .	− 1 14.7	358 55 29.5	+ 1.3
11	16 24	19.0	14.6	5.0	27.4	33	. .	785	. .	805	. .	39.8	16 28 7.7	. .	+ 17.2	67 34 46.1	+ 5.3
12	25 20	24.3	20.2	8.7	2.7	30	. .	855	. .	820	. .	39.8	25 24 48.0	. .	+ 27.6	76 31 36.8	+ 2.6
13	62 44	21.0	15.2	4.5	0.2	31	. .	860	. .	880	. .	39.8	62 48 35.7	. .	+ 1 52.8	113 56 49.7	+ 1.5
14	31 56	21.5	17.0	6.0	0.7	32	. .	100	. .	180	. .	39.8	32 0 30.6	. .	+ 36.5	83 7 28.3	+ 2.3
15	189 34	26.1	24.8	10.6	6.5	32	000	040	. .	025	065	39.8	189 38 10.7	. .	+ 9.9	41 28 0.6	− 0.2
16	331 12	24.0	20.6	8.8	5.0	35	. .	565	. .	580	. .	39.8	331 15 35.6	. .	− 32.1	22 21 24.7	− 1.4
17	1 30	21.2	18.3	6.7	1.5	35	. .	105	. .	115	. .	39.8	1 33 41.8	. .	+ 1.6	52 40 7.6	+ 4.6
18	316 58	20.0	16.5	4.9	1.5	35	000	. .	. .	. .	930	39.8	317 1 48.5	48.0	− 54.5	8 7 15.2	+ 2.2
19	46 56	19.3	15.3	5.2	29.8	35	. .	. .	. .	120	110	39.8	46 59 46.7	. .	+ 1 2.7	98 7 10.6	+ 2.1
20	12 16	23.9	17.9	9.4	4.7	31	062	125	236	314	364	41.0	12 20 43.3	51.4	+ 12.7	63 27 17.2	. .
21	47 10	18.2	12.4	2.9	27.8	36	. .	352	. .	376	. .	41.0	47 13 30.6	. .	+ 1 2.9	98 20 54.7	+ 1.9
22	10 20	12.5	8.7	29.2	23.4	37	. .	. .	. .	400	412	41.0	10 23 19.7	. .	+ 10.7	61 29 51.6	+ 1.6
23	39 12	17.2	11.7	2.4	27.4	32	. .	662	. .	674	. .	41.0	39 16 27.9	. .	+ 47.7	90 23 36.8	+ 1.4
24	329 28	23.8	19.5	7.2	4.7	32	986	. .	. .	. .	996	41.0	329 32 16.5	. .	− 34.5	20 38 3.2	+ 2.5
25	26 14	18.8	14.5	3.6	29.2	35	. .	. .	. .	125	140	41.0	26 17 48.8	. .	+ 29.0	77 24 39.0	+ 5.3
26	15 26	11.9	10.0	29.7	24.4	36	144	154	. .	. .	. .	41.0	15 29 37.7	. .	+ 16.3	66 36 15.2	+ 8.9
27	71 4	12.2	7.2	24.7	22.7	32	964	988	. .	. .	. .	41.0	71 8 28.0	. .	+ 2 50.8	122 17 40.0	− 7.7
28	19 18	10.3	15.0	5.3	29.0	35	. .	. .	. .	120	142	41.0	19 21 48.2	. .	+ 20.7	70 28 30.1	+ 7.4
29	76 48	12.7	8.6	27.7	23.6	33	782	802	. .	. .	. .	41.0	76 52 14.0	. .	+ 4 7.7	128 2 42.9	− 8.7
30	22 28	21.1	17.4	7.4	1.8	31	. .	804	. .	820	. .	41.0	22 32 36.4	. .	+ 24.5	73 39 22.1	+ 5.9
31	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	43.2	. .	. . . .	. .
32	16 0	12.4	9.9	29.8	24.5	35	060	050	. .	. .	. .	41.0	16 3 54.2	. .	+ 17.0	67 10 32.4	+ 7.7
33	13 44	14.3	11.2	2.5	26.4	37	. .	374	. .	386	. .	41.0	13 47 17.0	. .	+ 14.5	64 53 52.7	+ 8.2
34	30 16	14.8	11.4	1.2	25.4	31	. .	878	. .	880	. .	41.0	30 20 41.5	. .	+ 34.8	81 27 37.5	+ 2.4
35	11 40	14.5	10.7	1.0	25.3	38	564	536	. .	. .	. .	41.0	11 42 59.6	. .	+ 12.3	62 49 33.1	+ 8.0
36	14 12	16.4	11.5	3.9	27.4	38	. .	586	. .	594	. .	41.0	14 14 57.2	. .	+ 15.1	65 21 33.5	+ 7.2
37	10 30	14.5	10.7	1.0	25.8	37	580	564	. .	. .	. .	41.0	10 33 45.0	. .	+ 11.1	61 40 17.3	+ 0.3
38	27 44	14.8	9.9	29.2	25.1	31	. .	470	. .	490	. .	41.0	27 48 48.6	. .	+ 31.4	78 55 41.2	+ 2.6
39	5 16	16.2	12.0	2.5	27.9	32	. .	110	. .	136	. .	41.0	5 20 36.5	. .	+ 5.6	56 27 3.3	+ 9.4
40	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
41	36 6	16.0	9.4	29.6	24.7	36	. .	. .	. .	516	512	41.0	36 19 31.6	. .	+ 43.8	87 26 36.6	− 0.2
42	16 24	14.2	10.2	1.7	25.0	34	. .	192	. .	198	. .	41.0	16 28 6.6	. .	+ 17.6	67 34 45.4	+ 5.4
43	25 20	16.3	12.2	1.7	26.7	31	. .	. .	. .	532	536	41.0	25 24 46.2	39.4	+ 28.3	76 31 35.7	+ 2.6
44	20 50	17.3	14.0	3.7	28.0	30	. .	040	. .	040	. .	41.0	20 55 7.2	. .	+ 22.9	72 1 51.3	. .
45	46 56	11.5	5.8	25.9	22.9	35	. .	898	. .	900	. .	41.0	46 59 44.0	37.0	+ 1 4.2	98 7 9.4	+ 0.8
46	26 14	20.0	15.6	5.1	0.4	31	. .	946	. .	952	. .	41.0	26 18 35.9	. .	+ 29.7	77 25 26.8	+ 2.6
47	18 20	13.5	10.3	0.4	25.1	30	. .	. .	. .	860	850	41.0	18 24 58.5	. .	+ 20.0	69 31 39.7	+ 0.8
48	28 52	15.0	9.6	1.2	26.7	33	. .	428	. .	442	. .	41.0	28 56 17.8	36.5	+ 33.2	80 3 12.2	+ 4.4
49	40 14	24.0	20.0	9.2	3.8	31	510	585	. .	. .	. .	41.6	40 18 37.7	. .	+ 48.1	91 25 47.0	. .
50	40 46	23.5	19.4	8.3	3.7	30	. .	. .	. .	815	845	41.6	40 50 50.9	58.0	+ 49.0	91 58 1.1	. .

No.	Barom.	At. Ther.
	in.	°
5	29.96	62.0
7	30.02	54.0
18	30.01	51.0
20	29.99	51.5
31	30.02	37.0
43	30.05	43.0
48	30.10	40.5
50	29.64	54.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
5	−15 56.1	− 16 15.9	. .	− 32 12.0
20	−12 25.7	− 16 7.6	. .	− 28 33.3
44	− 0.2	. . .	. .	− 0.2
49	− 5.7	+ 16 7.0	. .	+ 16 1.3
50	− 5.8	− 16 7.0	. .	− 16 12.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Mar. 16	1	B. A. C. 334 . .	E.	46.4	49.6	51.5	58.7	1.4	3.9	11.4	13.3	16.4	3 1.40	− 0.17	. .	−18.44	1 2 42.79	+ 1.50
	2	Polaris	E.	. .	45.0	52.0	. .	38.0	2.0	28.0	. .	. .	12 36.33	−28.22	. .	−18.49	1 11 49.62	+ 0.45
	3	β Arietis	E.	. .	. .	. .	. .	. .	. .	10.4	11.9	14.8	48 1.65	+ 0.06	− 18.45	−18.51	1 47 43.20	− 0.04
	4	B. A. C. 2228 . .	E.	44.4	47.0	48.7	55.3	57.4	59.5	5.8	7.3	10.0	42 57.27	+ 0.11	. .	−18.58	6 42 38.80	− 0.73
	5	B. A. C. 2255 . .	E.	42.0	44.6	46.3	52.6	54.7	56.8	3.1	4.6	7.4	47 54.68	+ 0.15	. .	−18.58	6 47 36.25	− 0.75
	6	ε Canis Majoris. .	E.	47.3	50.2	52.0	58.9	1.4	3.8	10.5	12.5	15.4	54 1.33	+ 0.72	−18.62	−18.57	6 53 43.48	0.00
	7	δ Canis Majoris. .	E.	. .	. .	. .	34.8	37.1	39.4	. .	47.9	51.0	3 37.15	+ 0.68	−18.63	−18.57	7 3 19.26	+ 0.01
	8	δ Geminorum . .	E.	45.7	48.3	50.0	56.6	58.8	1.2	7.6	9.4	12.0	12 58.84	+ 0.02	−18.52	−18.57	7 12 40.29	− 0.11
	9	λ Ursæ Minoris, S. P.	E.	58.0	42.0	19.0	48.0	55.0	3.0	. .	. .	. .	48 5.30	+37.09	. .	−18.58	19 48 23.81	+ 2.49
	10	Moon I, N. . .	E.	40.7	43.6	45.2	52.4	54.6	57.0	4.0	5.8	8.6	3 54.66	− 0.03	. .	−18.62	8 3 36.01	+72.35
17	11	Sun I, S. . . .	F.	1.2	3.8	5.3	11.5	13.6	15.6	21.8	23.3	25.9	47 13.56	+ 0.23	. .	−18.70	23 46 55.09	. .
	12	Sun II, N. . . .	F.	10.6	13.0	14.6	20.8	22.8	24.7	31.0	32.5	35.0	49 22.78	+ 0.23	. .	−18.70	23 49 4.31	. .
	13	Polaris	F.	. .	. .	37.0	3.0	29.0	56.0	22.0	. .	. .	12 29.40	−22.90	. .	−18.71	1 11 47.79	+ 0.01
	14	β Arietis	F.	48.9	51.7	53.3	59.9	2.0	4.2	10.6	12.3	15.0	48 1.99	− 0.08	−18.65	−18.71	1 47 43.20	− 0.04
	15	α Arietis	F.	12.4	15.0	16.7	23.5	25.6	27.8	34.5	36.1	38.9	0 25.61	− 0.01	− 18.79	−18.72	2 0 6.88	+ 0.08
	16	δ Geminorum . .	F.	45.9	48.7	50.3	56.9	59.2	1.4	8.0	9.7	12.4	12 59.17	− 0.06	−18.78	−18.78	7 12 40.33	− 0.06
	17	B. A. C. 2471 . .	F.	8.0	11.0	12.7	20.2	22.7	25.2	32.6	34.4	37.6	22 22.71	+ 0.52	. .	−18.78	7 22 4.45	− 0.70
	18	α^2 Geminorum . .	F.	43.0	45.9	47.8	55.0	57.5	59.9	7.0	9.0	11.9	26 57.44	− 0.19	−18.78	−18.78	7 26 38.47	+ 0.24
	19	α Canis Minoris. .	F.	52.6	55.3	56.8	2.9	5.0	7.0	13.2	14.8	17.3	33 4.99	+ 0.11	−18.79	−18.78	7 32 46.32	− 0.15
	20	β Geminorum . .	F.	46.1	49.0	50.8	57.7	0.0	2.4	9.1	11.0	13.9	38 0.00	− 0.14	−18.79	−18.78	7 37 41.08	− 0.02
	21	λ Ursæ Minoris, S. P.	F.	. .	. .	50.0	2.0	9.0	18.0	28.0	. .	. .	48 9.40	+32.12	. .	−18.78	19 48 22.74	+ 0.59
	22	ε Hydræ	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	23	Moon I, N. . .	F.	12.9	15.6	17.2	24.0	26.3	28.5	35.3	37.0	39.6	1 26.27	− 0.06	. .	−18.80	9 1 7.41	+69.43
22	24	Venus I, N. . .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	25	Venus II, S. . .	Sk.	. .	. .	35.0	37.1	39.2	41.3	43.5	. .	. .	23 39.22	− 0.20	. .	−24.02	21 23 15.00	− 0.63
	26	ε Pegasi	Sk.	13.8	16.5	18.0	24.1	26.2	28.4	34.5	36.2	38.8	38 26.28	− 0.20	−23.98	−24.04	21 38 2.04	− 0.05
	27	α Aquarii. . . .	Sk.	33.0	35.6	37.1	43.4	45.5	47.5	53.7	55.4	58.0	59 45.47	− 0.20	−24.13	−24.05	21 59 21.22	+ 0.11
	28	B. A. C. 7923 . .	Sk.	. .	. .	27.0	29.2	31.7	34.0	36.4	. .	. .	37 31.66	− 0.19	. .	−24.07	22 37 7.40	+ 1.31
	29	α Pegasi	Sk.	42.8	45.4	46.9	53.2	55.4	57.5	3.8	5.4	8.0	58 55.38	− 0.20	−24.07	−24.09	22 58 31.09	+ 0.01
23	30	Sun I, N. . . .	Sk.	58.0	0.2	1.9	8.1	10.0	12.0	18.2	19.7	22.5	9 10.07	− 0.20	. .	−24.14	0 8 45.73	. .
	31	Sun II, S. . . .	Sk.	6.6	9.1	10.6	17.0	19.0	21.0	27.0	28.5	31.2	11 18.89	− 0.20	. .	−24.14	0 10 54.55	. .
	32	Polaris	Sk.	31.0	20.0	22.5	15.0	46.0	11.0	40.0	5.5	. .	12 10.90	− 0.09	. .	−24.14	1 11 46.67	− 0.04
	33	β Arietis	Sk.	54.7	57.5	58.9	3.3	5.5	. .	. .	17.9	20.8	48 7.69	− 0.19	−24.27	−24.17	1 47 43.33	+ 0.12
	34	α Arietis	Sk.	17.8	20.6	22.3	29.0	31.0	33.2	40.0	41.7	44.4	0 31.11	− 0.19	−24.15	−24.17	2 0 6.75	− 0.01
25	35	Sun I, S. . . .	F.	15.9	18.4	20.0	26.1	28.0	30.1	36.4	37.8	40.5	16 28.13	− 0.33	. .	−26.22	0 16 1.58	. .
	36	Sun II, N. . . .	F.	24.7	27.4	29.0	35.0	37.0	39.0	45.3	46.8	49.5	18 37.08	− 0.33	. .	−26.22	0 18 10.53	. .
	37	Polaris	F.	. .	. .	16.0	42.0	10.0	36.0	1.0	. .	. .	12 9.00	+ 2.99	. .	−26.25	1 11 45.74	− 0.72
	38	η Piscium . .	F.	0.8	3.4	5.0	11.3	13.4	15.5	21.8	23.4	26.0	25 13.40	− 0.31	−26.30	−26.25	1 24 46.84	+ 0.12
	39	β Arietis	F.	59.4	1.0	5.5	7.6	9.7	11.9	14.2	18.6	20.1	48 9.78	− 0.30	−26.26	−26.27	1 47 43.21	+ 0.01
	40	α Arietis	F.	20.0	23.0	24.5	31.0	33.3	35.4	42.2	43.7	46.7	0 33.31	− 0.30	−26.24	−26.28	2 0 6.73	− 0.03
27	41	Sun I, N. . . .	Sk.	33.7	36.3	37.8	44.0	46.0	48.0	54.2	55.7	58.2	23 45.99	− 0.21	. .	−27.97	0 23 17.81	. .
	42	Sun II, S. . . .	Sk.	42.6	45.0	46.5	52.7	55.0	56.8	3.0	4.4	7.0	25 54.78	− 0.21	. .	−27.97	0 25 26.60	. .
	43	Polaris	Sk.	39.0	26.0	32.0	. .	. .	. .	. .	. .	. .	12 17.17	− 1.79	. .	−27.88	1 11 47.50	+ 1.19
	44	α Arietis	Sk.	21.6	24.6	26.1	32.8	35.0	37.2	43.8	45.5	48.3	0 34.99	− 0.24	−27.99	−27.89	2 0 6.86	+ 0.11
	45	α Ceti.	Sk.	0.1	2.8	4.1	10.3	12.3	14.4	20.6	22.2	24.7	56 12.39	− 0.21	−28.03	−27.91	2 55 44.27	+ 0.12
	46	Moon II, S. . .	Sk.	23.8	26.5	28.5	35.6	38.0	40.4	47.5	49.2	52.1	5 37.96	− 0.24	. .	−28.29	17 5 9.43	−69.55
	47	α^1 Herculis . . .	Sk.	13.6	16.2	17.8	24.1	26.2	28.4	34.6	36.2	38.9	9 26.22	− 0.35	−28.13	−28.29	17 8 57.58	− 0.14
	48	ars I, N. . .	Sk.	38.8	41.4	43.2	. .	. .	. .	1.0	2.8	5.6	24 52.13	− 0.26	. .	−28.30	17 24 23.57	+ 0.45
	49	Mars II, S. . .	Sk.	. .	. .	48.8	50.9	53.0	55.3	57.5	. .	. .	24 53.10	− 0.26	. .	−28.30	17 24 24.54	− 0.53
	50	μ Herculis . . .	Sk.	49.5	52.3	54.0	0.8	3.2	5.5	12.4	14.1	17.0	42 3.20	− 0.38	−28.17	−28.31	17 41 34.51	− 0.14

46. Bisections at wires III–V.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	3 52	10 19.6	18.1	7.3	0.0	33	. .	780	. .	795	. .	41.6	3 56 7.5	. .	+ 3.9	55 2 32.6	+ 1.6
2	310 12	19.8	18.3	8.2	3.0	34	130	. .	070	. .	095	41.6	310 16 1.7	. .	− 1 6.8	1 21 16.1	+ 1.9
3	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
4	22 28	20.5	19.0	6.3	0.9	31	. .	950	. .	945	. .	42.7	22 32 36.3	. .	+ 24.0	73 39 21.5	+ 6.0
5	25 30	22.0	19.8	8.4	4.0	37	. .	780	. .	860	. .	42.7	25 33 4.4	47.5	+ 27.6	76 39 53.2	+ 4.8
6	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
7	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
8	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
9	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
10	13 8	18.6	15.8	5.5	29.0	33	060	970	950	880	780	42.7	13 12 23.3	. .	+ 13.7	69 18 58.2	. .
11	40 24	19.0	15.8	4.2	1.8	37	680	686	. .	. .	. .	41.3	40 27 7.5	. .	+ 50.6	91 34 19.3	. .
12	39 52	21.2	16.2	6.1	3.0	38	. .	. .	. .	240	300	41.3	39 54 58.8	37.2	+ 49.6	91 2 9.6	. .
13	310 12	18.2	15.1	2.4	3.2	33	. .	990	984	992	. .	41.3	310 16 5.7	. .	− 1 10.5	1 21 16.4	+ 1.9
14	18 38	8.7	7.0	27.6	24.5	36	718	724	. .	. .	. .	41.3	18 41 31.2	. .	+ 20.3	69 48 12.7	+ 1.4
15	15 58	15.1	12.4	4.3	29.9	37	. .	. .	. .	978	986	41.3	16 1 6.6	33.3	+ 17.2	67 7 45.0	+ 1.9
16	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
17	72 40	11.8	6.1	23.0	27.3	34	. .	950	. .	950	. .	42.3	72 43 59.2	. .	+ 3 15.7	123 53 36.1	− 8.4
18	6 40	15.2	11.9	1.0	29.8	35	. .	582	. .	584	. .	42.3	6 43 45.0	. .	+ 7.3	57 50 13.5	+ 1.3
19	33 16	8.7	5 2	0.2	25.2	33	. .	. .	. .	656	676	42.3	33 20 19.2	. .	+ 40.5	84 27 20.9	− 1.3
20	10 30	11.2	8.9	27.0	28.2	35	. .	790	. .	800	. .	42.3	10 33 44.9	. .	+ 11.5	61 40 17.6	+ 0.8
21	307 46	15.8	12.4	3.8	2.6	32	678	688	692	690	690	42.3	307 50 27.2	24.0	− 1 19.1	358 55 29.3	+ 1.9
22	31 56	11.1	6.8	2.5	26.5	32	. .	990	. .	008	. .	42.3	32 0 27.2	. .	+ 38.5	83 7 26.9	+ 0.9
23	16 56	18.8	16.0	6.3	3.5	32	986	734	642	504	375	42.3	17 0 25.8	24.0	+ 18.8	68 7 5.8	. .
24	53 40	15.4	9.7	3.0	29.7	36	. .	668	. .	760	. .	41.3	53 43 26.3	. .	+ 1 23.6	104 51 11.1	. .
25	53 40	15.4	9.7	3.0	29.7	35	500	. .	. .	. .	624	41.3	53 43 43.9	29.2	+ 1 23.6	104 51 28.7	. .
26	29 30	12.8	9.4	3.1	27.2	30	. .	192	. .	240	. .	41.3	29 35 7.3	. .	+ 34.9	80 42 3.4	+ 1.1
27	39 44	11.5	6.7	1.6	26.8	32	. .	512	. .	570	. .	41.3	39 48 33.1	. .	+ 51.1	90 55 45.4	+ 0.9
28	9 16	12.6	8.5	0.2	28.8	36	. .	. .	. .	044	090	41.3	9 19 38.9	. .	+ 10.1	60 26 10.2	−11.8
29	24 18	14.0	9.4	3.6	28.0	36	. .	. .	. .	932	948	41.3	24 21 24.1	. .	+ 27.7	75 28 13.0	+ 3.8
30	37 28	5.3	0.9	24.2	21.0	31	488	522	. .	. .	. .	41.3	37 32 54.5	. .	+ 46.8	88 40 2.5	. .
31	38 0	4.5	28.8	22.4	21.5	30	. .	. .	. .	986	118	41.3	38 5 4.1	35.5	+ 47.6	89 12 12.9	. .
32	310 12	14.5	13.9	5.0	1.3	33	860	. .	887	. .	870	41.3	310 16 8.5	. .	− 1 11.3	1 21 18.4	+ 2.1
33	18 38	10.0	9.0	3.2	27.5	36	. .	. .	. .	400	450	41.3	18 41 33.4	. .	+ 20.4	69 48 15.0	+ 3.3
34	15 58	11.5	9.1	4.3	27.0	37	. .	990	. .	040	. .	41.3	16 1 8.1	40.4	+ 17.3	67 7 46.6	+ 3.1
35	37 14	14.0	7.5	0.2	23.9	35	382	358	. .	. .	. .	37.3	37 17 45.2	. .	+ 45.8	88 24 52.2	. .
36	36 42	8.3	29.7	22.6	18.2	36	. .	. .	. .	070	086	37.3	36 45 42.8	39.2	+ 44.9	87 52 48.9	. .
37	310 12	14.5	7.8	0.2	27.4	33	864	856	850	850	. .	37.3	310 16 8.3	40.6	− 1 10.6	1 21 18.9	+ 1.9
38	24 8	3.5	29.0	20.3	18.6	38	. .	. .	. .	122	130	37.3	24 11 12.9	. .	+ 26.9	75 18 1.0	+ 3.9
39	18 38	11.2	4.8	29.2	23.8	36	. .	310	. .	326	. .	37.3	18 41 33.3	. .	+ 20.2	69 48 14.7	+ 2.9
40	15 58	12.1	5.7	0.0	25.2	37	. .	916	. .	926	. .	37.3	16 1 7.8	41.8	+ 17.2	67 7 46.2	+ 2.5
41	35 54	5.3	29.0	21.3	17.4	31	885	890	. .	. .	. .	38.2	35 58 47.7	. .	+ 41.6	87 5 50.5	. .
42	36 26	12.3	7.7	28.8	23.5	31	. .	. .	. .	303	285	38.2	36 30 51.1	59.0	+ 42.5	87 37 54.8	. .
43	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
44	15 58	18.0	17.0	9.0	1.4	37	. .	304	. .	400	. .	38.2	16 1 9.4	. .	+ 16.4	67 7 47.0	+ 3.2
45	35 12	15.2	12.3	4.4	26.0	29	. .	970	. .	932	. .	38.2	35 17 7.0	63.4	+ 40.2	86 24 8.4	+ 2.2
46	67 20	20.8	14.5	4.7	3.5	39	333	. .	180	. .	063	40.6	67 22 43.9	. .	+ 2 24.3	118 31 29.4	. .
47	24 18	20.8	14.5	5.1	1.3	36	. .	119	. .	130	. .	40.6	24 21 31.5	35.2	+ 27.4	75 28 20.1	+ 3.2
48	61 44	17.5	11.0	2.2	28.5	31	. .	. .	. .	144	. .	40.6	61 48 50.8	. .	+ 1 52.6	112 57 4.6	. .
49	61 44	17.5	11.0	2.2	28.5	30	. .	. .	. .	. .	070	40.6	61 49 7.2	. .	+ 1 52 7	112 57 21.1	. .
50	11 2	22.3	17.0	7.5	3.5	33	. .	300	. .	358	. .	40.6	11 6 12.2	. .	+ 11.9	62 12 45.3	+ 3.7

No.	Barom.	At. Ther.
	in.	°
5	29.62	50.0
12	29.79	37.5
15	29.82	39.3
21	30.01	27.0
23	30.03	26.5
25	30.30	27.4
31	30.38	34.2
34	30.34	38.0
36	30.25	38.2
37	30.24	38.8
40	30.25	41.8
42	30.06	55.0
45	30.05	61.0
47	30.22	39.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
10	−12 54.5	+ 15 39.6	. .	+ 2 45.1
11	− 5.7	− 16 4.8	. .	− 16 10.5
12	− 5.6	+ 16 4.8	. .	+ 15 59.2
23	−16 25.3	+ 15 30.6	. .	− 0 54.7
24	− 7.6	+ 8.9	. .	+ 1.3
25	− 7.6	− 8.9	+ 0.2	− 16.3
30	− 5.4	+ 16 5.2	. .	+ 15 59.8
31	− 5.4	− 16 5.2	. .	− 16 10.6
35	− 5.4	− 16 1.6	. .	− 16 7.0
36	− 5.3	+ 16 1.6	. .	+ 15 56.3
41	− 5.2	+ 16 2.1	. .	+ 15 56.9
42	− 5.3	− 16 2.1	. .	− 16 7.4
46	−50 7.4	− 14 51.7	. .	− 1 4 59.1
48	− 8.1	+ 8.3	− 0.1	+ 0.1
49	− 8.1	− 8.3	. .	− 16.4

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Mar. 27	1	γ² Sagittarii	Sk.	1.9	4.8	6.4	13.7	16.0	18.5	25.6	27.3	30.3	58 16.06	− 0.23	−28.39	−28.32	17 57 47.51	+ 0.08
	2	δ Ursæ Minoris	Sk.	42.5	24.5	50.0	59.5	32.5	9.0	43.0	17.0	. .	13 8.28	− 2.63	. .	−28.33	18 12 37.32	− 0.74
	3	η Serpentis	Sk.	. .	. .	. .	. .	. .	23.7	27.8	29.4	32.0	15 19.65	− 0.31	−28.34	−28.33	18 14 51.01	+ 0.07
Apr. 4	4	Venus II, N.	E.	. .	. .	27.9	30.0	32.3	34.5	36.3	. .	. .	22 32.20	− 0.32	. .	−32.06	22 21 59.82	− 0.56
	5	B. A. C. 7923	E.	26.0	28.9	30.7	37.7	40.0	42.4	49.4	51.0	54.1	37 40.02	− 0.38	. .	−32.06	22 37 7.58	+ 1.06
	6	α Piscis Australis	E.	2.2	5.0	7.0	13.8	16.5	18.9	25.7	27.7	30.6	51 16.38	− 0.29	−32.04	−31.96	22 50 44.13	+ 0.12
	7	B. A. C. 8032	E.	. .	. .	9.8	12.0	14.2	16.7	19.0	. .	. .	58 14.34	− 0.37	. .	−32.06	22 57 41.91	+ 1.08
	8	Mercury II, C.	E.	59.8	2.5	4.0	10.0	12.2	14.2	20.3	21.9	24.5	23 12.16	− 0.33	. .	−32.06	23 32 39.78	− 0.23
	9	α Andromedæ	E.	13.0	15.9	17.8	24.6	27.0	29.1	36.3	37.9	41.0	2 26.96	− 0.37	−32.08	−31.99	0 1 54.60	+ 0.11
5	10	Sun I, S.	E.	23.4	25.9	27.4	33.5	35.6	37.7	43.8	45.3	47.8	56 35.60	− 0.35	. .	−32.06	0 56 3.20	. .
	11	Sun II, N.	E.	32.3	34.9	36.5	42.5	44.5	46.6	53.0	54.7	57.0	58 44.67	− 0.35	. .	−32.06	0 58 12.27	. .
	12	Polaris	E.	. .	. .	26.0	54.0	20.5	44.0	10.0	. .	. .	12 18.90	− 0.72	. .	−32.00	1 11 46.18	+ 0.93
	13	α Arietis	E.	25.8	28.5	30.3	37.0	39.2	41.4	48.0	49.6	52.5	0 39.14	− 0.37	−32.03	−32.02	2 0 6.75	+ 0.02
	14	α Persei	E.	36.7	40.5	42.9	52.2	55.2	58.5	7.9	10.4	14.3	15 55.40	− 0.38	. .	−32.04	3 15 22.98	+ 0.09
	15	δ Persei	E.	15.0	18.9	21.2	30.0	33.1	36.1	45.2	47.5	51.3	34 33.12	− 0.38	. .	−32.04	3 34 0.70	+ 0.19
	16	η Tauri	E.	21.7	24.5	26.2	32.8	35.0	37.3	44.0	45.6	48.5	40 35.07	− 0.36	−32.05	−32.05	3 40 2.66	0.00
	17	ζ Persei	E.	33.9	37.0	38.7	45.9	48.3	50.6	57.9	59.7	2.7	46 48.30	− 0.36	−32.08	−32.05	3 46 15.89	+ 0.02
	18	γ¹ Eridani	E.	31.2	33.9	35.4	41.6	43.8	46.0	52.2	53.8	56.5	52 43.82	− 0.31	−32.09	−32.05	3 52 11.46	+ 0.08
	19	B. A. C. 2720	E.	3.8	6.5	8.0	14.3	16.4	18.6	25.0	26.5	29.2	2 16.48	− 0.36	. .	−32.03	8 1 44.09	− 0.87
	20	B. A. C. 2772	E.	6.2	9.5	11.4	19.1	21.6	24.3	31.9	33.7	37.0	8 21.63	− 0.29	. . .	−32.03	8 7 49.31	− 0.49
	21	B. A. C. 2799	E.	32.8	35.5	37.1	43.5	45.7	47.9	54.4	56.0	58.7	16 45.73	− 0.37	. .	−32.03	8 16 13.33	− 1.01
	22	B. A. C. 2877	E.	5.0	8.5	10.5	18.4	20.7	23.4	31.3	33.0	36.4	27 20.80	− 0.28	.	−32.04	8 26 48.48	− 0.58
	23	B. A. C. 2901	E.	23.5	26.0	27.5	33.5	35.7	37.7	43.9	45.4	48.0	31 35.69	− 0.35	. .	−32.04	8 31 3.30	− 0.96
	24	ε Hydræ	E.	30.5	33.0	34.6	40.7	42.7	44.8	51.5	52.5	55.1	40 42.82	− 0.35	−32.11	−32.13	8 40 10.34	− 0.06
	25	B. A. C. 2984	E.	5.2	8.3	10.2	17.4	19.7	22.4	29.8	31.6	34.6	43 19.91	− 0.38	. .	−32.05	8 42 47.48	− 1.43
	26	B. A. C. 3030	E.	19.3	22.5	24.5	32.4	34.9	37.4	45.0	47.0	50.4	48 34.82	− 0.28	. .	−32.06	8 48 2.48	− 0.69
	27	B. A. C. 3081	E.	42.5	45.7	47.7	55.9	58.6	1.4	9.5	11.4	14.7	55 58.60	− 0.28	. .	−32.06	8 55 26.26	− 0.71
	28	B. A. C. 3105	E.	44.8	47.4	48.9	55.0	57.0	59.1	5.2	6.8	9.4	59 57.07	− 0.35	. .	−32.06	8 59 24.66	− 1.10
	29	B. A. C. 3112	E.	29.7	32.8	34.6	42.0	44.5	47.0	54.5	56.2	59.5	1 44.53	− 0.38	. .	−32.07	9 1 12.08	− 1.57
	30	B. A. C. 3146	E.	13.0	15.5	17.0	23.0	25.0	27.2	33.4	34.9	37.5	8 25.17	− 0.35	. .	−32.07	9 7 52.75	− 1.11
	31	B. A. C. 3178	E.	45.4	48.4	50.4	57.7	0.3	2.7	10.0	12.0	15.1	14 0.22	− 0.38	. .	−32.08	9 13 27.76	− 1.66
	32	α Hydræ	E.	47.9	50.5	52.0	58.0	0.1	2.3	8.6	10.0	12.7	22 0.23	− 0.34	−32.15	−32.15	9 21 27.74	− 0.03
	33	B. A. C. 3257	E.	4.2	7.5	9.4	17.3	19.9	22.6	30.8	32.6	36.0	26 20.03	− 0.28	. .	−32.08	9 25 47.67	− 0.88
	34	B. A. C. 3267	E.	42.2	44.4	49.6	52.1	54.7	57.6	0.3	5.7	7.5	27 54.90	− 0.28	. .	−32.09	9 27 22.53	− 0.88
	35	ε Leonis	E.	5.7	8.4	10.1	16.9	19.1	21.5	28.0	29.7	32.5	39 19.10	− 0.37	−31.99	−32.15	9 38 46.58	− 0.22
	36	μ Leonis	E.	59.5	2.2	4.0	10.8	13.1	15.5	22.1	23.9	26.8	46 13.10	− 0.37	−32.04	−32.15	9 45 40.58	− 0.12
	37	79 Draconis, S. P.	E.	29.8	20.7	15.9	54.4	47.4	40.0	19.0	13.6	5.0	51 47.31	− 0.36	. .	−32.15	21 51 14.90	+ 0.66
	38	B. A. C. 3423	E.	11.5	14.4	15.9	22.6	24.8	26.9	33.6	35.3	37.9	56 24.77	− 0.37	. .	−32.11	9 55 52.29	− 1.62
	39	B. A. C. 3469	E.	18.3	21.0	22.6	29.0	31.1	33.4	39.6	41.0	43.8	4 31.09	− 0.36	. .	−32.12	10 3 58.61	− 1.55
	40	B. A. C. 3511	E.	42.7	45.5	47.2	53.8	56.0	58.2	5.0	6.7	9.5	10 56.07	− 0.37	. .	−32.12	10 10 23.58	− 1.71
	41	B. A. C. 3572	E.	58.1	1.5	3.3	11.0	13.6	16.1	23.8	25.7	28.9	21 13 56	− 0.37	. .	−32.13	10 20 41.04	− 2.12
	42	B. A. C. 3600	E.	25.0	27.7	29.3	35.4	37.4	39.4	45.5	47.1	49.6	24 37.38	− 0.35	. .	−32.13	10 24 4.90	− 1.44
	43	B. A. C. 3625	E.	29.9	33.0	35.0	42.7	45.2	47.8	55.5	57.4	0.7	29 45.24	− 0.38	. .	−32.14	10 29 12.72	− 2.15
	44	Anonymous	E.	1.3	3.6	5.2	11.1	13.2	15.6	21.4	23.1	25.5	36 13.33	− 0.34	. .	−32.14	10 35 40.85	− 1.38
	45	Anonymous	E.	. .	. .	18.4	20.3	22.4	24.5	26.4	. .	. .	37 22.40	− 0.34	. .	−32.14	10 36 49.92	− 1.39
	46	Phocæa	E.	18.6	21.0	22.7	29.1	31.2	33.2	39.5	41.0	43.8	28 31.12	− 0.33	. .	−32.18	11 27 58.61	. .
	47	Lalande 22168	E.	11.6	14.5	16.1	23.3	25.6	27.9	34.9	36.6	39.5	37 25.56	− 0.38	. .	−32.19	11 36 52.99	− 2.12

46, 47. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MIRCOMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	69 12	10 21.8	14.2	5.0	2.6	32	. .	156	. .	238	. .	40.6	69 16 30.8	. .	+ 2 39.2	120 25 31.2	+ 0.6
2	312 14	17.4	12.6	3.4	0.4	31	. .	204	240	220	. .	40.6	312 18 48.4	. .	− 1 6.8	3 24 2.8	+ 2.1
3	41 44	17.7	11.3	3.4	29.3	31	. .	. .	. .	256	316	40.6	41 48 48.2	33.3	+ 54.3	92 56 3.7	+ 2.8
4	49 30	15.5	13.0	3.1	28.4	36	. .	. .	. .	650	735	38.9	49 33 24.5	55.3	+ 1 8.2	100 40 53.9	. .
5	9 16	14.2	11.5	1.6	26.2	35	. .	865	. .	920	. .	38.9	9 19 37.9	. .	+ 9.6	60 26 8.7	−13.0
6	69 4	10.2	5.5	26.0	22.8	33	. .	910	. .	980	. .	38.9	69 8 12.1	. .	+ 2 31.2	120 17 4.5	+ 0.9
7	11 26	14.1	11.3	1.5	25.8	36	. .	. .	. .	950	910	38.9	11 29 22.6	. .	+ 11.8	62 35 55.6	−11.2
8	45 20	12.7	7.8	29.0	24.0	34	. .	530	. .	685	. .	38.9	45 23 59.9	. .	+ 58.8	96 31 19.9	. .
9	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. . .	. . . .	. .
10	32 58	15.7	9.9	0.2	24.8	32	378	380	. .	. .	. .	38.9	33 2 31.5	. .	+ 37.5	84 9 30.2	. .
11	32 26	12.7	9.7	21.1	22.0	33	. .	. .	. .	668	692	38.9	32 30 32.3	59.5	+ 36.8	83 37 30.3	. .
12	310 12	14.8	12.1	1.1	27.0	33	860	. .	855	. .	910	38.9	310 16 8.5	. .	− 1 8.0	1 21 21.7	+ 1.4
13	15 58	15.7	12.7	3.0	26.0	37	. .	655	. .	685	. .	38.9	16 1 9.6	. .	+ 16.5	67 7 47.3	+ 2.9
14	349 24	14.0	11.6	1.2	27.1	31	. .	320	. .	330	. .	38.9	349 28 47.9	. .	− 10.6	40 34 58.5	+ 0.8
15	351 26	14.6	11.8	2.5	25.9	32	. .	560	. .	570	. .	38.9	351 30 28.7	. .	− 8.6	42 36 41.3	+ 1.4
16	15 6	14.8	13.3	4.2	27.9	33	. .	090	. .	110	. .	38.9	15 10 18.9	. .	+ 15.5	66 16 55.6	+ 3.3
17	7 18	12.0	10.6	1.8	25.2	31	. .	440	. .	490	. .	38.9	7 22 46.7	. .	+ 7.4	58 29 15.3	+ 2.0
18	52 40	14.5	11.3	2.8	26.0	32	. .	855	. .	930	. .	38.9	52 44 23.3	. .	+ 1 15.1	103 51 59.6	+ 3.7
19	24 50	19.1	14.0	3.8	29.6	38	. .	160	. .	215	. .	36.9	24 52 57.4	. .	+ 27.1	75 59 45.7	+ 3.2
20	75 22	24.2	16.0	4.0	1.0	29	. .	805	. .	840	. .	36.9	75 27 3.0	. .	+ 3 41.0	126 37 5.2	−11.0
21	20 6	17.5	13.1	2.2	27.1	36	. .	930	. .	975	. .	36.9	20 9 18.0	54.0	+ 21.4	71 16 0.6	+ 4.3
22	77 24	9.8	8.6	26.0	24.5	33	. .	800	. .	880	. .	36.9	77 28 10.6	. .	+ 4 16.8	128 38 48.6	−11 7
23	32 40	14.0	8.2	2.7	28.2	31	. .	220	. .	270	. .	36.9	32 44 47.0	. .	+ 37.6	83 51 45.8	− 0.5
24	31 56	17.7	10.3	0.8	27.7	32	. .	350	. .	415	. .	36.9	32 0 28.8	. .	+ 36.5	83 7 26.5	+ 0.7
25	5 4	15.2	11.1	0.7	26.5	32	. .	870	. .	890	. .	36.9	5 8 22.1	. .	+ 5.3	56 14 48.6	+ 8.1
26	77 0	20.5	14.4	2.7	29.5	30	. .	500	. .	620	. .	36.9	77 4 53.7	. .	+ 4 9.6	128 15 24.5	−11.9
27	79 32	16.2	11.3	29.2	25.3	38	. .	910	. .	980	. .	36.9	79 34 49 1	. .	+ 5 7.7	130 46 18.0	−12.4
28	33 14	17.5	10.8	1.7	27.0	35	. .	850	. .	875	. .	36.9	33 17 35.4	. .	+ 38.4	84 24 35.0	− 1.8
29	4 26	19.2	15.5	4.0	29.0	33	. .	810	. .	820	. .	36.9	4 30 4.2	. .	+ 4.6	55 36 30.0	+ 7.3
30	35 58	14.5	8.5	29.0	23.5	32	. .	200	. .	235	. .	36.9	36 2 33.7	. .	+ 42.6	87 9 37.5	− 2.9
31	3 54	18.2	9.1	3.8	29.3	33	. .	020	. .	065	. .	36.9	3 58 17.9	. .	+ 4.1	55 4 43.2	+ 6.7
32	46 56	14.0	9.2	29.2	24.7	35	. .	225	. .	285	. .	36.9	46 59 47.1	. .	+ 1 2.7	98 7 11.0	+ 1.1
33	78 40	18.5	11.7	28.8	26.3	32	. .	815	. .	885	. .	36.9	78 44 21.6	. .	+ 4 46.0	129 55 28.8	−12.6
34	78 50	19.8	13.9	1.1	29.0	30	. .	. .	. .	735	735	36.9	78 54 51.7	. .	+ 4 50.2	130 6 3.1	−12.7
35	14 28	14.3	9.8	0.6	25.8	32	. .	720	. .	750	. .	36.9	14 32 24.9	. .	+ 15.2	65 39 1.3	− 0.6
36	12 14	17.0	12.0	2.6	26.5	35	. .	415	. .	430	. .	36.9	12 17 42.0	. .	+ 12.8	63 24 16.0	− 0.7
37	291 58	13.7	9.2	28.7	26.3	32	. .	840	. .	830	. .	36.9	292 2 22.9	. .	− 2 23.7	343 6 20.4	− 0.4
38	16 16	17.8	13.4	3.0	28.2	33	. .	055	. .	030	. .	36.9	16 20 16.8	. .	+ 17.2	67 26 55.2	+ 0.3
39	22 30	20.6	16.1	4.8	29.8	33	. .	780	. .	830	. .	36.9	22 34 3.4	. .	+ 24.4	73 40 49.0	− 1.9
40	15 6	18.3	11.3	1.1	26.5	36	. .	530	. .	560	. .	36.9	15 9 24.9	. .	+ 15.9	66 16 2.0	− 0.3
41	1 28	15.5	10.8	1.2	25.5	31	. .	420	. .	485	. .	36.9	1 32 44.1	. .	+ 1.6	52 39 6.9	+ 2.6
42	36 2	18.3	12.4	2.8	28.5	35	. .	965	. .	975	. .	36.9	36 5 32.4	. .	+ 42.8	87 12 36.4	− 6.2
43	1 52	16.8	13.5	2.4	28.0	37	. .	695	. .	745	. .	36.9	1 55 6.2	. .	+ 2.0	53 1 29.4	+ 1.8
44	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
45	45 12	16.0	10.5	1.0	26.5	38	. .	. .	. .	920	900	36.9	45 14 49.7	. .	+ 59.2	96 22 10.1	− 8.6
46	54 2	16.0	13.1	3.2	28.2	37	. .	350	. .	365	. .	39.7	54 7 47.2	. .	+ 1 21.2	105 15 29.6	− 4.4
47	10 2	18.9	15.1	4.9	29.5	33	. .	600	. .	620	. .	39.7	10 8 42.8	. .	+ 10.5	61 15 14.5	− 5.4

No.	Barom.	At. Ther.
	in.	°
3	30.23	37.5
4	30.27	53.0
11	30.27	58.0
21	30.30	57.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
4	− 6.5	+ 8.3	. .	+ 1.8
8	− 6.3	. .	0.0	− 6.3
10	− 4.8	− 15 59.9	. .	− 16 4.7
11	− 4.7	+ 15 59.9	. .	+ 15 55.2

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	CORRECTIONS. Inst.	Clock appar'nt.	Clock adopted.	Apparent Right Ascension.	Miscellan'us Corrections.
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Apr. 5	1	Lalande 22335. .	E.	3.4	6.3	8.0	15.0	17.3	19.6	26.7	28.4	31.4	43 17.34	− 0.38	. .	−32.19	11 42 44.77	− 2.14
	2	Lalande 22349. .	E.	36.1	39.0	40.9	47.8	50.1	52.4	59.5	1.2	4.3	44 50.14	− 0.38	. .	−32.19	11 44 17.57	− 2.14
	3	Weisse (2) 1028 .	E.	53.6	56.6	58.4	5.3	7.6	9.9	16.9	18.6	21.5	54 7.60	− 0.38	. .	−32.20	11 53 35.02	− 2.16
	4	η Virginis . . .	E.	52.8	55.3	56.7	2.9	5.0	7.0	13.0	14.6	17.1	14 4.93	− 0.35	−32.24	−32.20	12 3 32.38	+ 0.02
	5	Calypso . . .	E.	1.0	4.0	5.6	11.5	13.6	15.6	21.8	23.6	25.9	24 13.62	− 0.35	. .	−32.22	12 23 41.05	. .
	6	β Corvi	E.	10.2	13.0	14.6	21.3	23.5	25.7	32.4	34.0	36.8	28 23.51	− 0.32	−32.25	−32.21	12 27 50.98	0.00
	7	21 Cassiopeæ, S. P. .	E.	37.2	28.2	22.2	0.0	52.4	44.9	22.6	16.7	6.9	37 52.34	− 0.35	. .	−32.21	0 37 19.78	+ 0.42
	8	B. A. C. 4321 . .	E.	49.4	52.9	54.8	2.5	5.1	7.8	15.9	17.8	21.5	47 5.30	− 0.28	. .	−32.24	12 46 32.80	− 1.62
	9	12 Canum Venat. .	E.	30.0	33.3	35.3	43.1	45.7	48.4	56.3	58.2	1.7	50 45.78	− 0.39	−32.19	−32.21	12 50 13.18	− 0.02
	10	B. A. C. 4374 . .	E.	4.3	7.6	9.5	17.6	20.3	23.0	31.2	33.0	36.6	58 20.34	− 0.28	. .	−32.24	12 57 47.82	− 1.65
	11	Lacaille 5410 . .	E.	25.6	28.5	30.6	37.6	40.2	42.6	49.9	51.9	54.8	2 40.19	− 0.30	. .	−32.25	13 2 7.64	− 1.61
	12	Polaris, S. P. . .	E.	. .	. .	12.0	46.0	19.0	52.0	24.0	. .	. .	12 18.60	+ 0.20	. .	−32.22	1 11 46.58	+ 1.30
	13	Alcmene . . .	E.	. .	. .	36.0	38.2	40.0	42.4	44.3	. .	. .	20 40.18	− 0.34	. .	−32.26	13 20 7.58	. .
	14	B. A. C. 4518 . .	E.	2.8	6.3	8.3	16.0	18.7	21.5	29.5	31.4	34.6	26 18.79	− 0.28	. .	−32.27	13 25 46.24	− 1.68
	15	B. A. C. 4522 . .	E.	49.5	52.9	54.7	2.6	5.3	8.0	15.9	17.8	21.1	27 5.31	− 0.28	. .	−32.27	13 26 32.76	− 1.68
	16	Flora	E.	. .	. .	7.8	9.8	11.9	13.8	15.9	. .	. .	30 11.84	− 0.35	. .	−32.27	13 29 39.22	. .
7	17	Sun I, S. . . .	F.	42.2	44.9	46.4	52.6	54.6	56.7	2.9	4.5	7.1	3 54.66	− 0.37	. .	−32.83	1 3 21.46	. .
	18	Sun II, N. . . .	F.	51.7	54.2	55.9	2.0	4.0	6.1	12.3	13.7	16.4	6 4.03	− 0.37	. .	−32.83	1 5 30.83	. .
	19	Polaris	F.	. .	. .	25.0	51.0	18.0	42.0	8.0	. .	. .	12 16.80	+ 2.99	. .	−32.83	1 11 46.96	+ 1.55
	20	μ Leonis	F.	0.4	3.1	4.8	11.7	14.0	16.3	23.1	24.9	27.8	46 14.01	− 0.38	−32.97	−32.95	9 45 40.68	+ 0.01
	21	B. A. C. 3398 . .	F.	13.1	14.7	18.9	21.0	22.9	25.0	27.2	31.3	32.8	50 22.99	− 0.39	. .	−32.99	9 49 49.61	− 1.37
	22	B. A. C. 3423 . .	F.	12.2	15.0	17.0	21.0	25.5	30.0	34.3	36.0	38.8	56 25.53	− 0.39	. .	−32.99	9 55 52.15	− 1.60
	23	B. A. C. 3453 . .	F.	53.0	55.6	57.3	3.6	5.7	7.9	14.4	15.9	18.6	1 5.78	− 0.39	. .	−32.99	10 0 32.40	− 1.53
	24	B. A. C. 3469 . .	F.	19.2	22.0	23.6	29.8	31.9	34.0	40.5	42.1	44.9	4 32.00	− 0.39	. .	−32.99	10 3 58.62	− 1.53
	25	B. A. C. 3511 . .	F.	43.4	46.2	47.8	54.5	56.8	59.0	5.7	7.4	10.2	10 56.78	− 0.38	. .	−32.99	10 10 23.41	− 1.70
	26	γ¹ Leonis	F.	. .	. .	35.3	37.5	39.8	41.9	44.2	. .	. .	13 39.74	− 0.30	−33.01	−32.96	10 13 6.39	+ 0.03
	27	B. A. C. 3600 . .	F.	26.0	28.6	30.0	36.3	38.3	40.3	46.6	48.0	50.6	24 38.30	− 0.4	. .	−32.99	10 24 4.91	− 1.42
	28	ρ Leonis	F.	36.0	38.7	40.2	46.5	48.5	50.5	56.9	58.2	0.9	26 48.49	− 0.39	−32.89	−32.96	10 26 15.14	− 0.14
	29	Anonymous . .	F.	21.2	23.6	25.3	31.4	33.5	35.7	41.9	43.4	46.0	37 33.56	− 0.40	. .	−32.99	10 37 0.17	− 1.35
	30	δ Leonis	F.	49.6	52.2	53.9	58.4	2.8	7.0	11.5	13.0	15.9	8 2.70	− 0.39	−32.94	−32.97	11 7 29.34	− 0.09
	31	δ Crateris . . .	F.	27.7	30.4	32.0	38.2	40.3	42.5	48.9	50.4	53.0	13 40.38	− 0.40	−33.02	−32.98	11 13 7.00	+ 0.02
	32	τ Leonis	F.	53.2	55.8	57.4	1.5	3.5	5.6	13.7	15.2	17.7	22 5.53	− 0.40	−32.97	−32.98	11 21 32.15	− 0.03
	33	Phocæa . . .	F.	54.0	56.4	58.0	2.0	4.3	6.7	8.8	. .	19.1	27 6.50	− 0.40	. .	−32.99	11 26 33.11	. .
	34	B. A. C. 3973 . .	F.	22.8	24.8	30.4	33.0	35.8	38.6	41.3	47.0	48.9	37 35.84	− 0.37	. .	−32.99	11 37 2.48	− 2.59
	35	B. A. C. 4124 . .	F.	45.0	47.6	49.2	55.6	57.6	59.9	6.3	7.8	10.6	9 57.73	− 0.40	. .	−32.98	12 9 24.35	− 1.55
	36	η Virginis . . .	F.	53.4	56.0	57.5	3.7	5.7	7.8	13.9	15.4	18.0	14 5.71	− 0.40	−32.96	−32.99	12 13 32.32	− 0.05
	37	B. A. C. 4184 . .	F.	22.4	24.2	28.7	30.9	33.2	35.6	37.6	42.2	43.9	19 33.19	− 0.38	. .	−32.98	12 18 59.83	− 2.09
	38	β Corvi	F.	11.2	14.0	15.6	22.2	24.4	26.7	33.3	34.9	37.7	28 24.44	− 0.41	−33.08	−32.99	12 27 51.04	+ 0.05
	39	B. A. C. 4315 . .	F.	58.1	1.0	2.9	9.6	12.1	14.5	21.2	23.0	25.9	46 12.03	− 0.38	. .	−32.98	12 45 38.67	− 2.19
	40	12 Canum Venat. .	F.	. .	. .	. .	46.6	49.1	51.8	57.0	58.9	2.3	50 46.50	− 0.38	−32.91	−33.00	12 50 13.12	− 0.09
	41	Polaris, S. P. . .	F.	. .	. .	16.0	50.0	24.0	56.0	28.0	. .	. .	12 22.80	− 2.70	. .	−33.00	1 11 47.10	+ 1.61
	42	α Virginis . . .	F.	59.2	1.8	3.4	9.6	11.8	13.9	20.0	21.5	24.2	19 11.71	− 0.40	−33.07	−33.01	13 18 38.30	+ 0.04
	43	Flora	F.	3.0	5.4	6.9	13.1	15.2	17.3	23.3	24.9	27.4	28 15.17	− 0.40	. .	−32.98	13 27 41.79	. .
8	44	B. A. C. 3238 . .	Sk.	29.9	33.0	34.9	42.3	44.7	47.1	54.7	56.5	59.7	23 44.76	− 0.35	. .	−33.09	9 23 11.32	− 1.66
	45	B. A. C. 3250 . .	Sk.	34.7	37.3	39.0	45.0	47.2	49.3	55.6	57.0	59.6	25 47.19	− 0.40	. .	−33.09	9 25 13.70	− 1.27
	46	ε Leonis	Sk.	6.7	9.5	11.2	17.9	20.0	22.3	29.1	30.8	33.6	39 20.12	− 0.37	−33.05	−33.10	9 38 46.65	− 0.11
	47	B. A. C. 3403 . .	Sk.	4.0	7.1	8.8	16.2	18.5	20.9	28.0	29.8	32.8	51 18.46	− 0.46	. .	−33.10	9 50 44.90	− 1.00
	48	B. A. C. 3417 . .	Sk.	50.0	53.3	55.2	2.7	5.0	7.7	15.3	17.0	20.3	54 5.17	− 0.47	. .	−33.10	9 53 31.60	− 0.99
	49	α Leonis	Sk.	5.2	7.9	9.5	15.6	17.8	19.9	26.2	27.8	30.4	2 17.82	− 0.40	−33.16	−33.10	10 1 44.32	+ 0.02

5, 13, 16, 33, 43. Wire A used.
6. Wire B used.
24. Telescope micrometer reading increased one revolution in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	10 2	10 18.9	15.1	4.9	29.5	39	635	670	. .	. .	. .	39.7	10 4 37.2	. .	+ 10.5	61 11 8.9	− 5.8
2	10 2	18.9	15.1	4.9	29.5	33	835	835	. .	. .	. .	39.7	10 6 6.3	. .	+ 10.5	61 12 38.0	− 5.9
3	10 2	18.9	15.1	4.9	29.5	39	900	935	. .	. .	. .	39.7	10 4 33.2	. .	+ 10.5	61 11 4.9	− 6.6
4	38 48	14.0	8.2	29.0	23.4	36	950	005	. .	. .	. .	39.7	38 51 23.8	. .	+ 47.5	89 58 32.5	+ 2.7
5	35 0	19.3	13.3	5.5	28.5	36	. .	080	. .	120	. .	39.7	35 6 5.0	. .	+ 41.5	86 13 7.7	− 3.2
6	61 32	19.4	13.8	4.9	0.3	30	. .	555	. .	570	. .	39.7	61 34 23.4	. .	+ 1 48.6	112 42 33.2	+ 3.5
7	293 10	25.4	20.7	8.2	4.5	32	. .	985	. .	060	. .	39.7	293 14 12.5	. .	− 2 16.7	344 18 17.0	+ 3.4
8	78 16	18.5	11.9	0.5	27.1	37	. .	695	. .	760	. .	39.7	78 19 9.0	. .	+ 4 38.4	129 30 8.6	. .
9	359 50	13.4	10.0	1.6	26.0	33	. .	745	. .	800	. .	39.7	359 54 11.9	. .	− 0.1	51 0 33.0	+ 1.4
10	79 16	16.0	10.7	28.8	25.5	33	. .	350	. .	540	. .	39.7	79 20 16.4	. .	+ 5 4.2	130 31 41.8	−11.8
11	71 36	15.0	10.2	29.6	26.1	30	. .	785	. .	800	. .	39.7	71 40 57.1	. .	+ 2 56.6	122 50 14.9	−12.2
12	307 30	15.5	13.0	1.0	27.8	35	885	. .	920	. .	925	39.7	307 33 37.1	. .	− 1 16.7	358 38 41.6	+ 2.0
13	46 30	17.2	13.9	4.0	28.5	30	. .	560	. .	550	. .	39.7	46 37 30.6	48.0	+ 1 2.5	97 44 54.3	. .
14	78 4	16.1	11.2	29.4	26.0	30	. .	750	. .	820	. .	39.7	78 8 56.7	. .	+ 4 34.9	129 19 52.8	−11.4
15	78 4	16.1	11.2	29.4	26.0	36	. .	430	. .	620	. .	39.7	78 7 28.8	. .	+ 4 34.4	129 18 24.4	−11.3
16	37 44	20.6	15.7	5.4	0.4	34	. .	. .	. .	365	405	38.5	37 50 28.9	. .	+ 45.9	88 57 36.0	− 3.5
17	32 14	19.0	14.8	4.3	28.3	37	332	342	. .	. .	. .	38.5	32 17 11.2	56.0	+ 36.7	83 24 9.1	. .
18	31 42	19.0	16.1	5.2	29.5	37	322	348	. .	. .	. .	38.5	31 45 12.0	. .	+ 36.0	82 52 9.2	. .
19	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
20	12 14	10.9	4.6	24.9	21.1	35	. .	910	. .	904	. .	40.2	12 17 44.4	. .	+ 13.0	63 24 18.6	+ 2.1
21	29 18	11.3	4.4	25.2	21.5	36	. .	055	. .	055	. .	40.2	29 21 41.8	44.4	+ 33.6	80 28 36.6	− 2.8
22	16 16	16.5	4.3	2.5	26.7	33	. .	268	. .	276	. .	40.2	16 20 18.4	. .	+ 17.5	67 26 57.1	+ 0.5
23	21 26	19.5	13.7	4.9	29.2	30	232	240	. .	. .	. .	40.2	21 31 2.0	. .	+ 23.5	72 37 46.7	− 1.2
24	22 30	14.0	7.4	27.5	23.2	34	406	394	. .	. .	. .	40.2	22 34 4.5	. .	+ 24.8	73 40 50.5	− 1.7
25	15 16	14.1	7.8	28.8	24.2	36	752	764	. .	. .	. .	40.2	15 9 27.8	. .	+ 16.2	66 16 5.2	− 0.1
26	18 20	16.6	10.7	1.7	25.6	30	. .	722	. .	714	. .	40.2	18 24 58.1	. .	+ 19.9	69 31 39.2	+ 2.1
27	36 2	16.8	8.4	29.4	24.6	36	. .	262	. .	. .	. .	40.2	36 5 34.2	. .	+ 43.6	87 12 39.0	− 6.2
28	28 52	12.6	5.0	26.0	22.5	33	. .	826	. .	828	. .	40.2	28 56 15.0	. .	+ 33.0	80 3 9.2	+ 2.0
29	47 14	11.5	4.5	23.8	20.7	33	. .	604	. .	616	. .	40.2	47 18 19.7	. .	+ 1 4.8	98 25 45.7	− 9.1
30	17 36	14.2	7.9	29.1	23.6	31	. .	. .	. .	010	016	40.2	17 40 56.4	. .	+ 19.1	68 47 36.7	+ 2.7
31	52 56	9.9	3.0	23.8	19.8	40	. .	. .	. .	204	124	40.2	52 58 40.6	. .	+ 1 19.3	104 6 21.1	+ 2.3
32	35 16	10.5	2.8	24.7	21.2	33	208	214	. .	. .	. .	40.2	35 20 25.8	. .	+ 42.5	86 27 29.5	+ 1.4
33	53 34	10.1	3.7	22.1	19.7	39	. .	986	. .	986	. .	40.2	53 39 16.1	42.3	+ 1 21.3	104 46 58.6	− 4.4
34	356 24	0.0	25.1	13.0	9.3	32	. .	416	. .	430	. .	40.2	356 28 49.0	. .	− 3.7	47 35 6.5	− 2.5
35	55 40	14.7	6.5	29.3	24.5	37	. .	566	. .	578	. .	40.2	55 43 15.3	. .	+ 1 27.7	106 31 4.2	−12.4
36	38 48	19.0	9.0	1.5	26.3	36	. .	956	. .	962	. .	40.2	38 51 22.1	. .	+ 48.3	89 58 31.6	+ 1.8
37	14 12	17.9	12.2	3.3	28.1	33	. .	. .	. .	042	050	40.2	14 16 21.2	. .	+ 15.2	65 22 57.6	− 8.9
38	61 30	16.2	7.5	29.2	25.2	33	. .	292	. .	304	. .	40.2	61 34 20.0	42.2	+ 1 50.3	112 42 31.5	+ 1.5
39	10 36	18.5	12.7	2.4	26.8	33	. .	. .	. .	028	034	40.2	10 40 21.7	. .	+ 11.1	61 46 54.0	−10.5
40	359 50	12.3	7.9	29.0	23.8	33	. .	. .	. .	946	954	40.2	359 54 12.1	. .	− 0.1	51 0 33.2	+ 2.0
41	307 30	9.1	4.1	22.5	22.1	36	308	310	304	296	276	40.2	307 33 39.0	. .	− 1 18.1	358 38 42.1	+ 3.2
42	49 18	11.0	5.1	24.9	21.5	29	. .	996	. .	000	. .	40.2	49 23 14.4	. .	+ 1 10.1	100 30 45.7	+ 3.5
43	37 32	16.2	7.8	29.5	25.2	37	. .	292	. .	308	. .	40.2	37 37 51.6	40.2	+ 46.4	88 44 59.2	− 3.5
44	4 38	16.3	10.9	0.7	27.0	37	370	350	. .	. .	. .	40.5	4 41 16.6	. .	+ 4.8	55 47 42.6	+ 6.2
45	26 58	15.6	9.8	9.1	25.2	34	. .	245	. .	318	. .	40.5	27 2 2.6	50.5	+ 29.8	78 8 53.6	− 0.9
46	14 28	15.3	12.3	3.0	27.1	32	. .	582	. .	644	. .	40.5	14 32 28.7	. .	+ 15.2	65 39 5.1	+ 3.4
47	69 18	14.1	7.3	28.0	23.2	37	595	650	. .	. .	. .	40.5	69 21 15.0	. .	+ 2 34.0	120 30 10.2	−12.0
48	74 4	18.1	13.1	2.3	28.4	33	. .	816	. .	842	. .	40.5	74 8 8.6	. .	+ 3 23.1	125 17 52.9	−12.8
49	26 14	24.8	19.5	8.4	3.0	31	. .	. .	. .	595	678	40.5	26 18 36.6	. .	+ 29.0	77 25 26.8	+ 3.7

No.	Barom.	At. Ther
	in.	°
14	30.32	50.0
17	30.26	54.0
21	30.37	48.5
33	30.39	46.5
38	30.37	45.0
43	30.38	44.0
45	30.08	53.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
17	− 4.7	− 15 59.9	. .	− 16 4.6
18	− 4.6	+ 15 59.9	. .	+ 15 55.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII	VIII	IX	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Apr. 8	1	γ¹ Leonis	Sk.	26.8	29.5	31.3	37.6	39.8	42.0	48.5	50.2	52.8	13 39.83	— 0.38	—33.12	—33.10	10 13 6.35	0.00
	2	B. A. C. 3600 . .	Sk.	26.3	28.7	30.4	30.5	38.6	40.6	46.7	48.1	50.9	24 38.53	— 0.41	. .	—33.10	10 24 5.02	— 1.41
	3	B. A. C. 3625 . .	Sk.	30.9	34.0	36.0	43.8	46.3	48.9	56.6	58.5	1.7	29 46.30	— 0.34	. .	—33.10	10 29 12.86	— 2.12
	4	Anonymous . .	Sk.	. .	. .	29.7	31.7	33.8	35.9	38.0	. .	. .	37 33.82	— 0.43	. .	—33.11	10 37 0.28	— 1.35
	5	B. A. C. 3822 . .	Sk.	. .	. .	23.3	25.7	28.1	30.4	32.8	. .	. .	4 28.06	— 0.46	. .	—33.12	11 3 54.48	— 1.31
	6	B. A. C. 3838 . .	Sk.	3.4	6.0	7.6	13.9	16.0	18.0	24.4	26.0	28.7	8 16.00	— 0.39	. .	—33.12	11 7 42.49	— 1.76
	7	B. A. C. 3890 . .	Sk.	46.0	49.1	51.1	58.5	1.0	3.6	11.2	13.0	16.3	20 1.09	— 0.46	. .	—33.12	11 19 27.51	— 1.36
	8	B. A. C. 4002 . .	Sk.	34.2	36.7	38.3	44.4	46.4	48.4	54.7	56.2	58.7	44 46.44	— 0.41	. .	—33.13	11 44 12.90	— 1.66
	9	B. A. C. 4046 . .	Sk.	30.4	33.4	35.3	42.7	45.1	47.6	55.0	57.0	0.1	53 45.18	— 0.46	. .	—33.14	11 53 11.58	— 1.47
	10	β Corvi	Sk.	11.5	14.3	15.9	22.6	24.8	27.1	33.9	35.5	38.2	28 24.87	— 0.45	—33.46	—33.15	12 27 51.27	+ 0.27
	11	Polaris, S. P. . .	Sk.	. .	. .	. .	. .	. .	. .	39.5	35.0	. .	12 24.84	— 6.16	. .	—33.16	1 11 45.52	— 0.14
13	12	α Pegasi	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	13	Venus II, N. . .	F.	. .	. .	. .	. .	. .	41.7	45.9	47.4	50.0	2 37.63	— 0.46	. .	—36.48	23 2 0.69	— 0.53
	14	Venus, S. . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	15	Polaris	F.	. .	. .	17.0	46.0	. .	40.0	8.0	. .	49.0	12 12.32	+ 9.78	. .	—36.41	1 11 45.69	— 0.72
14	16	δ Pérsei	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	17	η Tauri	F.	26.0	28.9	30.6	37.3	39.5	41.7	48.4	50.0	53.0	40 39.49	— 0.38	—36.51	—36.50	3 40 2.61	+ 0.01
	18	ζ Persei	F.	38.3	41.3	43.1	50.2	52.6	55.0	2.3	4.0	7.0	46 52.64	— 0.34	—36.51	—36.50	3 46 15.80	0.00
	19	γ¹ Eridani. . . .	F.	35.9	38.5	40.1	46.3	48.4	50.5	57.0	58.5	1.1	52 48.48	— 0.52	—36.62	—36.50	3 52 11.46	+ 0.14
	20	α Hydræ	F.	52.5	55.0	56.6	2.8	4.8	6.9	13.0	14.6	17.2	22 4.82	— 0.54	—36.65	—36.66	9 21 27.62	— 0.04
	21	B. A. C. 3295 . .	F.	22.0	24.6	26.1	32.3	34.3	36.4	42.5	44.0	46.6	32 34.31	— 0.50	. .	—36.63	9 31 57.18	— 1.15
	22	B. A. C. 3317 . .	F.	37.8	40.7	42.4	49.5	51.9	54.3	1.4	3.1	6.2	36 51.92	— 0.41	. .	—36.63	9 36 14.88	— 1.57
	23	Moon I, N. . .	F.	56.0	59.0	0.6	7.0	9.3	11.4	18.2	19.7	22.5	39 9.30	— 0.46	.	—36.63	9 38 32.21	+67.36
	24	B. A. C. 3398 . .	F.	14.4	17.0	18.5	24.6	26.8	29.0	35.1	36.6	39.1	50 26.79	— 0.49	. .	—36.63	9 49 49.67	— 1.29
	25	B. A. C. 3423 . .	F.	. .	. .	24.8	27.0	29.3	31.5	33.7	. .	. .	56 29.26	— 0.45	. .	—36.64	9 55 52.17	— 1.52
	26	B. A. C. 3453 . .	F.	56.7	59.4	1.0	7.4	9.5	11.6	18.0	19.7	22.3	1 9.51	— 0.46	. .	—36.64	10 0 32.41	— 1.46
	27	α Leonis	F	8.7	11.3	13.0	19.1	21.2	23.3	29.7	31.2	33.8	2 21.26	— 0.48	—36.58	—36.69	10 1 44.09	— 0.15
	28	32 Ursæ Majoris. .	F.	. .	. .	26.8	31.5	36.4	41.5	46.5	. .	. .	9 36.54	+ 0.01	. .	—36.69	10 8 59.86	+ 0.10
	29	γ¹ Leonis	F.	33.0	34.8	39.0	41.2	43.4	45.6	47.7	52.1	53.7	13 43.39	— 0.45	—36.67	—36.69	10 13 6.25	— 0.04
	30	B. A. C. 3572 . .	F.	2.8	5.9	7.8	15.3	18.0	20.6	28.4	30.2	33.4	21 18.04	— 0.38	. .	—36.64	10 20 41.02	— 2.01
	31	B. A. C. 3625 . .	F.	. .	. .	. .	49.8	52.5	55.0	0.1	2.0	5.2	29 49.86	— 0.38	. .	—36.64	10 29 12.84	— 2.05
	32	Anonymous . .	F.	5.5	8.1	9.6	15.6	17.8	20.0	25.8	27.6	30.0	36 17.78	— 0.54	. .	—36.64	10 35 40.60	— 1.3
	33	Anonymous . .	F.	14.5	17.0	18.6	24.8	26.8	29.0	34.9	36.5	39.0	37 26.79	— 0.54	. .	—36.64	10 36 49.61	— 1.32
	34	B. A. C. 3973 . .	F.	. .	. .	34.1	36.9	39.7	42.1	45.2	. .	. .	37 39.60	— 0.35	. .	—36.66	11 37 2.59	— 2.55
20	35	Sun I, N. . . .	Sk.	47.0	49.6	51.2	57.1	59.6	1.7	8.0	9.5	12.0	51 59.52	— 0.62	. .	—41.76	1 51 17.14	. .
	36	Sun II, S. . . .	Sk.	57.5	0.1	1.6	7.8	9.9	12.0	18.4	19.8	22.4	54 9.94	— 0.62	. .	—41.76	1 53 27.56	. .
	37	α Ceti	Sk.	. .	. .	22.4	24.5	26.5	28.5	30.7	. .	. .	56 26.52	— 0.68	—41.75	—41.80	2 55 44.04	— 0.03
	38	α Persei	Sk.	45.9	52.1	58.7	1.8	4.9	8.0	11.2	17.5	23.7	16 4.87	— 0.20	. .	—41.81	3 15 22.86	+ 0.05
	39	δ Persei	Sk.	24.6	28.3	30.4	39.6	42.7	45.7	54.8	56.9	0.7	34 42.63	— 0.24	. .	—41.82	3 31 0.57	+ 0.17
	40	η Tauri	Sk.	31.5	34.2	35.9	42.7	44.9	47.2	53.9	55.5	58.3	40 44.90	— 0.52	—41.80	—41.82	3 40 2.56	— 0.02
	41	ζ Persei	Sk.	43.8	46.7	48.6	55.7	58.0	0.5	7.7	9.5	12.6	46 58.12	— 0.44	—41.91	—41.83	3 46 15.85	+ 0.07
	42	ε Leonis	Sk.	15.7	18.5	20.2	26.8	29.0	31.3	38.0	39.6	42.5	39 29.07	— 0.55	—41.97	—42.05	9 38 46.47	— 0.14
	43	α Leonis	Sk.	14.4	16.9	18.5	24.8	26.8	29.0	35.3	36.8	39.3	2 26.87	— 0.65	—42.09	—42.07	10 1 44.15	— 0.02
	44	γ¹ Leonis	Sk.	35.9	38.5	40.2	46.7	49.0	51.0	57.5	59.2	1.9	13 48.88	— 0.58	—42.10	—42.08	10 13 6.22	0.00
	45	9 Draconis . . .	Sk.	20.2	31.1	37.5	. .	. .	. .	46.9	53.0	3.9	25 12.10	+ 1.02	. .	—42.09	10 24 31.03	— 0.23
	46	B. A. C. 3684 . .	Sk.	15.0	17.5	19.1	25.0	27.1	29.2	35.3	36.8	39.3	39 27.14	— 0.72	. .	—42.07	10 38 44.35	— 1.38
	47	ι Cephei, S. P. . .	Sk.	24.7	18.6	15.0	0.1	55.1	50.2	35.5	31.8	25.4	45 55.16	— 1.69	. .	—42.10	22 45 11.37	+ 0.16
	48	δ Leonis (R.) . .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . .	. . . . .	. .

15. III and IV have been increased 30ˢ each, and VI has been increased 10ˢ.
23. Bisections at wires II–VI.
28. Bisections at sets B and D.
30. Telescope micrometer reading decreased five revolutions in reduction.
32. Wire A used.
47. Bisections at set C.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	18 20	10 18.5	14.7	4.0	28.5	30	. .	400	. .	418	. .	40.5	18 25 0.4	. .	+ 19.5	69 31 41.1	+ 4.1
2	36 2	18.0	12.0	2.6	28.1	35	892	966	. .	. .	. .	40.5	36 5 37.0	47.9	+ 42.8	87 12 41.0	− 6.2
3	1 52	19.5	15.5	5.0	0.9	37	. .	574	. .	581	. .	40.5	1 55 9.5	. .	+ 2.0	53 1 32.7	+ 2.3
4	47 14	17.5	13.0	3.3	27.6	33	. .	. .	. .	130	146	40.5	47 18 19.8	. .	+ 1 3.5	98 25 44.5	− 9.1
5	70 28	15.0	11.1	1.2	27.6	32	380	480	. .	. .	. .	40.5	70 32 31.4	. .	+ 2 44.7	121 41 37.3	−13.0
6	22 42	22.6	18.0	7.1	1.3	31	. .	678	. .	730	. .	40.5	22 46 37.2	. .	+ 24.7	73 53 23.1	− 5.5
7	74 10	24.3	18.0	5.9	2.4	37	503	511	. .	. .	. .	40.5	74 13 7.2	. .	+ 3 25.0	125 22 53.4	−13.3
8	36 20	17.0	11.5	0.7	26.5	30	. .	618	. .	650	. .	40.5	36 25 59.4	. .	+ 43.4	87 32 4.0	− 9.8
9	73 24	16.4	10.1	0.2	26.2	36	. .	700	. .	802	. .	40.5	73 27 26.2	46.4	+ 3 15.5	124 37 2.9	−13.3
10	61 30	25.0	14.0	4.5	0.1	32	. .	. .	. .	642	654	40.5	61 34 24.1	. .	+ 1 48.3	112 42 33.6	+ 3.4
11	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
12	24 18	12.0	6.1	29.5	24.8	37	. .	. .	. .	072	076	37.8	24 21 21.7	. .	+ 26.4	75 28 9.3	+ 0.1
13	46 0	15.1	6.6	1.4	27.2	23	. .	. .	. .	618	. .	37.8	46 6 46.0	48.1	+ 59.2	97 14 6.4	. .
14	46 0	15.1	6.6	1.4	27.2	22	. .	. .	. .	. .	660	37.8	46 7 0.9	. .	+ 59.3	97 14 21.4	. .
15	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	53.0	. .	. . . .	. .
16	351 26	8.9	9.9	28.5	25.2	32	. .	646	. .	642	. .	37.8	351 30 29.4	. .	− 8.6	42 36 42.0	− 0.9
17	15 6	12.8	8.5	29.7	25.5	33	. .	292	. .	306	. .	37.8	15 10 18.2	. .	+ 15.5	66 16 54.9	+ 2.1
18	7 18	7.7	8.2	26.7	22.6	31	. .	620	. .	624	. .	37.8	7 22 46.8	. .	+ 7.4	58 29 15.4	+ 1.4
19	52 40	9.7	6.9	21.9	22.4	33	. .	. .	. .	286	294	37.8	52 44 22.3	. .	+ 1 15.3	103 51 58.8	+ 4.0
20	46 56	15.3	5.4	26.7	24.5	35	302	316	. .	332	336	38.8	46 59 49.2	. .	+ 1 2.8	98 7 13.2	+ 3.1
21	33 36	10.7	3.1	21.1	20.1	33	665	680	. .	. .	. .	38.8	33 40 18.5	. .	+ 39.1	84 47 18.8	− 3.1
22	8 16	15.4	10.6	29.3	27.0	32	212	222	. .	. .	. .	38.8	8 20 34.2	. .	+ 8.6	59 27 4.0	+ 4.8
23	20 12	20.2	13.2	2.4	29.5	31	028	866	702	562	410	38.8	20 16 54.0	45.5	+ 21.7	71 23 36.9	. .
24	29 18	14.7	7.2	26.3	24.5	35	. .	890	. .	896	. .	38.8	29 21 40.4	. .	+ 33.1	80 28 34.7	− 2.6
25	16 16	13.2	8.1	27.0	24.3	33	. .	. .	. .	550	556	38.8	16 20 16.8	. .	+ 17.2	67 26 55.2	+ 1.1
26	21 26	13.6	8.0	27.0	24.0	30	618	640	. .	. .	. .	38.8	21 31 0.8	. .	+ 23.2	72 37 45.2	− 0.8
27	26 14	13.6	7.0	24.0	22.0	32	. .	384	. .	392	. .	38.8	26 18 35.6	. .	+ 29.3	77 25 26.1	+ 3.3
28	333 6	11.5	4.1	21.8	21.9	34	. .	510	. .	496	. .	38.8	333 10 5.1	. .	− 29.8	24 15 56.5	− 1.2
29	18 20	17.4	10.2	29.8	26.1	30	. .	. .	. .	718	724	38.8	18 24 57.4	. .	+ 19.6	69 31 38.2	+ 1.7
30	1 28	12.1	5.3	23.9	22.8	31	808	798	. .	. .	. .	38.8	1 32 45.9	. .	+ 1.6	52 39 8.7	+ 3.9
31	1 52	13.6	7.6	26.7	24.7	38	. .	. .	. .	136	140	38.8	1 55 6.7	. .	+ 2.0	53 1 29.9	+ 3.2
32	45 12	13.5	4.7	23.4	22.3	33	002	014	. .	. .	. .	38.8	45 18 59.3	. .	+ 59.5	96 26 20.0	− 8.8
33	45 12	13.5	4.7	23.4	22.3	39	. .	. .	. .	358	380	38.8	45 14 49.6	. .	+ 59.4	96 22 10.2	− 8.9
34	356 24	17.2	10.2	29.4	26.0	31	. .	440	. .	448	. .	38.8	356 28 46.3	41.8	− 3.6	47 35 3.9	− 1.0
35	27 0	7.2	4.3	23.4	21.3	33	392	340	. .	. .	. .	36.1	27 4 19.8	. .	+ 29.6	78 11 10.6	. .
36	27 32	9.0	4.5	24.5	23.3	33	. .	. .	. .	830	878	36.1	27 36 12.6	50.5	+ 30.3	78 43 4.1	. .
37	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
38	349 24	14.5	13.5	4.3	0.6	30	. .	768	. .	770	. .	36.1	349 28 51.4	50.2	− 10.8	40 35 1.8	+ 1.5
39	351 26	13.5	11.5	3.0	27.0	32	. .	240	. .	252	. .	36.1	351 30 30.8	. .	− 8.6	42 36 43.4	+ 1.1
40	15 6	11.4	12.1	3.0	26.6	33	. .	280	. .	310	. .	36.1	15 10 15.0	51.5	+ 15.7	66 16 51.9	− 1.1
41	7 18	9.2	7.2	2.0	26.0	31	. .	. .	. .	506	490	36.1	7 22 45.2	. .	+ 7.5	58 29 13.9	− 0.6
42	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	41.3	. .	. . . .	. .
43	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
44	18 20	18.8	13.5	0.3	27.8	30	. .	496	. .	550	. .	39.0	18 24 58.4	. .	+ 19.7	69 31 39.3	+ 3.3
45	322 28	18.9	10.9	29.7	29.5	30	932	. .	. .	. .	956	39.0	322 32 52.2	. .	− 45.4	13 38 28.0	+ 2.2
46	35 40	19.8	12.8	28.4	29.0	32	. .	706	. .	810	. .	39.0	35 44 24.2	. .	+ 42.7	86 51 28.1	− 6.5
47	284 26	20.0	10.5	28.1	29.3	35	300	. .	. .	. .	335	39.0	284 29 45.5	. .	− 3 45.4	335 32 21.3	+ 2.0
48	162 16	10 17.3	9.3	28.8	27.2	37	910	929	998	988	972	39.0	162 19 6.2	39.1	− 19.0	68 47 34.0	+ 1.3

No.	Barom.	At. Ther.
	in.	°
2	30.08	52.0
9	30.07	51.0
13	29.925	45.5
15	29.93	51.0
18	29.93	51.0
23	29.96	50.0
34	29.97	47.5
36	29.86	46.0
40	29.86	51.0
42	29.91	44.0
48	29.93	42.0

For summary of the elements of reduction see page 3.

No.	Parallax	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
13	− 5.8	+ 7.8	. .	+ 2.0
14	− 5.8	− 7.8	+ 0.6	− 13.0
23	−19 22.1	+ 15 24.4	. .	− 3 57.7
35	− 4.0	+ 15 56.7	. .	+ 15 52.7
36	− 4.1	− 15 56.7	. .	− 16 0.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Apr. 20	1	λ Draconis	Sk.	8.4	16.2	20.5	38.3	44.6	50.6	8.6	12.8	20.3	24 44.48	+ 0.43	. .	−42.12	11 24 2.79	+ 0.12
	2	γ Cephei, S. P.	Sk.	46.4	35.3	28.6	1.7	52.3	43.6	. .	16.6	10.0	34 52.54	− 2.60	. .	−42.13	23 34 7.81	+ 0.52
	3	Groom. 4163, S. P.	Sk.	9.0	0.0	54.5	32.8	25.5	18.3	56.3	50.8	41.6	49 25.42	− 2.21	. .	−42.14	23 48 41.07	− 0.02
	4	η Virginis (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	5	Polaris, S. P.	Sk.	. .	. .	42.0	17.0	48.0	22.0	56.0	. .	. .	12 49.00	−18.82	. .	−42.19	1 11 47.99	+ 0.49
	6	50 Cassiopeæ, S. P.	Sk.	. .	. .	40.4	34.0	27.2	20.6	. .	. .	. .	53 27.26	− 2.05	. .	−42.22	1 52 42.99	− 0.10
	7	Moon II, S.	Sk.	10.0	12.7	14.3	20.9	23.0	25.1	31.7	33.3	36.0	16 23.00	− 0.87	. .	−42.21	14 15 39.92	−63.29
	8	5 Ursæ Minoris	Sk.	45.6	56.3	2.7	28.5	36.9	45.8	11.4	18.0	28.8	28 37.11	+ 1.26	. .	−42.24	14 27 56.13	+ 0.05
	9	ε Bootis	Sk.	2.8	5.7	7.4	14.2	16.5	18.8	25.8	27.4	30.4	40 16.56	− 0.52	−42.19	−42.25	14 39 33.79	− 0.08
	10	α² Libræ	Sk.	30.3	32.9	34.5	40.8	43.0	45.0	51.4	53.0	55.6	44 42.94	− 0.86	−42.35	−42.26	14 43 59.82	+ 0.08
	11	B. A. C. 334	E.	11.2	14.5	16.5	23.8	26.4	29.0	36.4	38.3	41.4	3 26.39	− 0.45	. .	−42.81	1 2 43.13	+ 1.27
	12	Polaris	E.	. .	. .	20.0	46.0	11.0	36.0	. .	. .	. .	12 11.54	+17.55	. .	−42.85	1 11 47.50	− 0.17
21	13	Sun I, S.	E.	31.8	34.3	36.0	42.0	44.3	46.5	52.7	54.4	56.8	55 44.31	− 0.64	. .	−42.85	1 55 0.82	. .
	14	Sun II, N.	E.	45.1	46.7	50.8	52.7	54.9	57.0	59.1	3.4	5.1	57 54.98	− 0.64	. .	−42.85	1 57 11.49	. .
	15	α Persei	E.	47.3	51.4	53.5	2.9	6.1	9.4	18.6	21.0	24.9	16 6.12	− 0.21	. .	−42.93	3 15 22.98	+ 0.17
	16	δ Persei	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	17	η Tauri	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	18	ζ Persei	E.	44.9	47.7	49.6	56.7	59.0	1.5	8.7	10.5	13.5	46 59.12	− 0.46	−42.89	−42.94	3 46 15.72	− 0.06
	19	α Tauri	E.	15.2	17.9	19.6	25.9	28.0	30.1	36.4	38.0	40.8	29 27.99	− 0.61	−42.96	−42.97	4 28 44.41	− 0.03
	20	ι Aurigæ	E.	19.5	22.5	24.4	31.6	34.1	36.6	43.9	45.7	48.7	49 34.11	− 0.44	−42.99	−42.98	4 48 50.69	− 0.03
	21	Uranus C.	E.	. .	. .	49.4	51.6	53.8	56.0	58.1	. .	. .	55 53.78	− 0.57	. .	−43.13	8 55 10.08	. .
	22	B. A. C. 3146	E.	24.4	26.8	28.3	34.4	36.5	38.5	44.6	46.0	48.7	8 36.47	− 0.69	. .	−43.14	9 7 52.64	− 1.18
	23	B. A. C. 3162¹	E.	33.0	36.2	38.0	. .	. .	. .	58.6	0.5	3.8	11 48.35	− 0.38	. .	−43.14	9 11 4.83	− 1.44
	24	B. A. C. 3162²	E.	. .	. .	43.4	46.0	48.6	51.3	53.8	. .	. .	11 48.62	− 0.38	. .	−43.14	9 11 5.10	− 1.44
	25	B. A. C. 3273	E.	48.3	51.3	53.0	0.2	2.6	5.0	12.3	14.0	17.0	30 2.63	− 0.44	. .	−43.16	9 29 19.03	− 1.45
	26	B. A. C. 3321	E.	27.7	30.4	32.0	38.3	40.5	42.5	48.8	50.4	53.0	37 40.40	− 0.60	. .	−43.17	9 36 56.63	− 1.21
	27	ε Leonis	E.	16.8	19.6	21.3	27.9	30.2	32.4	39.2	40.9	43.7	39 30.22	− 0.52	−43.17	−43.18	9 38 46.52	− 0.07
	28	μ Leonis	E.	10.5	13.4	15.0	21.9	24.3	26.5	33.4	35.0	37.9	46 24.21	− 0.50	−43.23	−43.19	9 45 40.52	+ 0.03
	29	B. A. C. 3398	E.	21.0	23.6	25.2	31.4	33.4	35.5	41.8	43.3	45.8	50 33.44	− 0.64	. .	−43.18	9 49 49.62	− 1.21
	30	B. A. C. 3417	E.	0.6	3.7	5.7	13.0	15.6	18.0	25.7	27.4	30.7	54 15.60	− 1.03	. .	−43.18	9 53 31.39	− 0.78
	31	α Leonis	E.	15.4	18.0	19.6	25.8	27.9	30.0	36.3	37.8	40.5	2 27.92	− 0.62	−43.18	−43.20	10 1 44.10	− 0.06
	32	B. A. C. 3494	E.	24.2	27.0	29.0	36.3	38.7	41.2	48.5	50.3	53.3	8 38.72	− 1.00	. .	−43.18	10 7 44.54	− 0.88
	33	γ¹ Leonis	E.	36.9	39.5	41.2	47.8	50.0	52.2	58.6	0.3	2.9	13 49.93	− 0.55	−43.19	−43.20	10 13 6.18	− 0.03
	34	B. A. C. 3572	E.	9.0	12.4	14.1	19.4	21.9	24.6	27.0	29.6	. .	21 24.49	− 0.38	. .	−43.19	10 20 40.92	− 1.92
	35	B. A. C. 3575	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	36	226 Cephei, S. P.	E.	34.4	23.8	17.9	1.7	53.7	45.0	. .	. .	. .	30 45.15	− 2.44	. .	−43.22	22 29 59.49	− 0.03
	37	B. A. C. 3728	E.	49.7	52.8	54.6	2.0	4.6	7.0	14.6	16.4	19.5	47 4.58	− 0.41	. .	−43.21	10 46 20.96	− 1.99
	38	B. A. C. 3742¹	E.	22.5	25.2	27.0	. .	. .	. .	45.0	6.7	49.6	49 36.00	− 0.51	. .	−43.21	10 48 52.28	− 1.77
	39	B. A. C. 3742²	E.	. .	. .	32.0	34.3	36.5	38.8	41.0	. .	. .	49 36.52	− 0.51	. .	−43.21	10 48 52.80	− 1.77
	40	B. A. C. 3776	E.	11.7	14.4	16.0	22.6	24.7	27.0	33.5	35.0	37.9	56 24.76	− 0.55	. .	−43.22	10 55 40.99	− 1.71
	41	B. A. C. 3809	E.	38.6	41.4	43.0	49.8	52.0	54.4	1.3	2.9	5.6	2 52.11	− 0.51	. .	−43.23	11 2 8.37	− 1.83
	42	δ Leonis (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	43	12 Canum Venat.	E.	41.2	44.5	46.4	54.3	57.0	59.6	7.4	9.4	12.7	50 56.94	− 0.36	−43.35	−43.30	12 50 13.28	+ 0.05
	44	B. A. C. 4390	E.	43.0	45.9	47.6	54.5	56.8	59.0	6.3	7.9	10.8	1 56.87	− 0.48	. .	−43.31	13 1 13.08	− 2.24
	45	Polaris, S. P.	E.	. .	. .	42.0	17.0	51.0	23.0	57.0	. .	. .	12 50.00	−18.92	. .	−43.32	1 11 47.76	− 0.10
	46	α Virginis	E.	10.0	12.6	14.2	20.4	22.5	24.5	30.7	32.3	34.8	19 22.44	− 0.80	−43.30	−43.32	13 18 38.32	− 0.04
	47	B. A. C. 4518	E.	15.0	18.4	20.5	28.2	31.0	33.7	41.5	43.5	46.7	26 30.94	− 1.08	. .	−43.33	13 25 46.53	− 1.82
	48	B. A. C. 4522	E.	4.8	7.0	12.3	14.8	17.5	20.0	22.8	27.9	29.9	27 17.44	− 1.08	. .	−43.33	13 26 33.03	− 1.82
	49	B. A. C. 4566	E.	40.4	43.0	44.7	51.4	53.6	55.8	2.4	4.0	6.9	35 53.58	− 0.53	. .	−43.34	13 35 9.71	− 2.14

1, 2, 3, 8. Bisections at set C.
6, 7, 36. Bisections at sets B and D.
7. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	328 48	19.5	10.9	29.0	29.3	30	680	. .	. .	. .	. .	39.0	328 52 56.3	. .	− 35.9	19 58 41.6	+ 2.0
2	295 48	15.7	11.2	26.8	26.5	36	030	. .	. .	. .	046	39.0	295 51 36.4	. .	− 2 2.3	346 55 55.3	+ 0.8
3	292 34	20.5	14.5	29.7	29.8	31	230	. .	. .	. .	260	39.0	292 38 46.1	. .	− 2 22.1	343 42 45.2	+ 2.3
4	141 4	20.5	15.3	2.2	2.0	31	648	650	644	660	694	39.0	141 8 38.5	37.2	− 48.1	89 58 30.8	+ 1.2
5	307 30	26.0	20.4	10.2	8.1	35	580	. .	625	. .	598	39.0	307 33 31.7	. .	− 1 17.7	358 38 35.2	+ 0.1
6	290 40	23.0	18.4	3.7	2.5	29	265	334	. .	. .	. .	39.0	290 45 12.4	. .	− 2 37.0	341 48 56.6	0.0
7	55 2	16.6	11.0	29.4	26.1	19	610	. .	498	. .	352	39.0	55 12 22.0	. .	+ 1 26.2	106 20 9.4	. .
8	322 36	16.6	9.7	29.4	28.0	36	280	. .	. .	. .	310	39.0	322 39 31.6	. .	− 45.8	13 45 7.0	0.0
9	11 14	16.5	10.5	29.4	27.0	36	. .	012	. .	000	. .	39.0	11 17 36.2	. .	+ 12.0	62 24 9.4	+ 2.2
10	54 20	17.5	11.0	0.6	26.5	35	. .	279	. .	293	. .	39.0	54 23 46.5	34.5	+ 1 23.7	105 31 31.4	+ 2.2
11	3 52	12.9	12.5	1.3	28.2	33	. .	575	. .	565	. .	36.8	3 56 11.0	. .	+ 4.1	55 2 36.3	− 3.0
12	310 12	13.5	9.7	3.0	2.0	33	240	. .	290	. .	180	36.8	310 16 15.3	44.0	− 1 9.6	1 21 26.9	+ 1.8
13	27 12	10.7	3.5	25.5	25.8	35	335	240	. .	. .	. .	36.8	27 15 48.7	45.0	+ 30.3	78 22 40.2	. .
14	26 40	16.5	6.5	0.8	0.3	34	. .	. .	. .	685	710	36.8	26 43 54.6	. .	+ 29.6	77 50 45.4	. .
15	349 24	7.7	7.5	28.8	26.7	31	. .	300	. .	300	. .	36.8	349 28 49.5	. .	− 10.9	40 34 59.8	− 0.6
16	351 26	5.7	3.9	25.8	22.4	32	. .	850	. .	900	. .	36.8	351 30 28.6	. .	− 8.7	42 36 41.1	− 1.3
17	15 6	13.7	11.8	3.7	0.7	33	. .	. .	. .	060	100	36.8	15 10 17.6	. .	+ 15.9	66 16 54.7	+ 1.6
18	7 18	3.5	0.3	23.7	21.5	31	. .	795	. .	810	. .	36.8	7 22 47.1	. .	+ 7.6	58 29 15.9	+ 1.3
19	22 34	9.8	5.8	29.3	26.1	35	. .	285	. .	315	. .	36.8	22 37 47.9	. .	+ 24.4	73 44 33.5	+ 2.5
20	5 52	11.5	11.3	2.1	29.2	36	. .	495	. .	555	. .	36.8	5 55 26.0	49.0	+ 6.1	57 1 53.3	+ 1.9
21	20 42	12.8	9.0	29.2	25.4	39	. .	. .	. .	970	975	37.7	20 47 9.2	. .	+ 22.4	71 53 52.8	. .
22	35 58	8.0	2.3	20.0	19.7	32	. .	615	. .	675	. .	37.7	36 2 34.7	44.0	+ 42.9	87 9 38.8	− 2.6
23	1 30	19.0	15.3	3.0	28.8	35	. .	310	. .	300	. .	37.7	1 33 42.4	. .	+ 1.6	52 40 5.2	+ 9.1
24	1 30	19.0	15.3	3.0	28.8	35	. .	395	. .	450	. .	37.7	1 33 40.8	. .	+ 1.6	52 40 3.6	+ 9.1
25	7 6	13.9	10.5	29.4	26.3	33	. .	670	. .	710	. .	37.7	7 10 11.3	. .	+ 7.4	58 16 39.9	+ 6.2
26	24 14	15.0	11.9	29.8	27.3	35	. .	580	. .	650	. .	37.7	24 17 40.7	. .	+ 26.7	75 24 28.6	0.0
27	14 28	11.0	7.5	26.6	23.9	32	. .	865	. .	945	. .	37.7	14 32 26.0	. .	+ 15.3	65 39 2.5	+ 1.9
28	12 14	16.5	12.2	0.5	27.0	35	. .	395	. .	455	. .	37.7	12 17 43.2	. .	+ 12.9	63 24 17.3	+ 2.1
29	29 18	12.0	7.0	25.5	22.5	35	. .	860	. .	950	. .	37.7	29 21 40.5	. .	+ 33.3	80 28 35.0	− 2.3
30	74 4	12.3	6.1	22.3	22.5	34	. .	100	. .	250	. .	37.7	74 8 7.7	. .	+ 3 25.2	125 17 54.6	−14.3
31	26 14	15.3	11.1	29.2	26.8	32	. .	060	. .	070	. .	37.7	26 18 35.5	. .	+ 29.2	77 25 25.9	+ 3.4
32	71 12	14.5	12.2	29.8	27.0	34	. .	545	. .	635	. .	37.7	71 15 56.3	. .	+ 2 52.8	122 25 10.3	−14.0
33	18 20	15.5	13.4	1.5	27.3	30	. .	555	. .	600	. .	37.7	18 24 57.0	. .	+ 19.7	69 31 37.9	+ 2.0
34	1 28	8.6	6.1	24.3	22.0	31	800	810	. .	. .	. .	37.7	1 32 44.9	. .	+ 1.6	52 39 7.7	+ 4.8
35	28 26	13.7	10.0	26.6	24.5	37	. . .	. .	. .	520	530	37.7	28 29 14.1	. . .	+ 32.2	79 36 7.5	− 3.5
36	294 26	17.3	11.1	1.9	29.2	32	310	315	405	. .	. .	37.7	294 30 29.2	. .	− 2 9.3	345 34 41.4	+ 1.8
37	3 56	10.2	9.1	27.5	25.0	33	. .	555	. .	630	. .	37.7	4 0 14.9	. .	+ 4.2	55 6 40.3	+ 2.3
38	13 24	8.5	5.3	23.8	22.2	32	875	. .	. .	. .	915	37.7	13 28 28.6	. .	+ 14.2	64 35 4.0	− 0.6
39	13 24	8.5	5.3	23.8	22.2	32	. .	755	. .	815	. .	37.7	13 28 30.2	. .	+ 14.2	64 35 5.6	− 0.6
40	17 58	9.8	7.5	25.0	23.3	33	. .	140	. .	175	. .	37.7	18 2 23.0	41.0	+ 19.3	69 9 3.5	− 2.4
41	13 30	15.4	14.0	3.5	29.8	36	. .	720	. .	725	. .	37.7	13 33 21.7	. .	+ 14.3	64 39 57.2	− 1.5
42	162 16	16.1	12.1	28.8	28.2	37	760	770	. .	835	845	37.7	162 19 6.7	. .	− 18.9	68 47 33.4	+ 0.8
43	359 50	19.5	16.0	5.7	0.8	33	. .	450	. .	505	. .	37.7	359 54 9.2	. .	− 0.1	51 0 30.3	+ 2.0
44	10 32	19.3	14.5	3.5	29.3	34	. .	770	. .	770	. .	37.7	10 35 50.6	. .	+ 11.2	61 42 23.0	− 9.2
45	307 30	15.0	11.5	0.5	28.5	36	025	. .	060	. .	010	37.7	307 33 33.6	. .	− 1 17.6	358 38 37.2	+ 2.4
46	49 18	12.2	8.7	27.0	23.5	29	. .	720	. .	750	. .	37.7	49 23 13.8	. .	+ 1 9.7	100 30 44.7	+ 1.8
47	78 4	11.0	5.4	25.7	23.0	30	. .	975	. .	040	. .	37.7	78 8 55.7	. .	+ 4 37.7	129 19 54.6	−14.8
48	78 4	11.0	5.4	25.7	23.0	36	. .	. .	. .	690	710	37.7	78 7 28.7	. .	+ 4 37.8	129 18 27.7	−14.8
49	15 42	14.1	10.0	29.2	26.2	35	. .	175	. .	275	. .	37.7	15 45 47.9	. .	+ 16.9	66 52 26.0	−12.2

No.	Barom.	At. Ther.
	in.	°
4	29.94	41.2
10	29.94	38.0
12	30.00	42.0
13	29.99	43.5
20	29.95	48.0
22	29.98	45.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
7	−44 16.3	− 14 46.1	. .	− 59 2.4
13	− 4.0	− 15 57.4	. .	− 16 1.4
14	− 4.0	+ 15 57.4	. .	+ 15 53.4
21	− 0.2	. .	. .	− 0.2

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Apr. 21	1	Jupiter I, S.	E.	45.0	47.7	49.1	. .	. .	. .	5.6	7.2	9.8	39 57.40	− 0.78	. .	−43.34	13 39 13.28	. .
	2	Jupiter II, N.	E.	. .	. .	56.4	58.4	0.5	2.6	4.6	. .	. .	40 0.50	− 0.78	. .	−43.34	13 39 16.38	. .
	3	α Bootis	E.	30.6	33.4	35.0	41.5	43.6	45.7	52.3	53.8	56.5	10 43.60	− 0.56	−43.37	−43.36	14 9 59.68	+ 0.01
	4	B. A. C. 4759	E.	51.0	54.5	56.4	4.4	6.9	9.5	17.4	19.4	22.6	16 6.90	− 1.08	. .	−43.36	14 15 22.46	− 1.94
	5	θ Bootis (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	6	5 Ursæ Minoris (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	7	ε Bootis	E.	3.8	6.8	8.5	15.5	17.7	20.0	27.0	28.7	31.6	40 17.73	− 0.48	−43.39	−43.38	14 39 33.87	− 0.01
	8	α² Libræ	E.	31.3	34.0	35.6	41.9	44.0	46.1	52.6	53.9	56.7	44 44.01	− 0.84	−43.42	−43.38	14 43 59.79	+ 0.03
	9	β Ursæ Minoris (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	10	B. A. C. 4954	E.	42.6	45.8	47.8	55.9	58.5	1.2	9.4	11.4	14.7	57 58.59	− 1.10	. .	−43.40	14.57 14.09	− 2.03
	11	Moon, S.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	12	B. A. C. 4996	E.	46.4	49.5	51.2	59.0	1.5	3.9	11.4	13.4	16.5	6 1.42	− 1.03	. .	−43.40	15 5 16.99	− 1.95
	13	Venus II	F.	44.7	47.0	48.9	55.0	57.0	59.0	5.2	6.8	9.4	37 57.00	− 0.73	. .	−43.69	23 37 12.58	− 0.50
22	14	Sun I, N.	F.	17.0	19.5	21.0	27.4	29.5	31.6	37.9	39.4	42.0	59 29.48	− 0.60	. .	−43.79	1 58 45.09	. .
	15	Sun II, S.	F.	27.6	30.4	32.0	37.9	40.1	42.5	48.6	50.3	52.8	1 40.24	− 0.60	. .	−43.79	2 0 55.85	. .
	16	B. A. C. 4124	F.	56.8	59.3	0.9	7.2	9.3	11.5	18.0	19.6	22.2	10 9.42	− 0.84	. .	−44.21	12 9 24.37	− 1.54
	17	B. A. C. 4184	F.	31.1	33.9	35.5	42.2	44.6	46.8	53.6	55.2	57.9	19 44.53	− 0.51	. .	−44.21	12 18 59.81	− 2.07
	18	β Corvi	F.	23.0	25.7	27.2	33.9	36.2	38.3	45.0	46.6	49.3	28 36.13	− 0.90	−44.25	−44.20	12 27 51.03	+ 0.01
	19	B. A. C. 4296	F.	4.0	6.6	8.0	14.2	16.2	18.3	24.5	26.0	28.6	42 16.27	− 0.68	. .	−44.23	12 41 31.36	− 1.80
	20	B. A. C. 4315	F.	9.6	12.4	14.1	21.0	23.4	25.7	32.8	34.4	37.3	46 23.41	− 0.47	. .	−44.23	12 45 38.71	− 2.21
	21	12 Canum Venat.	F.	42.0	45.2	47.2	55.1	57.7	0.5	8.3	10.2	13.6	50 57.76	− 0.35	−44.19	−44.22	12 50 13.19	− 0.03
	22	B. A. C. 4351	F.	18.5	21.3	22.8	29.1	31.3	33.5	40.0	41.5	44.2	53 31.36	− 0.56	. .	−44.23	12 52 46.57	− 2.01
	23	B. A. C. 4393	F.	. .	. .	53.1	55.4	57.7	59.9	2.4	. .	. .	1 57.70	− 0.47	. .	−44.24	13 1 12.99	− 2.24
	24	B. A. C. 4433	F.	33.8	37.0	39.0	47.3	49.7	52.8	0.8	2.8	6.1	8 49.92	− 0.32	. .	−44.24	13 8 5.36	− 2.63
	25	Polaris, S. P.	F.	. .	. .	46.0	20.0	53.0	25.0	. .	. .	. .	12 52.71	−19.98	. .	−44.23	1 11 48.50	+ 0.25
	26	α Virginis	F.	11.0	13.4	15.0	21.3	23.4	25.4	31.8	33.2	36.0	19 23.39	− 0.79	−44.26	−44.24	13 18 38.36	0.00
	27	ζ Virginis	F.	54.1	56.5	58.0	4.2	6.3	8.3	14.6	16.0	18.5	29 6.28	− 0.71	−44.24	−44.24	13 28 21.33	0.00
	28	B. A. C. 4566	F.	41.0	43.9	45.6	52.1	54.4	56.6	3.3	4.9	7.7	36 54.39	− 0.52	. .	−44.25	13 36 9.62	− 2.15
	29	B. A. C. 4575	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	30	α Coronæ Borealis	F.	56.7	59.7	1.4	8.2	10.6	13.0	19.7	21.5	24.4	30 10.58	− 0.48	−44.29	−44.33	15 29 25.77	− 0.04
	31	α Serpentis	F.	. .	49.4	51.5	53.6	55.6	57.7	1.8	3.2	5.8	38 53.53	− 0.66	−44.34	−44.33	15 38 8.54	+ 0.03
	32	ε Serpentis	F.	9.7	12.3	13.8	20.0	22.0	24.0	30.6	31.6	34.2	45 21.96	− 0.67	−44.31	−44.34	15 44 36.95	− 0.03
	33	Moon II	F.	. .	. .	49.0	51.4	53.7	55.8	58.0	. .	. .	53 53.58	− 0.92	. .	−44.32	15 53 8.34	−66.84
24	34	Moon II, S.	Sk.	41.2	44.0	46.0	53.2	55.5	58.0	5.0	7.0	10.0	41 55.54	− 0.97	. .	−46.03	17 41 8.54	−70.08
	35	γ² Sagittarii	Sk.	21.1	24.0	25.7	32.9	35.2	37.6	44.8	46.7	49.5	58 35.28	− 0.98	−45.90	−46.04	17 57 48.26	− 0.13
	36	Mars I, S.	Sk.	52.5	55.3	57.0	. .	. .	. .	14.9	16.5	19.3	7 5.92	− 0.92	. .	−46.05	18 6 18.95	+ 0.47
	37	Mars II, N.	Sk.	. .	. .	2.5	4.7	7.0	9.2	11.4	. .	. .	7 6.96	− 0.92	. .	−46.05	18 6 19.99	− 0.57
	38	δ Ursæ Minoris	Sk.	. .	. .	. .	26.5	2.0	35.0	44.5	9.5	53.5	13 26.51	+ 6.51	. .	−46.05	18 12 46.97	− 0.15
	39	α Lyræ	Sk.	14.4	17.5	19.6	27.4	30.0	32.5	40.4	42.4	45.6	33 29.98	− 0.38	−46.08	−46.06	18 32 43.54	+ 0.04
	40	51 Cephei, S. P.	Sk.	. .	. .	. .	. .	. .	. .	16.0	45.0	52.0	42 6.28	− 9.59	. .	−46.06	6 41 10.63	+ 0.09
	41	β Lyræ	Sk.	0.9	4.0	5.7	13.0	15.4	17.8	25.2	27.0	30.0	46 15.44	− 0.44	−46.06	−46.07	18 45 28.93	+ 0.02
	42	50 Draconis	Sk.	. .	. .	. .	2.2	10.4	18.3	42.7	48.6	58.5	51 10.32	+ 0.92	. .	−46.07	18 50 25.17	+ 0.33
	43	ζ Aquilæ	Sk.	15.0	17.8	19.4	25.6	27.7	29.8	36.1	37.8	40.3	0 27.72	− 0.62	−46.21	−46.08	18 59 41.02	+ 0.21
28	44	α Andromedæ	E.	30.9	33.8	35.6	42.5	44.9	47.2	54.0	55.9	58.9	2 44.86	− 0.52	−49.38	−49.43	0 1 54.91	− 0.03
	45	γ Pegasi	E.	24.9	27.5	29.0	35.5	37.6	39.8	46.0	47.6	50.1	7 37.56	− 0.57	−49.50	−49.43	0 6 47.56	+ 0.07
	46	B. A. C. 166	E.	13.8	16.9	18.6	25.6	28.0	30.3	37.0	39.0	42.2	33 27.93	− 0.52	. .	−49.48	0 32 37.93	+ 0.93
	47	β Ceti	E.	. .	. .	4.4	6.6	8.8	10.9	13.1	. .	. .	38 8.76	− 0.65	−49.58	−49.44	0 37 18 67	+ 0.19
	48	Polaris	E.	. .	. .	41.0	4.0	36.0	0.0	26.0	. .	. .	12 33.40	+ 8.50	. .	−49.47	1 11 52.43	+ 2.02
29	49	Sun I, S.	E.	44.9	47.5	49.0	55.3	57.5	59.7	6.0	7.6	10.2	25 57.52	− 0.57	. .	−49.53	2 25 7.42	. .
	50	Sun II, N.	E.	56.7	59.2	0.8	7.0	9.3	11.4	17.8	19.4	22.0	28 9.29	− 0.57	. .	−49.53	2 27 19.19	. .

6, 9, 11, 24, 34, 38, 40. Bisections at sets B and D.
42. Bisections at set C.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan's Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	47 30	10 18.0	9.3	3.0	0.0	34	635	. .	. .	. .	800	37.7	47 33 52.7	. .	+ 1 5.4	98 41 19.3	. .
2	47 30	18.0	9.3	3.0	0.0	37	. .	650	. .	700	. .	37.7	47 33 7.5	. .	+ 1 5.4	98 40 34.1	. .
3	19 0	20.7	17.2	5.3	1.7	35	. .	925	. .	930	. .	37.7	19 3 30.8	. .	+ 20.7	70 10 12.7	+ 1.8
4	77 42	17.3	12.0	29.0	27.6	35	. .	295	. .	360	. .	37.7	77 45 44.3	. .	+ 4 30.4	128 56 35.9	−13.6
5	193 28	14.2	9.7	27.3	26.1	35	870	980	. .	995	890	37.7	193 31 36.8	. .	+ 14.5	37 34 29.9	+ 2.7
6	217 16	14.4	12.0	0.8	26.1	32	290	. .	310	. .	240	37.7	217 20 31.7	. .	+ 45.8	13 45 3.7	− 2.0
7	11 14	13.5	11.3	0.0	26.5	35	. .	985	. .	000	. .	37.7	11 17 35.7	. .	+ 12.0	62 24 8.9	+ 1.9
8	54 20	15.0	10.0	1.0	27.0	35	. .	355	. .	355	. .	37.7	54 23 44.8	. .	+ 1 23.8	105 31 29.8	+ 0.5
9	215 42	14.7	10.3	0.0	25.7	34	720	. .	710	. .	710	37.7	215 45 24.5	. .	+ 43.3	15 20 13.4	− 2.8
10	79 20	15.6	9.0	26.3	25.0	37	. .	215	. .	290	. .	37.7	79 23 17.3	. .	+ 5 11.5	130 34 50.0	−12.0
11	59 52	15.2	11.5	1.4	28.5	32	365	. .	230	. .	090	37.7	59 56 31.8	. .	+ 1 43.6	111 4 36.6	. .
12	74 24	13.8	8.5	26.6	26.4	36	. .	820	. .	850	. .	37.7	74 27 23.9	35.0	+ 3 33.2	125 37 18.3	−12.4
13	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	39.3	. .	. . . .	. .
14	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
15	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	45.1	. .	. . . .	. .
16	55 40	20.4	9.9	1.2	28.4	37	. .	000	. .	004	. .	36.7	55 43 16.9	. .	+ 1 27.0	106 51 5.1	−13.8
17	14 12	16.9	8.4	28.4	26.0	33	. .	238	. .	246	. .	36.7	14 16 17.2	40.2	+ 15.1	65 22 53.5	− 6.8
18	61 30	21.7	10.2	25.8	26.2	32	. .	812	. . .	822	. .	36.7	61 34 22.4	. .	+ 1 49.3	112 42 32.9	+ 1.1
19	34 34	14.7	2.6	22.1	22.3	35	. .	342	. .	358	. .	36.7	34 37 49.4	. .	+ 41.0	85 44 51.6	−11.6
20	10 36	11.8	8.6	24.0	22.6	33	. .	418	. .	426	. .	36.7	10 40 17.7	. .	+ 11.2	61 46 50.1	− 8.0
21	359 50	17.4	13.9	29.3	1.5	33	. .	550	. .	562	. .	36.7	359 54 9.5	. .	− 0.1	51 0 30.6	+ 2.5
22	20 44	13.6	5.5	24.5	21.7	32	. .	980	. .	986	. .	36.7	20 48 24.8	. .	+ 22.6	71 55 8.6	−10.1
23	10 32	13.0	6.3	24.7	22.4	35	. .	. .	. .	228	236	36.7	10 35 50.6	. .	+ 11.1	61 42 22.9	− 9.1
24	358 0	8.3	4.8	21.6	24.7	30	. .	958	. .	942	. .	36.7	358 4 57.3	. .	− 2.0	49 11 16.5	− 7.6
25	307 30	12.8	4.6	20.0	23.2	36	. .	638	638	652	. .	36.7	307 33 29.6	. .	− 1 17.4	358 38 33.4	− 1.0
26	49 18	12.6	5.6	21.2	21.5	30	. .	816	. .	830	. .	36.7	49 23 14.1	39.1	+ 1 9.3	100 30 44.6	+ 1.7
27	38 46	14.1	5.0	21.7	22.8	32	. .	840	. .	846	. .	36.7	38 50 27.2	. .	+ 47.9	89 57 36.3	+ 1 8
28	15 42	13.6	6.5	25.2	23.4	35	318	328	. .	. .	. .	36.7	15 45 47.9	. .	+ 16.8	66 52 25.9	−12.0
29	15 30	14.0	6.5	26.0	23.5	35	812	812	. .	. .	. .	36.7	15 33 40.1	. .	+ 16.6	66 40 17.9	−12.1
30	11 42	14.9	7.4	27.0	24.0	36	. .	290	. .	296	. .	36.7	11 45 32.2	. .	+ 12.4	62 52 5.8	+ 0.2
31	32 0	14.8	7.2	24.3	23.1	34	. .	. .	. .	182	192	36.7	32 4 5.6	. .	+ 37.4	83 11 4.2	+ 1.3
32	33 58	14.2	7.0	23.8	23.6	34	784	778	. .	794	806	36.7	34 1 56.2	. .	+ 40.3	85 8 57.7	+ 0.9
33	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	37.2	. .	. . . .	. .
34	68 8	12.5	8.0	25.2	24.0	33	090	. .	132	. .	160	38.2	68 12 22.7	. .	+ 2 28.7	119 21 12.6	. .
35	69 12	18.0	10.5	26.1	25.3	32	. .	252	. .	300	. .	38.2	69 16 33.1	36.2	+ 2 37.0	120 25 31.3	+ 0.5
36	62 52	14.3	8.0	26.1	24.3	29	098	. .	. .	. .	380	38.2	62 57 21.2	. .	+ 1 56.8	114 5 39.2	−18.1
37	62 52	14.3	8.0	26.1	24.3	30	. .	208	. .	180	. .	38.2	62 57 6.8	. .	+ 1 56.8	114 5 24.8	− 3.7
38	312 14	16.0	13.5	28.9	28.0	31	. .	. .	. .	574	632	38.2	312 18 43.0	. .	− 1 5.7	3 24 58.5	+ 0.9
39	0 10	18.4	15.1	3.1	29.6	34	. .	. .	. .	512	542	38.2	0 13 55.5	. .	+ 0.2	51 20 16.9	− 0.5
40	306 6	18.5	14.2	27.5	27.2	36	. .	. .	. .	294	232	38.2	306 9 29.2	. .	− 1 21.8	357 14 28.6	− 0.8
41	5 36	19.8	15.5	2.5	29.6	30	. .	860	. .	892	. .	38.2	5 40 50.5	. .	+ 6.0	56 47 17.7	+ 2.5
42	323 34	19.5	12.9	0.9	28.0	35	.401	. .	. .	. .	465	38.2	323 37 42.1	. .	− 44.0	14 43 19.3	− 0.8
43	25 8	15.8	11.2	29.5	25.3	31	. .	440	. .	440	. .	38.2	25 12 45.7	36.5	+ 28.2	46 19 35.1	+ 2.8
44	10 26	14.5	12.8	2.5	28.4	35	. .	900	. .	835	. .	37.1	10 29 35.3	55.5	+ 10.7	61 36 7.2	+ 1.5
45	24 20	19.7	15.8	4.3	0.0	34	. .	085	. .	095	. .	37.1	24 23 59.5	. .	+ 26.1	75 30 46.8	+ 1.6
46	8 38	9.8	5.7	25.4	22.3	30	. .	740	. .	810	. .	37.1	8 42 59.5	. .	+ 8.8	59 49 29.5	− 5.4
47	57 28	6.5	4.4	23.7	22.2	32	. .	730	. .	790	. .	37.1	57 32 30.4	. .	+ 1 29.8	108 40 21.4	+ 1.7
48	310 12	15.2	13.2	1.0	28.0	33	310	. .	330	. .	380	37.1	310 16 14.3	. .	− 1 7.4	1 21 28.1	+ 0.9
49	24 36	21.1	16.3	4.0	0.8	34	970	990	. .	. .	. .	37.1	24 39 44.6	. .	+ 26.1	75 46 31.9	. .
50	24 4	18.7	10.1	0.5	27.2	34	. .	. .	. .	615	630	37.1	24 7 55.5	61.3	+ 25.5	75 14 42.2	. .

No.	Barom.	At. Ther.
	in.	°
12	30.03	37.0
13	30.06	40.0
15	30.12	44.8
17	29.98	44.0
26	29.96	42.0
32	29.93	39.5
35	29.95	37.6
43	29.97	37.8
44	29.98	52.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
1	— 1.5	— 22.6	. .	— 24.1
2	— 1.5	+ 22.6	. .	+ 21.1
11	—46 36.2	— 14 44.7	. .	—1 1 20.9
34	—50 23.4	— 14 51.1	. .	—1 5 14.5
36	— 10.9	— 7.2	. .	— 18.1
37	— 10.9	+ 7.2	. .	— 3.7
49	— 3.7	— 15 54.8	. .	— 15 58.5
50	— 3.6	+ 15 54.8	. .	+ 15 51.2

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Apr. 29	1	B. A. C. 3728	E.	56.0	59.0	0.9	8.4	11.0	13.5	20.9	22.7	25.9	47 10.92	− 0.48	. .	−49.72	10 46 20.72	− 1.89
	2	B. A. C. 3742^1	E.	28.9	31.7	33.4	. .	. .	. .	51.5	53.0	55.9	49 42.40	− 0.52	. .	−49.72	10 48 52.16	− 1.68
	3	B. A. C. 3742^2	E.	. .	. .	38.3	40.6	42.9	45.0	47.4	. .	. .	49 42.84	− 0.52	. .	−49.72	10 48 52.60	− 1.68
	4	B. A. C. 3776	E.	17.9	20.8	22.3	29.0	31.1	33.3	40.0	41.5	44.1	56 31.11	− 0.54	. .	−49.72	10 55 40.85	− 1.63
	5	B. A. C. 3809	E.	44.9	47.7	49.5	56.2	58.5	0.8	7.7	9.3	12.0	2 58.51	− 0.52	. .	−49.72	11 2 8.27	− 1.75
	6	δ Leonis	E.	6.3	9.0	10.7	17.1	19.4	21.5	28.2	29.8	32.6	8 19.40	− 0.54	−49.66	−49.77	11 7 29.09	− 0.17
	7	δ Crateris	E.	44.7	47.3	48.9	55.0	57.1	59.3	5.7	7.3	9.9	13 57.24	− 0.63	−49.79	−49.77	11 13 6.84	0.00
	8	B. A. C. 3890	E.	2.7	5.8	7.6	15.2	17.6	20.2	27.8	29.7	32.9	20 17.72	− 0.69	. .	−49.73	11 19 27.30	− 1.18
	9	B. A. C. 3930	E.	37.7	40.2	41.9	47.9	50.0	52.1	58.0	59.6	2.2	28 49.96	− 0.59	. .	−49.73	11 27 59.64	− 1.53
	10	B. A. C. 3973	E.	35.9	39.4	41.5	49.8	52.5	55.3	13.5	15.5	19.0	37 52.49	− 0.44	. .	−49.74	11 37 2.31	− 2.40
	11	β Leonis	E.	20.4	23.0	24.5	30.9	32.9	35.0	41.5	43.0	45.7	43 32.99	− 0.56	−49.74	−49.77	11 42 42.66	− 0.05
	12	B. A. C. 4046	E.	46.8	49.8	51.8	59.3	1.8	4.3	11.8	13.7	16.6	54 1.77	− 0.69	. .	−49.75	11 53 11.33	− 1.38
	13	o Virginis	E.	30.0	32.8	34.3	40.5	42.6	44.7	50.8	52.4	55.0	59 42.57	− 0.57	−49.79	−49.80	11 58 52.20	− 0.03
	14	B. A. C. 4099	E.	48.6	51.4	52.9	59.4	1.5	3.5	10.0	11.6	14.3	5 1.47	− 0.55	. .	−49.75	12 4 11.17	− 1.86
	15	B. A. C. 4184	E.	36.5	39.4	41.1	47.7	50.0	52.2	59.0	0.7	3.5	19 50.01	− 0.52	. .	−49.75	12 18 59.74	− 2.04
	16	B. A. C. 4212	E.	5.5	8.4	10.0	16.5	18.7	20.9	27.5	29.0	32.0	24 18.72	− 0.54	. .	−49.76	12 23 28.42	− 2.00
	17	B. A. C. 4235	E.	24.4	27.8	30.0	38.1	41.0	43.7	52.0	54.0	57.6	28 40.96	− 0.44	. .	−49.76	12 27 50.76	− 2.58
	18	B. A. C. 4296	E.	9.5	12.0	13.6	19.6	21.7	23.7	30.0	31.5	34.1	42 21.74	− 0.59	. .	−49.77	12 41 31.38	− 1.80
	19	Polaris, S. P.	E.	. .	. .	. .	. .	52.0	26.0	. .	. .	. .	12 52.28	− 9.89	. .	−49.83	1 11 52.56	+ 2.00
	20	Venus II, N.	F.	52.6	55.3	56.9	3.0	5.0	7.0	13.2	14.8	17.3	13 5.01	− 0.48	. .	−49.93	0 12 14.60	− 0.47
	21	Venus, S.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	22	Polaris	F.	. .	. .	. .	6.0	34.0	0.0	26.0	. .	. .	12 33.32	+ 6.42	. .	−50.13	1 11 49.61	− 1.10
30	23	ζ Persei	F.	52.0	55.0	56.7	3.9	6.4	8.9	15.9	17.6	20.7	47 6.34	− 0.42	−50.16	−50.20	3 46 15.72	− 0.05
	24	γ^1 Eridani	F.	49.6	52.1	53.8	. .	. .	. .	. .	. .	. .	53 2.18	− 0.49	−50.40	−50.20	3 52 11.49	+ 0.24
	25	α Tauri	F.	22.4	25.0	26.6	32.9	35.0	37.0	. .	. .	. .	29 35.05	− 0.45	−50.21	−50.23	4 28 44.37	− 0.04
	26	β Orionis	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	27	β Tauri	F.	59.7	2.7	4.3	11.4	13.7	16.0	23.0	24.7	27.6	19 13.68	− 0.43	−50.25	−50.24	5 18 23.01	− 0.01
	28	δ Orionis	F.	. .	. .	23.6	25.5	27.7	29.7	31.8	. .	. .	26 27.66	− 0.48	−50.28	−50.25	5 25 36.93	0.00
	29	Polaris, S. P.	F.	26.0	35.0	34.0	39.0	. .	. .	. .	. .	. .	12 47.23	− 6.90	. .	−50.47	1 11 49.86	− 1.02
	30	ζ Virginis	F.	0.1	2.6	4.2	10.2	12.3	14.3	20.3	22.0	24.5	29 12.28	− 0.50	−50.42	−50.47	13 28 21.31	− 0.05
	31	Jupiter I, S.	F.	39.2	41.4	43.4	. .	. .	. .	59.9	1.5	4.0	35 51.63	− 0.50	. .	−50.39	13 35 0.74	. .
	32	Jupiter II, N.	F.	. .	. .	50.4	52.6	54.8	56.7	58.8	. .	. .	35 54.66	− 0.50	. .	−50.39	13 35 3.77	. .
	33	η Bootis	F.	26.6	28.2	32.6	34.7	36.9	39.1	41.2	45.7	47.2	49 36.91	− 0.47	−50.36	−50.48	13 48 45.96	− 0.17
May 4	34	B. A. C. 3742	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	35	B. A. C. 3776	F.	21.4	24.2	25.7	32.1	34.4	36.6	43.0	44.7	47.6	56 34.41	− 0.59	. .	−53.00	10 55 40.82	− 1.58
	36	B. A. C. 3809	F.	48.2	51.1	52.8	. .	. .	. .	10.9	12.5	15.4	3 1.82	− 0.56	. .	−53.00	11 2 8.26	− 1.69
	37	δ Leonis	F.	9.5	12.4	14.0	20.6	22.7	24.9	31.5	33.0	35.8	8 22.71	− 0.58	−52.98	−52.97	11 7 29.16	− 0.05
	38	δ Crateris	F.	47.9	50.6	52.2	58.5	0.6	2.7	8.9	10.6	13.3	14 0.59	− 0.76	−53.05	−52.97	11 13 6.80	+ 0.06
	39	B. A. C. 3930	F.	41.0	43.6	45.0	49.1	53.3	57.3	1.5	2.9	5.5	28 53.24	− 0.68	. .	−53.01	11 27 59.55	− 1.49
	40	B. A. C. 3973	F	39.0	44.7	50.0	52.8	55.5	58.4	1.2	6.6	12.3	37 55.61	− 0.43	. .	−53.01	11 37 2.17	− 2.33
	41	β Leonis	F.	23.6	26.2	27.8	34.0	36.3	38.4	44.8	46.2	49.0	43 36.26	− 0.62	−52.99	−52.99	11 42 42.65	− 0.02
	42	B. A. C. 4099	F.	52.0	54.5	56.2	2.6	4.8	6.9	13.3	14.9	17.7	5 4.77	− 0.61	. .	−53.02	12 4 11.14	− 1.83
	43	B. A. C. 4142	F.	55.4	58.4	0.2	7.0	9.4	11.8	18.7	20.5	23.5	14 9.43	− 0.54	. .	−53.02	12 13 15.87	− 2.09
	44	B. A. C. 4184	F.	. .	. .	. .	. .	. .	. .	2.3	4.0	6.8	19 53.31	− 0.56	. .	−53.03	12 18 59.72	− 2.02
	45	B. A. C. 4212	F.	8.8	13.2	17.6	19.7	21.9	24.2	26.3	30.8	35.1	24 21.96	− 0.58	. .	−53.03	12 23 28.35	− 1.97
	46	B. A. C. 4235	F.	27.7	31.0	33.1	41.5	44.1	46.9	55.1	57.1	0.6	28 44.12	− 0.43	. .	−53.03	12 27 50.66	− 2.54
	47	B. A. C. 4315	F.	18.4	21.4	27.7	30.0	32.2	34.6	36.9	43.3	46.2	46 32.30	− 0.54	. .	−53.04	12 45 38.72	− 2.18
	48	12 Canum Venat.	F.	50.9	54.3	56.2	4.0	6.6	9.3	17.0	19.1	22.5	51 6.66	− 0.46	−53.02	−53.02	12 50 13.18	0.00
	49	B. A. C. 4351	F.	27.4	30.0	31.6	38.0	40.2	42.3	48.8	50.3	53.0	53 40.18	− 0.60	. .	−53.04	12 52 46.54	− 2.00
	50	B. A. C. 4390	F.	52.6	55.5	57.2	4.2	6.6	8.8	15.8	17.5	20.5	2 6.52	− 0.54	. .	−53.04	13 1 12.94	− 2.22

20, 21, 23. Telescope micrometer reading decreased five revolutions in reduction.

24, 43. Telescope micrometer reading increased one revolution in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ′	″
1	3 56	10 17.6	14.3	28.3	27.3	33	. .	. .	. .	425	435	38.8	4 0 15.0	53.5	+ 4.0	55 6 40.2	+ 3.3
2	13 24	12.8	9.3	27.5	22.5	32	. .	745	. .	710	. .	38.8	13 28 29.1	. .	+ 13.7	64 35 4.0	+ 0.2
3	13 24	12.8	9.3	27.5	22.5	32	. .	670	. .	705	. .	38.8	13 28 29.7	. .	+ 13.7	64 35 4.6	+ 0.2
4	17 58	15.7	12.6	28.0	23.0	32	. .	990	. .	040	. .	38.8	18 2 22.9	. .	+ 18.6	69 9 2.7	− 1.6
5	13 30	20.5	19.6	5.6	1.3	36	. .	560	. .	575	. .	38.8	13 33 21.6	. .	+ 13.8	64 39 56.6	− 0.6
6	17 36	13.5	9.4	0.4	25.7	30	. .	795	. .	815	. .	38.8	17 40 56.8	. .	+ 18.2	68 47 36.2	+ 4.5
7	52 56	17.6	14.8	0.6	26.3	39	. .	300	. .	340	. .	38.8	52 58 43.6	. .	+ 1 15.9	104 6 20.7	+ 0.8
8	74 10	29.6	21.6	3.7	3.2	36	. .	910	. .	900	. .	38.8	74 13 13.3	. .	+ 3 19.9	125 22 54.4	−16.6
9	35 4	14.0	9.2	26.9	23.3	35	. .	000	. .	050	. .	38.8	35 7 53.5	. .	+ 40.3	86 14 55.0	− 8.3
10	356 24	17.3	14.2	29.3	25.3	31	. .	600	. .	600	. .	38.8	356 28 46.0	. .	− 3.5	47 35 3.7	+ 1.7
11	23 32	18.8	15.7	1.9	27.0	29	. .	870	. .	855	. .	38.8	23 37 7.6	. .	+ 24.9	74 43 53.7	+ 3.6
12	73 24	13.0	11.0	24.5	23.3	36	. .	400	. .	415	. .	38.8	73 27 32.5	. .	+ 3 10.6	124 37 4.3	−16.7
13	29 24	15.5	11.0	26.0	23.5	35	. .	980	. .	010	. .	38.8	29 27 38.0	. .	+ 32.4	80 34 31.6	+ 2.5
14	21 20	22.3	18.0	3.9	0.7	37	. .	555	. .	550	. .	38.8	21 23 7.0	52.0	+ 22.5	72 29 50.7	− 6.6
15	14 12	24.2	21.5	7.5	2.9	32	. .	700	. .	700	. .	38.8	14 16 18.5	. .	+ 14.6	65 22 54.3	− 5.8
16	17 14	17.4	14.5	0.5	25.5	33	. .	675	. .	715	. .	38.8	17 18 10.3	. .	+ 17.9	68 24 49.4	− 6.8
17	356 48	17.7	15.0	29.0	25.7	36	. .	200	. .	255	. .	38.8	356 51 31.8	. .	− 3.2	47 57 49.8	− 2.5
18	34 34	17.0	11.7	26.2	24.2	35	. .	045	. .	120	. .	38.8	34 37 51.2	. .	+ 39.7	85 44 52.1	−11.3
19	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
20	39 12	16.8	13.4	28.5	24.7	36	628	. .	. .	. .	608	36.2	39 16 40.5	61.0	+ 46.5	90 23 48.2	. .
21	39 12	16.8	13.4	28.5	24.7	35	. .	596	. .	606	. .	36.2	39 16 56.0	61.0	+ 46.5	90 24 3.7	. .
22	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	36.2	. . . .	. .	. .	. . . .	. .
23	7 18	15.5	14.8	0.8	27.3	36	. .	094	. .	102	. .	36.2	7 22 47.4	69.2	+ 7.2	58 29 15.8	+ 0.2
24	52 40	15.7	11.9	26.3	22.8	32	. .	. .	. .	180	. .	36.2	52 44 18.4	. .	+ 1 13.3	103 51 52.9	+ 0.7
25	22 34	19.8	18.5	2.3	28.4	34	748	. .	. .	. .	756	36.2	22 37 48.8	. .	+ 23.2	73 44 33.2	+ 2.2
26	47 10	17.8	13.5	28.1	25.2	36	. .	130	. .	. .	246	36.2	47 13 30.2	. .	+ 1 0.0	98 20 51.4	+ 1.7
27	10 20	13.6	12.6	27.7	24.8	36	. .	826	. .	834	. .	36.2	10 23 22.0	. .	+ 10.2	61 29 53.4	+ 1.8
28	39 12	16.2	13.2	22.3	23.6	32	520	. .	. .	. .	520	36.2	39 16 28.7	71.5	+ 45.4	90 23 35.3	+ 1.8
29	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
30	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
31	47 6	12.1	12.6	26.6	25.0	32	746	774	. .	. .	. .	39.2	47 10 27.4	. .	+ 1 1.9	98 17 50.3	. .
32	47 6	12.1	12.6	26.6	25.0	35	. .	. .	. .	565	575	39.2	47 9 45.0	. .	+ 1 1.9	98 17 8.1	. .
33	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	55.5	. .	. . . .	. .
34	13 24	22.4	16.9	2.3	0.2	32	. .	438	. .	452	. .	39.3	13 28 26.5	. .	+ 14.0	64 35 1.7	+ 0.7
35	17 58	23.1	13.6	1.8	27.9	32	798	794	. .	. .	. .	39.3	18 2 22.2	46.0	+ 19.0	69 9 2.4	− 1.2
36	13 30	22.1	13.0	2.1	28.4	36	. .	766	. .	778	. .	39.3	13 33 21.8	. .	+ 14.1	64 39 57.1	− 0.1
37	17 36	19.0	11.7	29.8	25.5	30	. .	836	. .	850	. .	39.3	17 40 55.0	. .	+ 18.6	68 47 34.8	+ 3.6
38	52 56	17.2	6.5	24.6	23.4	39	. .	. .	. .	780	726	39.3	52 58 42.2	. .	+ 1 17.4	104 6 20.8	+ 0.8
39	35 4	14.9	6.5	22.8	23.7	35	. .	326	. .	336	. .	39.3	35 7 50.7	. .	+ 41.2	86 14 53.1	− 8.0
40	356 24	17.4	9.2	28.6	27.1	31	. .	658	. .	658	. .	39.3	356 28 43.6	. .	− 3.6	47 35 1.2	+ 2.6
41	23 32	19.4	11.4	29.8	27.8	30	. .	096	. .	104	. .	39.3	23 37 5.7	. .	+ 25.6	74 43 52.5	+ 2.8
42	21 20	21.5	14.1	0.5	28.9	37	860	876	. .	. .	. .	39.3	21 23 4.9	45.8	+ 22.9	72 29 49.0	− 6.0
43	9 58	23.2	16.1	3.2	1.2	32	270	274	. .	. .	. .	39.3	10 2 13.2	. .	+ 10.4	61 8 44.8	− 3.6
44	14 12	22.0	12.4	0.3	27.7	33	. .	. .	. .	306	320	39.3	14 16 16.0	. .	+ 14.7	65 22 51.9	− 5.1
45	17 14	23.2	13.5	1.5	29.0	33	648	672	. .	. .	. .	39.3	17 18 8.8	. .	+ 18.3	68 24 48.3	− 6.1
46	356 48	27.0	19.0	3.2	1.3	35	960	956	. .	. .	. .	39.3	356 51 30.5	. .	− 3.2	47 57 48.5	− 1.5
47	10 36	19.2	13.0	29.1	27.7	33	. .	276	. .	286	. .	39.3	10 40 16.9	. .	+ 11.1	61 46 49.2	− 6.0
48	359 50	23.9	16.9	4.8	2.5	33	. .	660	. .	666	. .	39.3	359 54 6.4	. .	− 0.1	51 0 27.5	+ 1.9
49	20 44	15.4	6.4	24.0	22.2	33	. .	136	. .	142	. .	39.3	20 48 24.3	. .	+ 22.3	71 55 7.8	− 8.6
50	10 32	20.8	14.0	29.4	28.5	35	056	064	. .	. .	. .	39.3	10 35 48.6	. .	+ 11.0	61 42 20.8	− 7.0

No.	Barom.	At. Ther.
	in.	°
1	29.69	55.0
20	29.90	56.5
21	29.90	56.5
23	29.86	65.0
28	29.84	67.0
33	29.95	59.5
35	29.86	48.5
42	29.90	48.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
20	− 4.6	+ 8.0	. .	+ 3.4
21	− 4.6	− 8.0	+ 0.5	− 12.1
31	− 1.5	− 21.1	. .	− 22.6
32	− 1.5	+ 21.1	. .	+ 19.6

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
May 4	1	B. A. C. 4433	F.	42.7	46.1	48.0	56.0	58.9	1.5	9.6	11.7	15.0	8 58.83	− 0.45	. .	−53.04	13 8 5.34	− 2.60
	2	Polaris, S. P.	F.	. .	. .	52.0	26.0	0.0	32.0	. .	. .	. .	12 59.22	−13.67	. .	−53.03	1 11 52.52	− 0.52
	3	ζ Virginis	F.	2.9	5.4	7.0	13.0	15.0	17.1	23.3	24.9	27.3	29 15.10	− 0.70	−53.03	−53.04	13 28 21.36	− 0.01
	4	B. A. C. 4566	F.	50.0	52.8	58.9	1.0	3.4	5.6	7.8	. .	. .	36 3.34	− 0.57	. .	−53.04	13 35 9.73	− 2.18
	5	B. A. C. 4575	F.	33.3	36.0	37.8	44.4	46.6	48.8	55.5	57.1	59.9	38 46.60	− 0.57	. .	−53.04	13 37 52.99	− 2.19
	6	η Bootis	F.	26.8	29.6	31.0	37.5	39.7	41.9	48.3	49.9	52.6	49 39.70	− 0.61	−52.99	−53.05	13 48 46.04	− 0.11
	7	α Bootis	F.	40.3	43.0	44.7	51.2	53.3	55.4	2.0	3.6	6.4	10 53.32	− 0.59	−52.99	−53.06	14 9 59.67	− 0.07
	8	ε Bootis	F.	13.9	16.7	18.3	25.3	27.7	29.9	36.8	38.4	41.5	40 27.61	− 0.54	−53.09	−53.08	14 39 33.99	+ 0.01
	9	α^2 Libræ	F.	41.0	43.7	45.4	51.7	53.8	55.9	2.3	3.9	6.6	44 53.81	− 0.77	−53.15	−53.08	14 43 59.96	+ 0.06
6	10	Sun I, N.	Sk.	38.5	41.0	42.6	49.0	51.2	53.4	59.8	1.4	3.9	52 51.20	− 0.56	. .	−54.31	2 51 56.33	. .
	11	Sun II, S.	Sk.	51.0	53.8	55.4	1.6	3.8	6.0	12.5	14.0	16.7	55 3.87	− 0.56	. .	−54.31	2 54 9.00	. .
	12	η Tauri	Sk.	47.0	48.6	53.0	55.3	57.6	59.8	2.0	6.5	8.0	40 57.53	− 0.52	−54.40	−54.33	3 40 2.68	+ 0.07
	13	α Tauri	Sk.	26.5	29.2	30.7	37.1	39.3	41.4	47.8	49.5	52.0	29 39.28	− 0.56	−54.34	−54.35	4 28 44.37	− 0.03
	14	ι Aurigæ	Sk.	30.8	33.9	35.7	42.8	45.5	47.8	55.2	56.9	0.0	49 45.40	− 0.40	−54.32	−54.37	4 48 50.57	− 0.09
	15	α Ursæ Majoris	Sk.	. .	. .	48.4	52.9	57.2	1.8	6.3	. .	. .	56 57.32	− 0.03	. .	−54.58	10 56 2.71	− 0.29
	16	α Andromedæ	E.	36.9	39.8	41.6	48.5	50.8	53.0	0.1	1.9	4.8	2 50.82	− 0.47	−55.19	−55.25	0 1 55.10	− 0.04
	17	γ Pegasi	E.	30.9	33.5	35.0	41.4	43.5	45.6	52.0	53.5	56.2	7 43.51	− 0.55	−55.28	−55.26	0 6 47.70	+ 0.02
	18	α Cassiopeæ	E.	57.2	1.5	4.5	15.5	19.0	22.9	33.8	36.4	41.0	34 19.09	− 0.20	. .	−55.27	0 33 23.62	− 0.04
	19	β Ceti	E.	1.9	4.5	6.2	12.6	14.8	17.0	23.6	25.0	27.6	38 14.80	− 0.68	−55.43	−55.27	0 37 18.85	+ 0.21
	20	B. A. C. 334	E.	24.0	27.3	29.0	36.6	39.1	41.6	49.0	50.9	54.0	3 39.06	− 0.43	. .	−55.32	1 2 43.31	+ 0.96
	21	Polaris	E.	. .	. .	47.0	11.0	37.0	3.0	30.0	. .	. .	12 37.60	+13.28	. .	−55.28	1 11 55.60	+ 1.36
7	22	Sun I, N.	E.	. .	. .	39.8	42.0	44.1	46.2	48.3	. .	. .	56 44.08	− 0.52	. .	−55.37	2 55 48.19	. .
	23	Sun II, S.	E.	44.4	47.0	48.6	55.0	57.1	59.3	5.7	7.3	10.0	58 57.16	− 0.52	. .	−55.37	2 58 1.27	. .
	24	ι Aurigæ	E.	31.8	34.8	36.7	44.0	46.5	49.0	56.3	58.0	1.1	49 46.47	− 0.44	−55.41	−55.39	4 48 50.64	− 0.02
	25	Moon I.	E.	39.3	42.0	43.9	51.0	53.5	55.8	2.9	4.8	7.7	3 53.43	− 0.48	. .	−55.43	5 2 57.52	+78.35
	26	α Orionis	E.	7.7	10.2	11.7	18.0	20.0	22.0	28.3	29.8	32.5	49 20.02	− 0.58	−55.40	−55.41	5 48 24.03	+ 0.02
	27	B. A. C. 4296	E.	15.1	17.8	19.3	25.3	27.4	29.5	35.6	37.1	39.7	42 27.42	− 0.58	. .	−55.56	12 41 31.28	− 1.78
	28	32^1 Camelopardalis	E.	. .	. .	35.0	54.7	14.1	34.4	54.5	. .	. .	49 14.54	+ 2.45	. .	−55.56	12 48 21.43	−15.73
	29	32^2 Camelopardalis	E.	. .	. .	42.7	2.0	21.2	41.5	2.4	. .	. .	49 21.96	+ 2.45	. .	−55.60	12 48 28.81	− 0.69
	30	12 Canum Venat.	E.	56.7	58.5	3.9	6.4	9.0	11.6	14.4	19.7	21.6	51 9.09	− 0.37	−55.56	−55.60	12 50 13.12	− 0.04
	31	B. A. C. 4390	E.	55.0	57.9	59.7	6.6	8.9	11.4	18.1	19.9	22.9	2 8.93	− 0.45	. .	−55.57	13 1 12.91	− 2.21
	32	Polaris, S. P.	E.	. .	. .	. .	. .	6.5	38.5	13.0	22.0	17.5	13 6.13	−14.45	. .	−55.62	1 11 56.06	+ 1.50
	33	α Virginis	E.	22.2	24.9	26.4	32.5	34.6	36.7	42.9	44.5	47.0	19 34.63	− 0.65	−55.61	−55.62	13 18 38.36	− 0.03
	34	ζ Virginis	E.	5.4	8.0	9.6	15.5	17.5	19.6	25.7	27.3	29.8	29 17.60	− 0.60	−55.63	−55.62	13 28 21.38	+ 0.01
	35	Jupiter I, S.	E.	42.0	44.6	46.2	. .	. .	. .	2.6	4.0	6.7	32 54.35	− 0.64	. .	−55.58	13 31 58.13	. .
	36	Jupiter II, N.	E.	. .	. .	53.2	55.3	57.3	59.5	1.5	. .	. .	32 57.36	− 0.64	. .	−55.58	13 32 1.14	. .
	37	η Ursæ Majoris	E.	16.7	20.6	22.9	32.5	35.7	38.8	48.4	50.6	54.6	43 35.64	− 0.26	. .	−55.63	13 42 39.75	− 0.15
	38	η Bootis	E.	29.3	31.9	33.5	39.9	42.0	44.2	50.8	52.4	55.0	49 42.11	− 0.51	−55.49	−55.63	13 48 45.97	− 0.19
10	39	Moon I, N.	Sk.	. .	. .	13.6	15.9	18.2	20.6	23.0	. .	. .	24 18.26	− 0.44	. .	−56.88	8 23 20.94	+72.72
	40	ε Hydræ	Sk.	54.9	57.4	58.9	5.0	7.1	9.2	15.4	17.0	19.6	41 7.17	− 0.44	−56.82	−56.80	8 40 9.93	− 0.02
	41	ι Ursæ Majoris	Sk.	18.4	22.2	24.5	33.7	36.9	40.0	49.0	51.6	55.4	51 36.86	− 0.41	. .	−56.80	8 50 39.65	+ 0.11
	42	α Hydræ	Sk.	12.1	14.8	16.4	22.6	24.6	26.7	32.9	34.5	37.0	22 24.62	− 0.44	−56.90	−56.81	9 21 27.37	+ 0.06
	43	ε Leonis (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	44	α Leonis (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	45	9 Draconis	Sk.	34.7	45.8	52.2	18.0	26.9	35.8	1.3	7.6	18.7	25 26.78	− 0.21	. .	−56.83	10 24 29.74	− 0.10
	46	B. A. C. 3728	Sk.	3.0	6.6	8.0	15.5	18.0	20.4	27.9	29.8	33.0	47 18.02	− 0.43	. .	−56.82	10 46 20.77	− 1.73
	47	α Ursæ Majoris (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	δ Leonis	Sk.	13.3	15.9	17.6	24.0	26.3	28.5	35.0	36.7	39.3	8 26.29	− 0.44	−56.76	−56.84	11 7 29.01	− 0.14

1. Telescope micrometer decreased five revolutions in reduction.
26, 35. Telescope micrometer reading decreased one revolution in reduction.
28, 29, 39, 47. Bisections at sets B and D.
45. Bisections at set C.
48. Telescope micrometer reading increased one revolution in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	358 0	21.5	14.7	0.6	28.7	35	. .	886	. .	882	. .	39.3	358 4 52.1	. .	− 2.0	49 11 11.3	− 5.0
2	307 30	18.2	8.0	21.4	25.5	36	. .	800	798	796	. .	39.3	307 33 27.1	. .	− 1 16.1	358 38 32.2	+ 1.0
3	38 46	14.4	6.5	21.2	22.3	32	. .	966	. .	970	. .	39.3	38 50 27.7	. .	+ 47.3	89 57 36.2	+ 2.2
4	15 42	19.1	13.4	0.4	27.8	35	230	242	. .	. .	. .	39.3	15 45 46.3	. .	+ 16.6	66 52 24.1	−10.0
5	15 30	23.6	13.4	3.2	29.8	35	528	518	. .	. .	. .	39.3	15 33 39.6	. .	+ 16.4	66 40 17.2	−10.2
6	19 48	17.8	10.2	27.2	26.6	34	. .	544	. .	552	. .	39.3	19 51 59.3	. .	+ 21.2	70 58 41.7	+ 1.7
7	19 0	24.0	15.7	2.8	0.3	36	. .	064	. .	072	. .	39.3	19 3 30.8	. .	+ 20.3	70 10 12.3	+ 3.3
8	11 14	20.5	13.8	2.2	29.5	36	014	022	. .	. .	. .	39.3	11 17 33.0	. .	+ 11.8	62 24 6.0	+ 1.6
9	54 20	21.2	9.5	28.2	27.2	35	. .	144	. .	154	. .	39.3	54 23 48.8	43.8	+ 1 22.1	105 31 32.1	+ 2.2
10	22 0	25.8	15.6	5.0	3.0	34	. .	845	. .	. .	. .	35.0	22 3 43.0	. .	+ 22.8	73 10 27.0	. .
11	22 32	11 2.0	19.2	10.4	5.6	35	. .	. .	. .	506	616	35.0	22 35 28.8	64.2	+ 23.4	73 42 13.4	. .
12	15 6	10 15.4	11.6	3.8	0.5	33	. .	. .	. .	040	030	35.0	15 10 16.2	. .	+ 15.3	66 16 52.7	− 0.9
13	22 34	16.0	. .	4.6	29.6	34	. .	716	. .	720	. .	35.0	22 37 49.9	. .	+ 23.5	73 44 34.6	+ 3.7
14	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	62.6	. .	. . . .	. .
15	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
16	10 26	8.8	7.6	28.0	26.5	36	. .	035	. .	050	. .	35.0	10 29 34.9	53 0	+ 10.7	61 36 6.8	+ 1.2
17	24 20	14.1	11.0	2.0	1.8	34	. .	120	. .	160	. .	35.0	24 23 59.4	. .	+ 26.3	75 30 46.9	+ 2.3
18	342 58	13.3	9.5	24.9	24.0	30	. .	570	. .	610	. .	35.0	343 2 58.5	. .	− 17.6	34 9 2.1	− 0.7
19	57 28	11.0	9.2	25.7	23.6	32	. .	790	. .	850	. .	35.0	57 32 24.3	. .	+ 1 30.6	108 40 16.1	− 1.7
20	3 52	17.2	14.8	2.0	26.6	33	. .	280	. .	290	. .	35.0	3 56 12.2	. .	+ 4.0	55 2 37.4	− 3.9
21	310 12	18.5	16.9	2.9	0.6	32	825	. .	940	. .	990	35.0	310 16 15.8	. .	− 1 7.9	1 21 29.1	− 0.2
22	21 44	21.1	16.2	4.8	0.3	37	490	550	. .	. .	. .	35.0	21 47 3.7	. .	+ 22.8	72 53 47.7	. .
23	22 14	21.9	15.3	3.8	0.5	30	. .	. .	. .	690	705	35.0	22 18 49.7	61.0	+ 22.9	73 25 33.8	. .
24	5 52	16.6	14.6	0.0	25.8	36	. .	380	. .	440	. .	35.0	5 55 25.2	. .	+ 5.9	57 1 52.3	− 0.4
25	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
26	31 26	15.0	12.7	28.2	24.2	34	. .	825	. .	905	. .	35.0	31 30 5.8	67.0	+ 34.6	82 37 1.6	+ 1.6
27	34 34	19.7	13.8	0.2	26.3	34	. .	935	. .	965	. .	39.4	34 37 51.1	. .	+ 39.9	85 44 52.2	−10.8
28	314 46	19.2	13.7	28.4	26.8	39	440	. .	. .	. .	370	39.4	314 48 44.1	55.5	− 58.2	5 54 7.1	+ 4.9
29	314 46	19.2	13.7	28.4	26.8	38	255	. .	. .	. .	220	39.4	314 49 2.0	. .	− 58.1	5 54 25.1	+ 1.1
30	359 50	22.8	20.7	5.4	0.5	33	. .	. .	. .	600	640	39.4	359 54 7.3	. .	− 0.1	51 0 28.4	+ 3.4
31	10 32	19.8	16.0	1.8	26.9	34	. .	880	. .	890	. .	39.4	10 35 51.1	. .	+ 10.8	61 42 23.1	− 6.5
32	307 30	22.2	21.1	3.4	1.5	36	. .	. .	. .	200	215	39.4	307 33 27.1	. .	− 1 15.1	358 38 33.2	+ 2.6
33	49 18	15.2	13.0	28.2	24.0	29	. .	360	. .	380	. .	39.4	49 23 18.8	. .	+ 1 7.4	100 30 47.4	+ 4.2
34	38 46	16.0	12.5	27.7	23.5	32	. .	615	. .	645	. .	39.4	38 50 29.2	. .	+ 46.6	89 57 37.0	+ 3.1
35	46 50	21.5	16.6	1.8	26.8	35	960	. .	. .	. .	000	39.4	46 53 48.8	. .	+ 1 1.8	98 1 11.8	. .
36	46 50	21.5	16.6	1.8	26.8	37	. .	870	. .	860	. .	39.4	46 53 4.7	. .	+ 1 1.8	98 0 27.7	. .
37	348 54	19.5	17.2	1.0	28.3	35	. .	450	. .	465	. .	39.4	348 57 42.2	. .	− 11.3	40 3 52.1	+ 2.6
38	19 48	16.6	14.8	0.9	24.8	34	. .	365	. .	385	. .	39.4	19 52 0.7	54.0	+ 20.9	70 58 42.8	+ 3.3
39	14 18	27.6	24.6	7.6	1.9	29	766	. .	640	. .	510	39.8	14 23 4.8	71.0	+ 14.3	65 29 40.3	. .
40	31 56	25.0	23.9	5.5	0.6	31	. .	846	. .	890	. .	39.8	32 0 32.4	. .	+ 34.9	83 7 28.5	+ 4.0
41	350 18	29.5	24.0	8.0	7.8	34	890	855	. .	. .	. .	39.8	350 21 43.0	. .	− 9.5	41 27 54.7	− 0.8
42	46 56	24.8	20.8	5.1	0.0	34	. .	613	. .	641	. .	39.8	46 59 51.1	. .	+ 1 0.1	98 7 12.4	+ 2.7
43	165 24	26.1	22.5	6.0	2.7	35	458	488	500	508	515	39.8	165 27 36.1	. .	− 14.6	65 38 59.7	+ 0.2
44	153 38	26.5	26.4	6.3	2.1	36	064	098	130	130	184	39.8	153 41 25.6	65.2	− 27.9	77 25 23.5	+ 2.2
45	322 28	27.0	24.3	6.5	3.0	30	770	. .	. .	. .	780	39.8	322 32 47.7	. .	− 43.3	13 38 25.6	+ 2.1
46	3 56	24.4	21.9	6.0	0.0	32	970	004	. .	. .	. .	39.8	4 0 15.9	. .	+ 4.0	55 6 41.1	+ 4.5
47	203 28	12.5	6.0	17.5	15.7	36	240	. .	262	. .	258	39.8	203 31 40.9	. .	+ 24.8	27 34 15.5	− 2.4
48	17 36	24.9	20.6	5.1	28.3	29	524	520	. .	. .	. .	39.8	17 40 54.4	. .	+ 18.2	68 47 33.8	+ 3.1

No.	Barom.	At. Ther.
	in.	°
9	29.94	46.5
11	29.76	62.8
14	29.77	65.0
16	30.03	52.5
23	30.05	60.0
26	30.05	68.0
28	30.10	58.0
38	30.08	56.0
39	29.88	67.0
44	29.90	66.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
10	− 3.3	+ 15 53.2	. .	+ 15 49.9
11	− 3.3	− 15 53.2	. .	− 15 56.5
22	− 3.2	+ 15 53.0	. .	+ 15 49.8
23	− 3.3	− 15 53.0	. .	− 15 56.3
35	− 1.5	− 22.0	. .	− 23.5
36	− 1.5	+ 22.0	. .	+ 20.5
39	−14 15.3	+ 15 53.0	. .	+ 1 37.7

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
May 10	1	B. A. C. 3843	Sk.	5.7	8.3	9.9	16.1	18.1	20.2	26.6	28.2	30.8	10 18.21	− 0.44	. .	−56.81	11 9 20.96	− 1.48
	2	λ Draconis (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	3	β Leonis	Sk.	27.1	29.9	31.5	37.8	39.9	41.9	48.4	49.9	52.5	43 39.88	− 0.44	−56.84	−56.85	11 42 42.59	− 0.03
	4	B. A. C. 4046	Sk.	53.5	56.4	58.6	5.8	8.4	10.9	18.4	20.1	23.4	54 8.39	− 0.41	. .	−56.79	11 53 11.19	− 1.28
	5	B. A. C. 4099	Sk.	55.6	58.3	0.0	6.3	8.4	10.5	16.8	18.5	21.2	5 8.40	− 0.44	. .	−56.79	12 4 11.17	− 1.79
	6	B. A. C. 4124	Sk.	9.0	11.7	13.4	19.6	21.7	23.8	30.0	31.6	34.4	10 21.69	− 0.43	. .	−56.79	12 9 24.47	− 1.46
	7	B. A. C. 4142	Sk.	59.0	2.0	3.8	10.7	13.0	15.5	22.2	24.0	26.9	14 13.01	− 0.43	. .	−56.79	12 13 15.79	− 2.04
	8	B. A. C. 4212	Sk.	12.4	15.0	16.8	23.4	25.6	27.9	34.4	36.0	38.8	24 25.59	− 0.44	. .	−56.79	12 23 28.36	− 1.94
	9	B. A. C. 4235	Sk.	31.4	34.8	36.9	45.0	47.8	50.5	58.8	0.8	4.3	28 47.81	− 0.42	. .	−56.78	12 27 50.61	− 2.48
	10	B. A. C. 4321	Sk.	14.3	17.6	19.7	27.6	30.2	32.7	40.6	42.7	46.0	47 30.16	− 0.40	. .	−56.77	12 46 32.99	− 1.63
	11	12 Canum Venat.	Sk.	. .	. .	. .	. .	13.0	15.6	20.7	22.8	26.2	51 10.32	− 0.42	−56.77	−56.87	12 50 13.03	− 0.10
	12	Lacaille 5410	Sk.	50.4	53.5	55.3	2.5	4.9	7.4	14.9	16.5	19.5	3 4.99	− 0.41	. .	−56.76	13 2 7.82	. .
	13	Polaris, S. P.	Sk.	. .	. .	51.5	22.0	57.0	30.0	. .	. .	. .	12 56.88	− 2.70	. .	−56.88	1 11 57.30	+ 1.08
	14	α Virginis	Sk.	23.4	25.8	27.5	33.6	35.8	37.9	44.0	45.6	48.3	19 35.77	− 0.43	−56.97	−56.88	13 18 38.46	+ 0.07
	15	B. A. C. 166	E.	21.7	24.8	26.5	33.5	36.0	38.2	45.4	47.1	50.1	33 35.92	− 0.40	. .	−57.39	0 32 38.13	+ 0.64
	16	α Cassiopeæ	E.	. .	. .	. .	. .	. .	28.6	35.9	38.5	43.1	34 21.24	− 0.29	. .	−57.24	0 33 23.71	− 0.09
	17	B. A. C. 259	E.	. .	. .	40.8	43.3	46.0	48.6	51.3	. .	. .	50 46.00	− 0.37	. .	−57.39	0 49 48.24	+ 0.90
	18	Venus II, S.	E.	18.6	21.3	22.9	28.9	31.0	33.1	39.1	40.7	43.4	1 31.00	− 0.44	. .	−57.39	1 0 33.17	− 0.45
	19	Venus, N.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	20	B. A. C. 334	E.	26.4	29.3	31.2	38.6	41.2	43.7	51.0	52.9	56.2	3 41.17	− 0.38	. .	−57.39	1 2 43.40	+ 0.86
	21	Polaris	E.	. .	. .	1.0	25.0	50.0	14.5	42.0	. .	. .	12 50.50	+ 6.55	. .	−57.24	1 11 59.81	+ 3.34
	22	β Arietis	E.	28.4	31.0	32.8	39.4	41.5	43.6	50.0	51.8	54.5	48 41.44	− 0.42	−57.40	−57.26	1 47 43.76	+ 0.16
	23	α Arietis	E.	51.6	54.3	56.0	2.6	5.0	7.1	13.7	15.4	18.3	1 4.89	− 0.41	−57.38	−57.26	2 0 7.22	+ 0.13
11	24	Sun I, N.	E.	6.9	9.7	11.2	17.5	19.7	21.8	28.4	30.0	32.7	12 19.77	− 0.42	. .	−57.39	3 11 21.96	. .
	25	Sun II, S.	E.	20.6	23.4	24.9	31.4	33.5	35.6	42.3	43.7	46.6	14 33.56	− 0.42	. .	−57.39	3 13 35.75	. .
	26	ε Leonis	E.	30.6	33.4	35.0	41.8	44.0	46.3	53.0	54.6	57.5	39 44.02	− 0.43	−57.34	−57.36	9 38 46.23	− 0.08
	27	α Leonis	E.	29.2	31.8	33.4	39.6	41.7	43.8	50.0	51.6	54.3	2 41.71	− 0.45	−57.38	−57.36	10 1 43.90	− 0.02
	28	γ^1 Leonis	E.	50.7	53.4	55.0	1.6	3.8	5.9	12.6	14.1	16.9	14 3.78	− 0.44	−57.39	−57.37	10 13 5.97	0.00
	29	ρ Leonis	E.	. .	. .	. .	. .	. .	. .	21.0	22.6	25.1	27 12.70	− 0.45	−57.38	−57.37	10 26 14.88	− 0.06
	30	*l* Leonis	E.	27.6	30.4	31.9	38.1	40.1	42.2	48.6	50.0	52.7	43 40.18	− 0.45	−57.31	−57.37	10 42 42.36	− 0.06
	31	ι Cephei, S. P.	E.	40.6	34.5	30.9	16.0	10.9	6.0	51.3	47.4	41.5	46 11.01	− 0.88	. .	−57.38	22 45 12.75	+ 0.43
	32	α Ursæ Majoris (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	33	α Ursæ Majoris	E.	. .	. .	. .	. .	. .	. .	18.0	21.2	26.8	57 0.24	− 0.27	. .	−57.38	10 56 2.59	− 0.25
	34	B. A. C. 3809	E.	52.2	55.0	56.8	3.6	5.8	8.0	14.9	16.5	19.4	3 5.80	− 0.43	. .	−57.37	11 2 8.00	− 1.61
	35	δ Leonis	E.	13.6	16.4	18.0	24.6	26.9	29.0	35.6	37.1	40.0	8 26.80	− 0.44	−57.28	−57.38	11 7 28.98	− 0.16
	36	B. A. C. 3843	E.	. .	. .	16.5	18.6	20.8	23.0	27.0	28.6	31.4	10 18.66	− 0.44	. .	−57.35	11 9 20.86	− 1.47
	37	B. A. C. 3851	E.	15.6	18.6	20.6	27.6	30.1	32.6	39.7	41.5	44.6	12 30.10	− 0.42	. .	−57.36	11 11 32.32	− 1.81
	38	λ Draconis (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	39	λ Draconis	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	40	γ Cephei, S. P.	E.	51.0	44.0	25.8	17.4	8.0	59.0	50.0	32.2	25.5	35 8.10	− 1.16	. .	−57.39	23 34 9.55	+ 0.86
	41	4 Draconis (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	42	4 Draconis	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	43	B. A. C. 4142	E.	2.5	4.2	8.8	11.2	13.6	16.0	18.3	23.0	24.6	14 13.58	− 0.42	. .	−57.36	12 13 15.80	− 2.03
	44	κ Draconis (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	45	κ Draconis	E.	. .	. .	59.3	5.1	11.5	17.6	23.6	. .	. .	29 11.42	− 0.15	. .	−57.40	12 28 13.87	+ 0.59
	46	32^2 Camelopardalis (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	47	32^1 Camelopardalis	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	32^2 Camelopardalis	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	49	B. A. C. 4433	E.	46.8	50.0	52.2	0.2	3.0	5.6	13.6	15.7	19.3	9 2.93	− 0.39	. .	−57.36	13 8 5.18	− 2.56
	50	Polaris, S. P.	.	40.0	. .	. .	. .	. .	. .	20.0	16.0	28.0	13 4.55	− 6.80	. .	−57.41	1 12 0.34	+ 3.64

38, 40, 42, 46, 50. Bisections at sets B and D.
41. Bisections at wires II and III.
45. Bisections at wires V and VI.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ″	″
1	24 50	10 29.6	25.0	9.6	2.3	33	. .	914	. .	962	. .	39 8	24 53 57.9	. .	+ 26.5	76 0 45.6	− 3.6
2	211 4	11 1.5	26.6	9.8	3.6	36	442	562	662	621	540	39.8	211 7 15.1	58.3	+ 34.5	19 58 31.6	− 4.4
3	23 32	10 25.8	24.7	7.1	1.0	29	. .	608	. .	664	. .	39.8	23 37 5.7	. .	+ 25.0	74 43 51.9	+ 2.8
4	73 24	22.6	18.7	2.5	28.0	35	. .	865	. .	901	. .	39.8	73 27 34.0	. .	+ 3 10.1	124 37 5.3	−18.0
5	21 20	27.5	24.0	8.5	2.3	37	. .	380	. .	390	. .	39.8	21 23 6.2	. .	+ 22.4	72 29 49.8	− 5.4
6	55 40	27.0	21.5	6.2	0.7	36	364	418	. .	. .	. .	39.8	55 43 22.5	. .	+ 1 23.8	106 51 7.5	−14.6
7	9 58	26.1	23.0	6.6	0.7	33	032	048	. .	. .	. .	39.8	10 2 14.0	. .	+ 10.1	61 8 45.3	− 2.7
8	17 14	25.7	23.5	6.5	29.8	33	. .	348	. .	408	. .	39.8	17 8 9.2	. .	+ 17.8	68 24 48.2	− 5.3
9	356 48	25.1	24.0	7.2	0.5	35	. .	841	. .	849	. .	39.8	356 51 31.3	. .	− 3.1	47 57 49.4	− 0.3
10	78 16	28.6	22.7	4.5	0.5	36	. .	380	. .	300	. .	39.8	78 19 23.3	. .	+ 4 30.1	129 30 14.6	−18.8
11	359 50	20.2	17.9	2.5	26.3	33	. .	. .	. .	940	988	39.8	359 54 5.4	. .	− 0.1	51 0 26.5	+ 2.1
12	71 36	24.0	20.0	4.5	29.0	29	. .	665	. .	925	. .	39.8	71 41 5.8	. .	+ 2 51.5	122 50 18.5	−17.9
13	307 30	28.0	25.8	6.5	3.5	36	064	. .	072	. .	020	39.8	307 33 25.8	. .	− 1 14.5	358 38 32.5	+ 2.5
14	49 18	23.8	19.5	3.6	27.3	29	. .	000	. .	092	. .	39.8	49 23 18.2	57.5	+ 1 6.8	100 30 46.2	+ 3.0
15	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
16	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
17	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
18	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
19	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
20	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
21	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
22	18 38	24.5	21.5	8.0	3.9	36	. .	065	. .	115	. .	44.8	18 41 32.2	. .	+ 19.0	69 48 12.4	− 0.1
23	15 58	25.3	21.7	7.5	2.3	37	. .	535	. .	560	. .	44.8	16 1 10.2	. .	+ 16.1	67 7 47.5	+ 2.3
24	20 38	28.6	17.3	11.7	4.8	29	260	280	. .	. .	. .	44.8	20 43 14.9	73.8	+ 21.1	71 49 57.2	. .
25	21 10	11 6.5	23.4	16.8	14.0	30	. .	. .	. .	085	160	44.8	21 14 56.0	. .	+ 21.7	72 21 38.9	. .
26	14 28	11 2.5	22.0	12.5	11.0	32	. .	195	. .	250	. .	44.3	14 32 25.8	. .	+ 14.5	65 39 1.5	+ 2.1
27	26 14	11 1.0	20.0	11.3	8.1	31	. .	645	. .	685	. .	44.3	26 18 36.2	. .	+ 27.7	77 25 25.1	+ 3.8
28	18 20	10 26.5	17.4	7.0	1.2	30	. .	575	. .	605	. .	44.3	18 24 57.3	69.0	+ 18.7	69 31 37.2	+ 2.7
29	28 52	11 3.3	22.2	12.8	7.8	32	. .	. .	. .	890	920	44.3	28 56 16.1	. .	+ 31.0	80 3 8.3	+ 2.9
30	27 36	10 23.0	12.5	3.5	27.4	31	. .	165	. .	175	. .	44.3	27 40 52.3	. .	+ 29.5	78 47 43.0	+ 2.8
31	284 26	28.0	18.7	6.7	3.2	36	. .	065	. .	955	. .	44.3	284 29 32.3	. .	− 3 33.6	335 32 19.9	+ 2.0
32	203 28	23.3	11.5	2.7	25.8	35	735	700	. .	. .	. .	44.3	203 31 42.0	. .	+ 24.5	27 34 14.7	− 3.1
33	336 24	26.9	17.7	6.0	1.2	32	. .	. .	. .	880	930	44.3	336 28 23.1	. .	− 24.5	27 34 19.8	+ 2.0
34	13 30	21.5	11.6	3.8	28.2	37	. .	200	. .	255	. .	44.3	13 33 20.0	. .	+ 13.6	64 39 54.8	+ 0.6
35	17 36	19.4	14.4	5.1	28.3	30	. .	925	. .	025	. .	44.3	17 40 55.1	. .	+ 18.0	68 47 34.3	+ 3.7
36	24 50	26.7	16.5	7.0	0.0	34	. .	. .	. .	570	590	44.3	24 53 57.0	. .	+ 26.1	76 0 44.3	− 3.5
37	6 36	20.3	12.5	3.5	26.0	36	. .	. .	. .	230	280	44.3	6 39 36.0	. .	+ 6.6	57 46 3.8	+ 2.2
38	211 4	11 1.5	21.0	9.8	4.7	36	. .	. .	940	. .	010	44.3	211 7 15.6	. .	+ 34.0	19 58 31.6	− 4.2
39	328 48	10 20.3	10.1	1.5	26.8	31	. .	. .	. .	580	655	44.3	328 52 49.1	. .	− 34.0	19 58 36.3	+ 0.5
40	295 48	10 29.8	20.3	8.0	6.8	36	200	. .	. .	. .	270	44.3	295 51 27.2	. .	− 1 55.7	346 55 52.7	+ 1.3
41	219 20	11 2.0	20.0	9.3	4.0	32	450	470	. .	. .	. .	44.3	219 24 24.1	. .	+ 46.4	11 41 10.7	− 2.6
42	320 32	10 23.2	15.2	7.3	1.6	35	. .	. .	670	. .	690	44.3	320 35 39.4	. .	− 46.4	11 41 14.2	+ 0.9
43	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
44	211 30	11 0.8	20.1	9.1	3.5	31	840	920	. .	. .	. .	44.3	211 34 32.8	. .	+ 34.8	19 31 13.6	− 3.2
45	328 22	10 25.4	14.5	4.8	29.3	36	. .	. .	. .	310	350	44.3	328 25 31.8	. .	− 34.8	19 31 18.2	+ 1.4
46	225 6	27.5	14.3	4.5	28.5	30	210	. .	280	. .	. .	44.3	225 11 3.8	. .	+ 57.0	5 54 20.4	− 2.8
47	314 46	27.5	16.3	5.0	1.3	39	. .	. .	. .	685	715	44.3	314 48 43.6	. .	− 57.0	5 54 7.8	+ 5.8
48	314 46	27.5	16.3	5.0	1.3	38	. .	. .	. .	400	495	44.3	314 49 2.8	. .	− 57.0	5 54 27.0	+ 3.8
49	358 0	21.3	9.8	4.1	27.3	31	. .	155	. .	205	. .	44.3	358 4 52.6	. .	− 1.9	49 11 11.9	− 3.5
50	307 30	25.3	17.9	5.8	2.5	36	. .	. .	. .	630	560	44.3	307 33 27.6	. .	− 1 13.6	358 38 35.2	+ 5.4

No.	Barom.	At. Ther.
	in.	°
2	29.94	62.5
14	30.00	60.0
16	30.14	64.5
24	30.12	70.5
28	30.00	70.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
24	− 3.1	+ 15 50.8	. .	+ 15 47.8
25	− 3.2	− 15 50.8	. .	− 15 54.0

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
May 11	1	B. A. C. 4462	E.	2.4	4.9	6.5	10.6	12.7	14.8	. .	. .	. .	15 14.73	− 0.45	. .	−57.35	13 14 16.93	− 1.89
	2	B. A. C. 4467	E.	. .	. .	40.2	43.0	45.7	48.5	53.7	55.6	59.0	15 42.92	− 0.39	. .	−57.35	13 14 45.18	− 2.57
	3	Jupiter I, S.	E.	7.4	10.0	11.6	. .	. .	. .	28.0	29.5	32.2	31 19.78	− 0.46	. .	−57.35	13 30 21.97	. .
	4	Jupiter II, N.	E.	. .	. .	18.7	20.8	22.9	24.9	27.0	. .	. .	31 22.86	− 0.46	. .	−57.35	13 30 25.05	. .
	5	B. A. C. 4575	E.	37.4	40.0	41.8	48.5	50.7	53.0	59.6	1.1	4.0	38 50.68	− 0.43	. .	−57.35	13 37 52.90	− 2.18
	6	α Bootis	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	7	Anonymous	E.	. .	. .	. .	. .	40.5	42.6	44.7	. .	. .	23 40.41	− 0.47	. .	−57.35	14 22 42.59	− 2.00
	8	5 Ursæ Minoris	E.	. .	. .	35.6	44.6	52.9	1.4	10.0	. .	. .	28 52.90	+ 0.02	. .	−57.43	14 27 55.49	− 0.46
	9	ε Bootis	E.	18.0	20.8	22.6	29.4	31.6	33.9	40.9	42.6	45.6	40 31.71	− 0.42	−57.27	−57.44	14 39 33.85	− 0.19
	10	α² Libræ	E.	45.0	47.9	49.4	53.7	55.7	57.8	0.0	2.0	. .	44 57.85	− 0.46	−57.43	−57.44	14 43 59.95	− 0.02
12	11	Moon I, N.	F.	31.3	34.2	35.7	42.1	44.4	46.6	53.0	54.6	57.2	13 44.34	− 0.41	. .	−57.76	10 12 46.17	+65.99
	12	B. A. C. 3575	F.	49.5	52.2	53.7	0.0	2.0	4.0	10.3	11.8	14.5	22 2.00	− 0.42	. .	−57.76	10 21 3.82	− 1.15
	13	B. A. C. 3622	F.	15.5	19.6	23.6	25.8	27.8	29.9	32.0	36.2	40.2	29 27.84	− 0.42	. .	−57.76	10 28 29.66	− 1.17
	14	l Leonis	F.	28.0	30.7	32.2	38.4	40.5	42.6	48.8	50.4	53.0	43 40.51	− 0.42	−57.68	−57.72	10 42 42.37	− 0.04
	15	B. A. C. 3763	F.	4.3	7.3	9.3	16.5	19.0	21.5	28.6	30.4	33.5	54 18.93	− 0.46	. .	−57.76	10 53 20.71	− 0.86
	16	B. A. C. 3809	F.	52.7	55.5	57.4	4.0	6.3	8.5	15.3	17.0	19.9	3 6.29	− 0.39	. .	−57.76	11 2 8.14	− 1.60
	17	δ Leonis	F.	14.0	16.7	18.4	24.9	27.1	29.4	35.9	37.6	40.4	8 27.16	− 0.40	−57.69	−57.73	11 7 29.03	− 0.10
	18	B. A. C. 3843	F.	. .	. .	. .	. .	21.0	23.3	27.5	29.0	31.7	10 19.02	− 0.41	. .	−57.76	11 9 20.85	− 1.46
	19	B. A. C. 3851	F.	16.0	19.0	20.9	28.1	30.5	33.0	40.2	42.0	45.0	12 30.52	− 0.38	. .	−57.76	11 11 32.38	− 1.79
	20	δ Crateris	F.	52.4	54.9	56.6	2.9	4.9	7.0	13.3	14.9	17.6	14 4.94	− 0.45	−57.79	−57.73	11 13 6.76	+ 0.04
	21	τ Leonis	F.	17.8	20.4	21.9	28.0	30.0	32.1	38.2	39.8	42.3	22 30.06	− 0.43	−57.71	−57.73	11 21 31.90	− 0.04
	22	B. A. C. 3945	F.	8.0	11.0	12.9	20.0	22.6	25.0	32.3	33.9	37.0	31 22.52	− 0.46	. .	−57.76	11 30 24.30	− 1.11
	23	β Leonis	F.	28.1	30.8	32.4	38.7	40.8	42.9	49.3	50.9	53.4	43 40.81	− 0.41	−57.81	−57.74	11 42 42.66	+ 0.05
	24	Groom. 4163, S. P.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	25	4 Draconis (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	26	12 Canum Venat.	F.	55.5	58.8	0.7	8.5	11.1	13.8	21.9	23.7	27.0	51 11.22	− 0.35	−57.75	−57.75	12 50 13.12	0.00
	27	B. A. C. 4367	F.	. .	. .	53.0	55.2	57.3	59.3	1.4	. .	. .	56 57.24	− 0.42	. .	−57.76	12 55 59.06	− 1.89
	28	Lacaille 5410	F.	. .	. .	1.0	3.4	5.9	8.3	10.7	. .	. .	3 5.86	− 0.46	. .	−57.76	13 2 7.64	− 1.69
	29	Polaris, S. P.	F.	. .	. .	. .	. .	4.0	35.0	8.0	18.0	16.0	13 2.82	− 7.74	. .	−57.76	1 11 57.32	+ 0.14
	30	B. A. C. 4462	F.	2.9	5.5	7.0	13.0	15.1	17.2	23.0	24.7	27.4	15 15.09	− 0.43	. .	−57.76	13 14 16.90	− 1.89
	31	Jupiter I, N.	F.	44.8	47.2	48.9	. .	. .	. .	5.4	7.0	9.5	30 57.13	− 0.44	. .	−57.76	13 29 58.93	. .
	32	Jupiter II, S.	F.	. .	. .	56.0	58.1	0.2	2.3	4.4	. .	. .	31 0.20	− 0.44	. .	−57.76	13 30 2.00	. .
	33	α Bootis	F.	44.8	47.7	49.2	55.8	58.0	0.1	6.6	8.2	11.0	10 57.93	− 0.40	−57.76	−57.77	14 9 59.76	− 0.01
	34	ε Bootis	F.	18.5	21.3	23.0	29.9	32.1	34.4	41.5	43.0	45.9	40 32.18	− 0.38	−57.77	−57.78	14 39 34.02	− 0.02
	35	β Ceti	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	36	Polaris	Sk.	13.0	55.0	3.0	57.0	25.0	45.0	. .	. .	. .	12 48.14	+ 8.03	. .	−57.73	1 11 58.44	+ 1.02
13	37	Sun I, N.	Sk.	57.7	0.5	2.0	8.5	10.6	12.8	19.2	20.9	23.6	20 10.64	− 0.39	. .	−57.86	3 19 12.39	. .
	38	Sun II, S.	Sk.	11.7	14.3	16.0	22.5	24.6	26.8	33.3	34.8	37.6	22 24.62	− 0.30	. .	−57.86	3 21 26.37	. .
	39	α Tauri	Sk.	29.8	32.6	34.0	40.4	42.6	44.8	51.0	52.7	55.4	29 42.59	− 0.40	−57.78	−57.78	4 28 44.41	− 0.02
	40	β Orionis	Sk.	17.4	20.0	21.4	27.7	29.7	31.8	37.9	39.4	41.9	9 29.69	− 0.46	−57.87	−57.79	5 8 31.44	+ 0.08
	41	β Tauri	Sk.	7.0	10.0	11.9	16.6	21.3	26.0	30.5	32.1	35.9	19 21.26	− 0.37	−57.93	−57.79	5 18 23.10	+ 0.12
	42	δ Orionis	Sk.	. .	. .	31.0	33.0	35.0	37.1	39.1	. .	. .	26 35.04	− 0.43	−57.77	−57.79	5 29 36.82	− 0.05
	43	Moon I, N.	Sk.	34.5	37.2	38.7	45.0	47.0	49.2	55.6	57.0	59.8	1 47.11	− 0.47	. .	−57.84	11 0 48.80	+63.61
	44	δ Crateris	Sk.	52.6	55.0	56.8	3.0	5.0	7.2	13.5	15.0	17.7	14 5.09	− 0.50	−57.90	−57.88	11 13 6.71	0.00
	45	B. A. C. 3930	Sk.	45.6	48.0	49.6	55.8	57.8	0.0	6.0	7.6	10.0	28 57.82	− 0.48	. .	−57.84	11 27 59.50	− 1.42
	46	β Leonis	Sk.	28.1	30.8	32.4	38.7	40.8	43.0	49.4	51.0	53.5	43 40.86	− 0.46	−57.82	−57.88	11 42 42.52	− 0.08
	47	o Virginis	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	B. A. C. 4092	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	49	B. A. C. 4113	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .

7. Wire A used.
8. Bisections at set C.
24, 43. Bisections at sets B and D.
25. Bisections at wires C_5 and D_1.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	33 20	10 24.0	13.5	3.5	27.7	33	700	720	. .	. .	. .	44.3	33 24 12.5	. .	+ 37.4	84 31 11.1	−11.5
2	358 0	11 0.6	20.8	9.2	3.7	28	. .	. .	. .	890	925	44.3	358 5 20.7	. .	− 1.9	49 11 40.0	− 4.0
3	46 40	10 25.7	14.7	5.5	28.8	29	965	. .	. .	. .	025	44.3	46 45 8.0	. .	+ 1 0.3	97 52 29.5	. .
4	46 40	25.7	14.7	5.5	28.8	32	. .	865	. .	935	. .	44.3	46 44 23.6	62.0	+ 1 0.3	97 51 45.1	. .
5	15 30	27.2	18.1	8.8	1.9	35	. .	605	. .	615	. .	44.3	15 33 39.5	. .	+ 15.8	66 40 16.5	− 9.0
6	19 0	25.3	11.5	5.5	28.8	36	. .	490	. .	500	. .	44.3	19 3 29.6	. .	+ 19.6	70 10 10.4	+ 2.5
7	59 6	28.7	18.4	9.1	2.7	36	. .	. .	. .	030	. .	44.3	59 12 5.2	. .	+ 1 35.0	110 20 1.4	−16.0
8	322 36	11 2.5	22.3	11.1	6.5	36	445	. .	. .	. .	490	44.3	322 39 22.1	. .	− 43.3	13 45 0.0	− 0.5
9	11 14	10 27.0	18.1	8.2	0.9	36	. .	070	. .	080	. .	44.3	11 17 32.8	. .	+ 11.3	62 24 5.3	+ 2.3
10	54 20	10 28.5	16.8	7.5	1.1	34	760	790	. .	. .	. .	44.3	54 23 52.2	61.5	+ 1 19.2	105 31 32.6	+ 2.5
11	23 54	11 1.5	21.1	10.1	4.7	37	. .	848	590	186	. .	44.0	23 57 6.7	. .	+ 25.0	75 3 52.9	. .
12	28 26	11 4.9	24.3	10.4	9.2	36	. .	684	. .	698	. .	44.0	28 29 16.8	67.0	+ 30.6	79 36 8.6	− 2.4
13	29 32	10 25.8	15.0	4.7	29.6	36	594	606	. .	. .	. .	44.0	29 35 26.3	. .	+ 32.0	80 42 19.5	− 3.1
14	27 36	24.1	13.7	2.2	27.6	31	. .	094	. .	110	. .	44.0	27 40 52.7	. .	+ 29.6	78 47 43.5	+ 3.4
15	71 50	27.2	15.9	4.6	1.2	30	. .	134	. .	202	. .	44.0	71 55 3.9	. .	+ 2 51.2	123 4 16.3	−16.7
16	13 30	23.7	13.2	4.7	29.2	37	. .	098	. .	096	. .	44.0	13 33 20.2	. .	+ 13.7	64 39 55.1	+ 0.7
17	17 36	26.3	15.2	5.4	29.0	30	970	976	. .	. .	. .	44.0	17 40 52.4	. .	+ 18.1	68 47 31.7	+ 1.2
18	24 50	25.5	14.9	3.7	29.3	34	. .	. .	. .	722	738	44.0	24 53 56.1	. .	+ 26.3	76 0 43.6	− 3.4
19	6 36	11 3.2	22.9	11.8	9.0	35	. .	. .	. .	552	572	44.0	6 39 35.2	. .	+ 6.6	57 46 3.0	+ 2.4
20	52 56	10 29.2	18.4	8.3	2.7	39	. .	. .	. .	042	048	44.0	52 58 46.0	. .	+ 1 15.1	104 6 22.3	+ 2.2
21	35 16	25.2	13.7	3.3	28.9	32	. .	. .	. .	794	792	44.0	35 20 26.2	. .	+ 40.2	86 27 27.6	+ 0.8
22	71 40	24.2	15.2	1.6	1.9	35	. .	300	. .	324	. .	44.0	71 43 46.6	. .	+ 2 50.3	122 52 58.1	−17.5
23	23 32	22.7	12.6	2.0	0.5	30	. .	200	. .	210	. .	44.0	23 37 6.4	63.0	+ 24.9	74 43 52.5	+ 3.6
24	292 34	29.0	18.5	7.5	11.2	31	768	746	. .	. .	. .	44.0	292 38 35.2	. .	− 2 15.6	343 42 40.8	+ 1.3
25	219 20	26.0	13.4	0.4	0.8	32	. .	. .	. .	890	892	44.0	219 24 24.5	. .	+ 46.8	11 41 9.9	− 3.3
26	359 50	22.0	13.0	0.7	28.7	34	. .	210	. .	226	. .	44.0	359 54 6.0	. .	− 0.1	51 0 27.1	+ 3.1
27	27 12	26.5	14.7	29.5	4.3	36	. .	. .	. .	612	620	44.0	27 15 26.8	. .	+ 29.5	78 22 17.5	− 9.3
28	71 36	23.3	12.7	23.5	2.1	30	. .	130	. .	160	. .	44.0	71 41 8.6	. .	+ 2 51.1	122 50 20.9	−18.1
29	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
30	33 20	24.0	13.9	27.8	1.8	33	. .	740	. .	746	. .	44.0	33 24 12.3	. .	+ 37.8	84 31 11.3	−11.4
31	46 38	26.6	14.7	29.2	3.2	33	106	914	. .	. .	. .	44.0	46 42 21.5	. .	+ 1 0.8	97 49 43.5	. .
32	46 38	26.6	14.7	29.2	3.2	30	. .	. .	. .	250	246	44.0	46 43 4.5	58.8	+ 1 0.8	97 50 26.5	. .
33	19 0	29.5	19.4	7.0	7.5	36	. .	. .	. .	116	134	44.0	19 3 29.8	. .	+ 19.9	70 10 10.9	+ 3.2
34	11 14	11 2.9	23.5	11.7	8.3	35	776	778	. .	. .	. .	44.0	11 17 31.3	56.6	+ 11.5	62 24 4.0	+ 1.2
35	57 28	10 23.0	17.0	5.0	3.5	32	. .	699	. .	723	. .	42.8	57 32 24.0	62.0	+ 1 29.8	108 40 15.0	− 1.3
36	310 12	11 3.4	27.2	12.5	14.6	32	500	. .	. .	560	600	42.8	310 16 17.0	. .	− 1 7.7	1 21 30.5	0.0
37	20 8	10 23.5	15.0	6.9	0.0	30	183	280	. .	. .	. .	42.8	20 13 2.4	. .	+ 20.9	71 19 44.5	. .
38	20 40	10 26.4	17.4	7.3	2.0	31	. .	. .	. .	330	510	42.8	20 44 43.6	68.1	+ 21.5	71 51 26.3	. .
39	22 34	11 2.5	25.0	13.0	10.7	34	. .	578	. .	590	. .	42.8	22 37 47.3	. .	+ 23.6	73 44 32.1	+ 1.4
40	47 10	10 28.0	17.4	6.7	3.2	36	. .	234	. .	295	. .	42.8	47 13 28.0	. .	+ 1 0.9	98 20 50.1	+ 2.2
41	10 20	22.3	14.7	5.0	0.1	36	. .	. .	. .	958	970	42.8	10 23 21.2	. .	+ 10.3	61 29 52.7	+ 0.4
42	39 12	24.4	14.7	4.0	0.1	32	. .	630	. .	692	. .	42.8	39 16 26.2	70.6	+ 46.1	90 23 33.5	+ 1.2
43	29 38	28.2	18.5	6.3	2.5	31	194	. .	015	. .	775	43.9	29 42 34.4	. .	+ 32.0	80 49 27.6	. .
44	52 56	25.0	15.4	4.5	29.6	39	. .	. .	. .	374	364	43.9	52 58 44.5	. .	+ 1 14.4	104 6 20.1	+ 0.1
45	35 4	21.0	10.9	0.6	25.1	35	. .	180	. .	218	. .	43.9	35 7 52.4	62.3	+ 40.3	86 14 53.9	− 7.6
46	23 32	22.5	15.5	4.2	29.4	30	. .	156	. .	230	. .	43.9	23 37 5.6	. .	+ 25.1	74 43 51.9	+ 3.1
47	29 24	20.8	13.0	1.3	27.6	36	112	120	. .	. .	. .	43.9	29 27 36.8	. .	+ 32.4	80 34 30.4	+ 2.4
48	79 18	23.0	15.0	1.9	28.5	37	748	800	. .	. .	. .	43.9	79 21 9.5	. .	+ 4 55.7	130 32 26.4	−19.4
49	77 0	26.8	18.2	4.4	2.3	34	650	690	. .	. .	. .	43.9	77 3 53.7	. .	+ 4 4.6	128 14 19.5	−19.0

No.	Barom.	At. Ther.
	in.	°
10	29.94	63.5
12	29.99	67.5
25	30.08	64.8
32	30.06	61.0
34	30.08	60.0
35	30.22	60.8
38	30.25	66.4
42	30.24	70.6
45	30.21	63.8

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
3	− 1.5	− 22.2	. .	− 23.7
4	− 1.5	+ 22.2	. .	+ 20.7
11	−22 42.4	+ 15 18.7	. .	− 7 23.7
31	− 1.4	+ 21.5	. .	+ 20.1
32	− 1.4	− 21.5	. .	− 22.9
37	− 3.0	+ 15 50.9	. .	+ 15 47.9
38	− 3.0	− 15 50.9	. .	− 15 53.9
43	−27 24.4	+ 15 12.1	. .	− 12 12.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. May. 13	1	B. A. C. 4210 . .	Sk.	0.3	3.8	5.6	13.9	16.7	19.3	27.5	29.2	32.7	24 16.56	− 0.53	. .	−57.84	12 23 18.19	− 1.45
	2	B. A. C. 4227 . .	Sk.	29.7	33.0	35.2	43.1	45.8	48.6	56.7	58.9	2.2	27 45.91	− 0.53	. .	−57.84	12 26 47.54	− 1.47
	3	B. A. C. 4355 . .	Sk.	28.0	31.0	32.9	39.9	42.6	45.0	52.3	54.0	57.1	54 42.53	− 0.52	. .	−57.84	12 53 44.17	− 1.64
	4	B. A. C. 4374 . .	Sk.	. .	. .	. .	. .	48.8	51.5	57.0	59.0	2.5	58 46.23	− 0.53	. .	−57.84	12 57 47.86	− 1.69
	5	Polaris, S. P. . .	Sk.	. .	. .	52.0	30.0	3.0	37.0	12.0	19.5	17.0	13 3.69	− 6.80	. .	−57.91	1 11 58.89	+ 1.23
	6	α Virginis . . .	Sk.	24.2	26.8	28.5	34.6	36.7	38.9	45.0	46.7	49.3	19 36.74	− 0.50	−57.87	−57.91	13 18 38.33	− 0.06
	7	Jupiter I, N. . .	Sk.	22.5	25.0	26.7	. .	. .	. .	43.1	44.5	47.3	30 34.85	− 0.49	. .	−57.84	13 29 36.52	. .
	8	Jupiter II, S. . .	Sk.	. .	. .	33.7	35.7	37.7	39.8	42.0	. .	. .	30 37.66	− 0.40	. .	−57.84	13 29 39.33	. .
	9	B. A. C. 4601 . .	Sk.	45.0	48.5	50.5	58.3	1.3	4.0	12.0	14.2	17.6	43 1.27	− 0.53	. .	−57.83	13 42 2 91	− 1.97
	10	η Bootis	Sk.	31.5	34.0	35.7	42.1	44.4	46.5	53.1	54.6	57.3	49 44.36	− 0.45	−57.80	−57.93	13 48 45.98	− 0.18
14	11	β Ceti.	E.	5.2	7.9	9.5	16.0	18.3	20.7	26.7	28.3	31.0	38 18.18	− 0.41	−58.89	−58.79	0 37 18.98	+ 0.15
	12	B. A. C. 334 . .	E.	27.5	30.6	32.6	40.2	. .	45.2	52.6	54.3	57.5	3 42.56	− 0.30	. .	−58.79	1 2 43.47	+ 0.75
	13	Polaris	E.	. .	. .	54.0	18.5	50.0	13.5	46.0	. .	. .	12 48.20	+ 8.50	. .	−58.79	1 11 57.91	− 0.54
	14	Venus II, N. . .	E.	3.2	5.8	7.3	13.5	15.5	17.6	23.6	25.4	28.0	19 15.54	− 0.38	. .	−58.79	1 18 16.37	− 0.44
	15	Venus, S. . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	16	β Arietis	E.	. .	. .	38.4	40.6	42.8	45.0	47.1	. .	. .	48 42.78	− 0.35	−58.74	−58.80	1 47 43.63	− 0.04
	17	α Arietis	E.	. .	. .	. .	6.1	8.5	10.9	15.2	16.8	19.6	1 6.28	− 0.34	−58.76	−58.81	2 0 7.13	− 0.04
15	18	Sun I, S . . .	E.	51.0	53.6	55.3	1.8	4.0	6.1	12.6	14.4	17.0	28 3.98	− 0.35	. .	−58.82	3 27 4.81	. .
	19	Sun II, N. . . .	E.	5.4	8.0	9.6	16.0	18.3	20.4	27.0	28.6	31.4	30 18.30	− 0.35	. .	−58.82	3 29 19.13	. .
16	20	Polaris	F.	. .	. .	52.0	18.0	46.0	12.0	38.0	. .	. .	12 45.20	+15.70	. .	−59.38	1 12 1.58	+ 1.88
17	21	Sun I, S. . . .	F.	46.6	49.2	50.8	57.3	59.4	1.6	8.2	9.7	12.6	35 59.49	− 0.39	. .	−59.40	3 34 59.70	. .
	22	Sun II, N. . . .	F.	1.0	4.0	5.5	12.1	14.3	16.4	23.0	24.5	27.3	38 14.23	− 0.39	. .	−59.40	3 37 14.44	. .
	23	α Tauri	F.	31.4	34.2	35.9	42.0	44.2	46.4	52.8	54.4	57.1	29 44.27	− 0.41	−59.43	−59.44	4 28 44.42	− 0.03
	24	α Aurigæ . . .	F.	8.7	12.2	14.4	23.3	26.3	29.3	37.9	40.0	43.6	8 26.19	− 0.15	. .	−59.46	5 7 26.58	− 0.08
	25	β Orionis . . .	F.	. .	. .	27.2	29.4	31.4	33.5	35.4	. .	. .	9 31.38	− 0.54	−59.48	−59.46	5 8 31.38	+ 0.02
	26	β Tauri	F.	8.8	11.6	13.2	. .	. .	. .	32.0	33.6	36.7	19 22.65	− 0.32	−59.37	−59.46	5 18 22.87	− 0.11
	27	δ Orionis . . .	F.	. .	. .	32.8	34.7	36.8	38.9	40.9	. .	. .	26 36.82	− 0.50	−59.47	−59.46	5 25 36.86	− 0.02
	28	B. A. C. 2061 . .	F.	. .	. .	. .	. .	. .	. .	19.9	21.8	24.2	18 11.42	− 0.59	. .	−59.46	6 17 11.37	+ 0.45
	29	Polaris, S. P. . .	F.	. .	. .	. .	42.0	16.0	50.0	25.0	30.0	. .	13 16.02	−13.89	. .	−59.62	1 12 2.51	+ 2.45
	30	B. A. C. 4462 . .	F.	. .	. .	13.0	15.0	17.0	19.0	21.1	. .	. .	15 17.02	− 0.56	. .	−59.64	13 14 16.82	− 1.88
	31	α Virginis . . .	F.	26.1	28.8	30.3	36.6	38.6	40.8	47.0	48.5	51.0	19 38.63	− 0.63	−59.64	−59.62	13 18 38.38	0.00
	32	B. A. C. 4518 . .	F.	31.0	34.6	36.7	44.4	47.0	49.6	57.7	59.6	3.0	26 47.07	− 0.77	. .	−59.65	13 25 46.65	− 1.85
	33	B. A. C. 4522 . .	F.	17.5	21.0	23.0	30.9	33.5	36.0	44.0	46.0	49.6	27 33.50	− 0.77	. .	−59.65	13 26 33.08	− 1.86
	34	Jupiter, S. . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	35	Jupiter, N . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	36	η Bootis	F.	33.2	36.0	37.6	44.0	46.1	48.3	54.9	56.4	59.2	49 46.19	− 0.49	−59.60	−59.63	13 48 46.07	− 0.08
	37	B. A. C. 4674 . .	F.	34.6	37.6	39.4	46.7	49.1	51.5	58.5	0.4	3.5	56 49.03	− 0.72	. .	−59.66	13 55 48.65	− 1.96
	38	Moon I, N. . .	F.	22.2	24.6	26.4	32.8	35.0	37.2	43.6	45.1	47.9	59 34.98	− 0.63	. .	−59.66	13 58 34.69	+62.72
	39	α Bootis	F.	49.5	51.2	55.6	57.8	59.9	2.0	4.2	8.6	10.2	10 59.89	− 0.49	−59.63	−59.64	14 9 59.76	− 0.01
	40	ε Bootis	F.	20.3	23.0	24.9	31.8	33.9	36.4	43.5	45.0	47.9	40 34.08	− 0.44	−59.60	−59.65	14 39 33.99	− 0.07
	41	α^2 Libræ	F.	47.7	50.5	51.9	58.3	0.5	2.6	9.0	10.5	13.0	45 0.44	− 0.65	−59.79	−59.65	14 44 0.14	+ 0.13
	42	Polaris	Sk.	. .	. .	. .	. .	46.0	15.0	. .	. .	. .	12 47.26	. .	. .	. .	. . . .	. .
18	43	α Bootis	Sk.	47.2	50.0	51.7	58.0	0.3	2.5	9.0	10.6	13.3	11 0.29	− 0.48	−60.04	−60.17	14 9 59.64	− 0.13
	44	5 Ursæ Minoris. .	Sk.	. .	. .	. .	46.0	55.0	3.8	29.6	35.7	46.8	28 55.01	+ 0.68	. .	−60.18	14 27 55.51	− 0.24
	45	ε Bootis	Sk.	21.0	24.0	25.6	32.5	34.7	37.0	44.0	45.7	48.5	40 34.78	− 0.43	−60.31	−60.18	14 39 34.17	+ 0.11
	46	B. A. C. 334 . .	E.	29.6	32.9	34.7	42.0	44.7	47.3	54.7	56.4	59.7	3 44.67	− 0.34	. .	−60.75	1 2 43.58	+ 0.64
	47	Polaris	E.	. .	. .	58.0	22.0	48.0	13.0	39.0	. .	. .	12 48.00	+15.68	. .	−60.66	1 12 3.02	+ 1.84
	48	Venus II, S. . .	E.	56.6	59.1	0.7	7.0	9.0	11.0	17.4	18.7	21.6	37 9.01	− 0.63	. .	−60.76	1 36 7.72	− 0.43
	49	Venus, N. . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .

34. Telescope micrometer reading decreased one revolution in reduction.
38. Bisections at wires B_1, C_3, and D_3.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	79 48	10 23.8	14.7	1.1	29.0	36	694	734	. .	. .	. .	43.9	79 51 25.6	. .	+ 5 10.3	131 2 57.1	−19.5
2	79 28	23.8	14.8	1.1	29.0	32	. .	978	. .	180	. .	43.9	79 32 21.8	. .	+ 5 1.4	130 43 44.4	−19.5
3	71 36	20.9	13.6	2.5	28.0	31	. .	560	. .	610	. .	43.9	71 40 45.6	. .	+ 2 52.2	122 49 59.0	−18.2
4	79 16	24.5	16.6	3.0	29.8	32	. .	. .	. .	360	490	43.9	79 20 30.6	. .	+ 4 56.9	130 31 48.7	−19.2
5	307 30	27.8	18.5	5.2	4.4	36	. .	480	. .	480	. .	43.9	307 33 25.6	. .	− 1 15.0	358 38 31.8	+ 2.4
6	49 18	21.8	12.5	1.5	26.9	29	. .	. .	. .	648	545	43.9	49 23 17.1	. .	+ 1 7.3	100 30 45.6	+ 2.4
7	46 36	21.5	11.6	29.7	24.6	33	. .	532	. .	566	. .	43.9	46 40 17.6	. .	+ 1 1.2	97 47 40.0	. .
8	46 36	21.5	11.6	29.7	24.6	30	640	. .	. .	. .	734	43.9	46 41 1.4	. .	+ 1 1.2	97 48 23.8	. .
9	79 48	21.9	14.0	0.2	28.1	32	212	230	. .	. .	. .	43.9	79 52 35.5	. .	+ 5 12.9	131 4 9.6	−18.5
10	19 48	23.0	16.4	5.0	29.0	34	. .	520	. .	532	. .	43.9	19 51 58.8	56.1	+ 20.9	70 58 40.9	+ 2.3
11	57 28	26.8	17.7	7.0	4.1	32	. .	. .	. .	380	400	43.5	57 32 28.1	69.0	+ 1 28.2	108 40 17.5	+ 1.6
12	3 52	23.7	16.0	5.2	1.0	33	. .	485	. .	500	. .	43.5	3 56 13.7	. .	+ 3.9	55 2 38.8	− 4.0
13	310 12	28.8	21.0	7.6	7.1	32	970	. .	915	. .	. .	43.5	310 16 17.4	. .	− 1 6.1	1 21 32.5	+ 1.5
14	32 32	24.1	15.6	5.1	1.3	37	480	. .	. .	. .	600	43.5	32 35 11.6	. .	+ 35.8	83 42 8.6	. .
15	32 32	24.1	15.6	5.1	1.3	36	. .	685	. .	695	. .	43.5	32 35 24.5	. .	+ 35.8	83 42 21.5	. .
16	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . . .	. .	. .	. . . . .	. .
17	15 58	25.0	16.4	6.4	1.5	37	. .	. .	. .	500	605	43.5	16 1 11.0	73.0	+ 16.0	67 7 48.2	+ 3.1
18	20 12	27.4	15.8	7.0	4.3	34	940	925	. .	. .	. .	43.5	20 15 48.8	. .	+ 20.5	71 22 30.5	. .
19	19 40	26.6	14.9	5.9	2.0	33	. .	. .	. .	770	770	43.5	19 44 9.2	75.5	+ 19.9	70 50 50.3	. .
20	310 12	24.8	16.2	4.1	9.2	32	864	782	778	808	798	40.3	310 16 18.9	58.5	− 1 8.3	1 21 31.8	+ 0.3
21	19 44	23.5	15.5	5.8	4.1	33	424	432	. .	. .	. .	40.3	19 48 10.1	. .	+ 20.7	70 54 52.0	. .
22	19 12	27.2	17.8	7.1	5.0	32	. .	. .	. .	140	144	40.3	19 16 28.9	62.3	+ 20.1	70 23 10.2	. .
23	22 34	16.5	7.2	26.8	26.4	35	. .	570	. .	570	. .	40.3	22 37 45.8	. .	+ 23.8	73 44 30.8	+ 0.2
24	352 58	11 0.1	20.0	9.3	12.3	35	. .	735	. .	780	. .	40.3	353 1 29.5	. .	− 7.0	44 7 43.7	+ 0.3
25	47 10	10 14.5	4.6	23.8	23.8	37	. .	. .	. .	284	294	40.3	47 13 22.2	. .	+ 1 1.6	98 20 45.0	− 2.3
26	10 30	24.4	14.8	5.9	3.6	36	. .	685	. .	700	. .	40.3	10 23 20.8	65.6	+ 10.5	61 29 52.5	+ 0.1
27	39 12	25.8	15.3	4.7	3.3	32	. .	. .	. .	596	. .	40.3	39 16 23.5	. .	+ 46.6	90 23 31.3	− 0.6
28	56 42	24.4	13.4	4.3	0.7	34	. .	. .	. .	574	580	40.3	56 45 54.6	. .	+ 1 26.4	107 53 42.2	+ 0.3
29	307 30	26.4	15.5	3.3	5.1	36	. .	. .	660	688	. .	42.5	307 33 22.6	. .	− 1 15.6	358 38 28.2	− 0.2
30	33 20	24.1	12.9	2.2	0.7	33	. .	. .	. .	816	836	42.5	33 24 9.2	. .	+ 38.4	84 31 8.8	−11.0
31	49 18	18.2	8.7	25.8	25.6	29	. .	. . .	. .	818	814	42.5	49 23 15.9	. .	+ 1 7.8	100 30 44.9	+ 1.7
32	78 4	22.2	11.0	29.4	29.2	30	. .	240	. .	. .	. .	42.5	78 9 5.2	. .	+ 4 31.0	129 19 57.4	−19.3
33	78 4	22.2	11.0	29.4	29.2	35	. .	. .	. .	814	. .	42.5	78 7 40.4	. .	+ 4 30.5	129 18 32.1	−19.2
34	46 30	27.5	17.5	6.3	5.3	37	. .	. .	. .	146	. .	42.5	46 33 29.4	53.2	+ 1 1.5	97 40 52.1	. .
35	46 30	27.5	17.5	6.3	5.3	38	. .	. .	. .	936	. .	42.5	46 32 46.6	. .	+ 1 1.5	97 40 9.3	. .
36	19 48	25.9	17.0	6.5	4.0	34	. .	. .	. .	304	300	42.5	19 51 58.7	. .	+ 21.1	70 58 41.0	+ 3.0
37	69 52	25.4	13.1	2.6	1.4	33	. .	. .	. .	440	448	42.5	69 56 14.0	. .	+ 2 38.8	121 5 14.0	−17.8
38	52 58	28.0	17.2	6.7	4.2	34	010	. .	772	. .	694	42.5	53 2 4.8	51.2	+ 1 17.6	104 9 43.6	. .
39	19 0	27.7	17.6	7.3	6.3	36	. .	064	. .	074	. .	42.5	19 3 29.9	. .	+ 20.2	70 10 11.3	+ 4.4
40	11 14	25.5	16.2	5.6	3.2	36	. .	152	. .	164	. .	42.5	11 17 30.7	. .	+ 11.7	62 24 3.6	+ 1.8
41	54 20	25.4	15.4	4.5	3.0	34	. .	964	. .	970	. .	42.5	54 23 49.2	48.8	+ 1 22.0	105 31 32.4	+ 2.2
42	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . . .	. .	. .	. . . . .	. .
43	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . . .	. .	. .	. . . . .	. .
44	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . . .	51.2	. .	. . . . .	. .
45	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . . .	. .	. .	. . . . .	. .
46	3 52	20.0	14.0	2.9	29.0	33	600	625	. .	640	690	41.0	3 56 11.6	. .	+ 3.9	55 2 36.7	− 4.0
47	310 12	22.3	15.3	3.3	3.5	33	. .	030	. .	985	. .	41.0	310 16 18.9	61.2	− 1 7.5	1 21 32.6	+ 0.7
48	30 46	18.6	11.8	0.5	28.8	32	820	. .	. .	. .	010	41.0	30 50 24.0	. .	+ 34.1	81 57 19.3	. .
49	30 46	18.6	11.8	0.5	28.8	33	. .	680	. .	730	. .	41.0	30 50 11.8	. .	+ 34.1	81 57 7.1	. .

No.	Barom.	At. Ther.
	in.	°
10	30.20	58.6
11	30.06	65.0
19	30.06	72.5
20	30.34	56.0
22	30.32	61.0
26	30.28	65.5
34	30.21	57.0
38	30.20	56.0
41	30.21	55.0
44	30.15	54.0
47	30.14	57.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
7	− 1.4	+ 21.9	. .	+ 20.5
8	− 1.4	− 21.9	. .	− 23.3
14	− 3.6	+ 6.5	. .	+ 2.9
15	− 3.6	− 6.5	+ 0.1	− 10.0
18	− 3.0	− 15 50.1	. .	− 15 53.1
19	− 3.0	+ 15 50.1	. .	+ 15 47.1
21	− 2.9	− 15 50.9	. .	− 15 53.8
22	− 2.9	+ 15 50.9	. .	+ 15 48.0
34	− 1.4	− 21.4	. .	− 22.8
35	− 1.4	+ 21.4	. .	+ 20.0
38	−43 3.7	+ 14 46.1	. .	− 28 17.6
48	− 3.4	− 6.3	+ 0.4	− 9.3
49	− 3.4	+ 6.3	. .	+ 2.9

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. May 18	1	β Arietis	E.	31.8	34.6	36.3	42.8	45.0	47.2	53.7	55.3	58.0	49 44.97	− 0.46	−60.73	−60.67	1 47 43.84	+ 0.08
	2	α Arietis	E.	. .	. .	4.0	6.3	8.5	10.7	13.0	. .	. .	1 8.50	− 0.44	−60.80	−60.68	2 0 7.38	+ 0.13
19	3	Sun I, S. . . .	E.	44.8	47.5	49.0	55.5	57.6	0.0	6.5	8.2	11.0	43 57.79	− 0.46	. .	−60.79	3 42 56.54	. .
	4	Sun II, N. . . .	E.	59.8	2.4	4.0	10.6	12.8	15.0	21.5	23.0	25.8	46 12.77	− 0.46	. .	−60.79	3 45 11.52	. .
	5	Mercury I, S. . .	E.	. .	. .	38.6	41.0	43.1	45.3	47.5	. .	. .	35 43.10	− 0.43	. .	−60.80	4 34 41.87	+ 0.20
	6	Mercury, N. . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	7	Polaris, S. P. . .	E.	. .	. .	. .	. .	21.0	52.0	28.0	34.0	32.0	13 19.94	−15.54	. .	−60.96	1 12 3.44	+ 1.88
	8	B. A. C. 4467 . .	E.	30.3	33.6	35.7	43.9	46.6	49.1	57.4	59.3	2.8	15 46.52	− 0.36	. .	−60.94	13 14 45.22	− 2.51
	9	α Virginis . . .	E.	27.5	30.1	31.7	37.9	40.0	42.0	48.4	49.8	52.5	19 39.99	− 0.66	−60.97	−60.96	13 18 38.37	− 0.01
	10	Jupiter I, S. . .	E.	20.5	23.0	24.6	. .	. .	. .	41.2	42.7	45.4	28 32.90	− 0.65	. .	−60.95	13 27 31.30	. .
	11	Jupiter II, N. . .	E.	. .	. .	32.0	34.0	36.0	38.0	40.2	. .	. .	28 36.04	− 0.65	. .	−60.95	13 27 34.44	. .
	12	B. A. C. 4624 . .	E.	40.8	43.5	45.0	49.8	52.3	54.6	57.0	59.3	. .	45 54.68	− 0.76	. .	−60.95	13 44 52.97	− 1.91
	13	B. A. C. 4629 . .	E.	. .	. .	. .	. .	. .	. .	. .	16.0	19.0	47 4.74	− 0.76	. .	−60.95	13 46 3.03	− 1.92
	14	η Bootis	E.	34.6	37.1	38.8	45.3	47.5	49.7	56.2	57.8	0.6	49 47.51	− 0.51	−60.90	−60.97	13 48 46.03	− 0.12
	15	β Ursæ Minoris . .	E.	25.7	35.5	41.0	4.4	12.0	19.9	42.8	47.9	58.2	52 11.93	+ 0.58	. .	−61.00	14 51 11.51	− 0.14
	16	β Bootis	E.	2.0	5.5	7.5	15.5	18.3	21.0	29.0	31.0	34.4	58 18.24	− 0.36	. .	−61.00	14 57 16.88	− 0.03
	17	β Libræ	E.	8.2	10.9	12.5	18.7	20.8	22.8	29.0	30.5	33.1	11 20.72	− 0.65	−61.00	−61.01	15 10 19.06	− 0.01
	18	μ^1 Bootis	E.	34.6	37.9	39.8	47.5	50.0	52.7	0.4	2.3	5.5	20 50.08	− 0.38	−60.99	−61.01	15 19 48.69	− 0.03
	19	γ^2 Ursæ Minoris . .	E.	. .	. .	49.0	55.6	2.5	9.0	15.6	. .	. .	22 2.34	+ 0.40	. .	−61.01	15 21 1.73	− 0.17
	20	α Coronæ Borealis .	E.	13.7	16.6	18.3	25.2	27.5	29.8	36.7	38.5	41.3	30 27.51	− 0.46	−60.94	−61.01	15 29 26.04	− 0.07
	21	Moon I, S. . . .	E.	1.5	4.2	6.0	12.6	15.0	17.4	24.1	25.7	28.6	35 15.01	− 0.72	. .	−60.98	15 34 13.31	+66.15
21	22	Polaris	Sk.	. .	. .	. .	. .	55.0	. .	. .	45.0	45.0	12 57.21	+10.78	. .	−62.22	1 12 5.77	+ 2.30
22	23	Sun I, N. . . .	Sk.	46.0	48.7	50.2	57.0	58.9	1.1	7.7	9.5	12.2	56 59.03	− 0.43	. .	−62.35	3 55 56.25	. .
	24	Sun II, S. . . .	Sk.	1.3	4.0	5.6	12.0	14.3	16.5	23.2	24.6	27.6	59 14.34	− 0.43	. .	−62.35	3 58 11.56	. .
	25	γ Geminorum . .	Sk.	20.4	23.0	24.7	31.0	33.0	35.2	41.5	43.2	45.9	31 33.10	− 0.44	−62.38	−62.34	6 30 29.32	+ 0.01
	26	δ Ursæ Minoris . .	Sk.	23.0	6.5	34.5	. .	. .	. .	. .	. .	. .	13 50.84	+ 4.28	. .	−62.50	18 12 52.62	− 0.35
	27	Moon II . . .	Sk.	15.3	18.4	20.2	27.3	29.7	32.2	39.2	41.0	44.2	20 29.72	− 0.52	. .	−62.49	18 19 26.71	−70.37
	28	α Lyræ	Sk.	31.2	34.5	36.5	44.4	47.0	49.6	57.5	59.3	2.6	33 46.96	− 0.26	−62.49	−62.51	18 32 44.19	− 0.10
	29	51 Cephei, S. P. . .	Sk.	. .	. .	. .	. .	. .	. .	24.5	52.5	58.0	42 13.63	− 6.43	. .	−62.51	6 41 4.69	+ 1.89
	30	β Lyræ	Sk.	17.8	20.9	22.8	30.0	32.4	34.9	42.3	44.1	47.3	46 32.50	− 0.29	−62 48	−62.51	18 45 29.70	0.00
	31	ζ Aquilæ	Sk.	32.0	34.7	36.3	42.4	44.5	46.7	53.0	54.5	57.0	0 44.57	− 0.39	−62.51	−62.51	18 59 41.67	+ 0.08
25	32	Polaris	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	13 2.15	+ 8.31	. .	−63.24	1 12 7.22	+ 1.10
26	33	Sun I, N. . . .	Sk.	53.3	56.1	57.8	4.3	6.6	8.8	15.3	16.9	19.7	12 6.53	− 0.29	. .	−63.26	4 11 3.08	. .
	34	Sun II, S. . . .	Sk.	9.2	12.0	13.6	20.3	22.4	24.7	31.2	32.9	35.6	14 22.43	− 0.29	. .	−63.26	4 13 18.88	. .
	35	λ Ursæ Minoris . .	Sk.	. .	. .	45.0	29.0	18.0	5.0	57.5	. .	. .	50 18.90	+13.05	. .	−63.32	19 49 28.63	− 3.26
	36	α Cygni	Sk.	57.6	1.2	3.3	11.8	14.7	17.7	26.4	28.5	32.0	38 14.80	− 0.06	−63.34	−63.32	20 37 11.42	+ 0.04
	37	ζ Cygni	Sk.	27.4	30.5	32.0	39.2	41.6	44.0	50.9	52.7	55.7	8 41.56	− 0.15	−63.36	−63.33	21 7 38.08	+ 0.04
	38	ε Pegasi	Sk.	58.0	57.6	59.2	5.4	7.5	9.5	15.7	17.3	19.8	39 7.44	− 0.23	−63.27	−63.33	21 38 3.88	− 0.05
	39	Moon II, N. . .	Sk.	23.8	26.6	28.0	34.7	36.9	39.0	45.6	47.3	49.9	59 36.87	− 0.30	. .	−63.40	21 58 33.17	−67.03
	40	Polaris	E.	. .	. .	. .	. .	. .	. .	47.0	50.0	38.0	13 1.45	+11.79	. .	−63.45	1 12 9.79	+ 3.04
27	41	Sun I, N. . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	42	Sun II, S. . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	43	Mercury I, S. . .	E.	12.4	15.4	17.0	24.0	26.2	28.5	35.4	36.9	39.9	40 26.19	− 0.24	. .	−63.51	5 39 22.44	+ 0.23
	44	Mercury, N. . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	45	μ Geminorum . .	E.	14.0	17.0	18.7	25.1	27.4	29.6	36.2	37.9	40.7	16 27.40	− 0.25	−63.48	−63.48	6 15 23.67	− 0.04
	46	γ Geminorum . .	E.	20.2	22.9	24.5	30.9	33.0	35.0	41.5	43.0	45.9	31 32.99	− 0.27	−63.46	−63.48	6 30 29.24	− 0.05
	47	α Canis Majoris . .	E.	28.9	31.5	33.0	39.6	41.7	43.8	50.2	52.0	54.5	40 41.69	− 0.34	−63.57	−63.48	6 39 37.87	+ 0.01
	48	α Ursæ Majoris (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	49	α Ursæ Majoris . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .

7. Bisections at wires C_5 and D_2.
21. Wire A used.
21, 39. Bisections at wires B_1, C_3, and D_3.
32. The mean of four transits over R. A. micrometer wire.
41. Telescope micrometer reading decreased five revolutions in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
2	15 58	10 18.8	11.0	1.1	27.7	37	. .	810	. .	900	. .	41.0	16 1 8.6	. .	+ 16.4	67 7 46.2	+ 1.3
3	19 18	22.3	13.8	4.2	2.4	34	960	920	. .	. .	. .	41.0	19 21 49.2	66.5	+ 19.9	70 28 30.3	. .
4	18 46	22.8	13.2	3.4	1.6	33	. .	. .	. .	720	690	41.0	18 50 9.7	. .	+ 19.3	69 56 50.2	. .
5	15 8	22.3	13.5	3.0	1.5	35	770	. .	. .	. .	020	41.0	15 11 35.9	. .	+ 15.3	66 18 12.4	. .
6	15 8	22.3	13.5	3.0	1.5	36	. .	110	. .	220	. .	41.0	15 11 31.6	. .	+ 15.3	66 18 8.1	. .
7	307 30	22.0	15.1	3.5	1.7	36	. .	. .	. .	730	650	43.3	307 33 24.0	. .	− 1 14.9	358 38 30.3	+ 2.3
8	358 0	22.7	17.5	4.5	0.8	29	130	180	. .	. .	. .	43.3	358 5 20.2	. .	− 1.9	49 11 39.5	− 2.4
9	49 18	24.0	15.5	3.3	29.3	29	. .	350	. .	365	. .	43.3	49 23 17.5	56.0	+ 1 7.2	100 30 45.9	+ 2.7
10	46 26	18.0	15.3	3.0	28.5	34	065	. .	. .	. .	. .	43.3	46 30 6.7	. .	+ 1 0.8	97 37 28.7	. .
11	46 26	18.0	15.3	3.0	28.5	36	. .	940	. .	850	. .	43.3	46 29 23.9	. .	+ 1 0.8	97 36 45.9	. .
12	69 48	25.0	13.6	3.3	0.5	37	. .	265	. .	250	. .	43.3	69 51 16.3	. .	+ 2 36.2	121 0 13.7	−18.2
13	70 6	25.5	15.5	4.6	3.1	34	. .	. .	. .	725	800	43.3	70 9 53.1	. .	+ 2 38.8	121 18 53.1	−18.2
14	19 48	27.8	21.0	10.2	5.0	34	. .	125	. .	180	. .	43.3	19 51 58.8	. .	+ 20.9	70 58 40.9	+ 3.2
15	324 10	26.1	17.3	4.8	4.3	32	. .	455	. .	440	. .	43.3	324 14 28.8	. .	− 41.7	15 20 8.3	+ 0.7
16	357 56	25.3	16.8	5.5	2.5	31	. .	180	. .	200	. .	43.3	358 0 47.7	. .	− 2.0	49 7 6.9	+ 2.1
17	47 44	23.5	13.6	0.5	0.2	34	. .	090	. .	140	. .	43.3	47 48 5.7	. .	+ 1 3.8	98 55 30.7	+ 4.3
18	1 0	21.2	13.2	1.5	1.0	31	120	140	. .	. .	. .	43.3	1 4 52.8	. .	+ 1.1	52 11 15.1	+ 4.3
19	326 34	15.2	6.5	22.3	25.8	35	. .	980	. .	945	. .	43.3	326 37 45.5	. .	− 38.0	17 43 28.7	+ 5.0
20	11 42	27.3	18.0	5.5	7.0	36	. .	145	. .	195	. .	43.3	11 45 29.4	. .	+ 12.0	62 52 2.6	+ 2.7
21	62 32	25.7	14.2	3.2	3.7	37	690	. .	540	. .	325	43.3	62 37 44.3	54.5	+ 1 51.4	113 45 56.9	. .
22	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
23	18 10	28.3	28.7	6.2	6.1	37	162	112	. .	. .	. .	44.5	18 13 12.5	. .	+ 17.9	69 19 51.6	. .
24	18 42	28.8	29.8	7.6	7.5	38	. .	. .	. .	512	600	44.5	18 44 50.8	86.2	+ 18.4	69 51 30.4	. .
25	22 18	11 4.3	4.3	14.0	11.6	29	882	864	. .	. .	. .	44.5	22 22 57.6	. .	+ 22.3	73 29 41.1	+ 3.4
26	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
27	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
28	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
29	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
30	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
31	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
32	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
33	17 24	10 22.7	26.7	3.3	2.4	31	058	032	. .	. .	. .	45.4	17 28 50.2	. .	+ 17.2	68 35 28.6	. .
34	17 56	29.5	2.5	3.8	7.4	32	. .	. .	. .	219	315	45.4	18 0 28.1	82.4	+ 17.7	69 7 7.0	. .
35	309 54	23.5	28.3	3.2	4.8	29	290	. .	246	. .	220	47.2	309 59 18.9	62.0	− 1 8.0	1 4 32.1	+ 2.8
36	354 0	29.4	0.1	5.6	8.5	34	. .	130	. .	168	. .	47.2	354 4 0.5	. .	− 5.9	45 10 15.8	+ 2.3
37	9 6	27.0	27.5	3.0	5.1	31	. .	130	. .	210	. .	47.2	9 10 48.7	. .	+ 9.3	60 17 19.2	+ 0.4
38	29 30	26.6	26.4	3.0	5.0	30	. .	280	. .	310	. .	47.2	29 35 2.4	. .	+ 32.6	80 41 56.2	+ 0.7
39	56 2	29.5	26.0	3.4	5.1	37	670	. .	806	. .	986	47.2	56 5 6.3	59.6	+ 1 25.2	107 12 52.7	. .
40	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
41	17 14	9 23.7	18.5	14.8	2.4	36	595	660	. .	. .	. .	30.4	17 18 40.2	. .	+ 17.3	68 25 18.7	. .
42	17 46	10 0.3	25.4	16.8	8.8	32	. .	. .	. .	860	870	30.4	17 50 16.8	. .	+ 17.9	68 56 55.9	. .
43	13 14	9 26.4	22.0	19.4	6.0	30	065	. .	. .	. .	210	30.4	13 19 0.1	80.5	+ 13.1	64 25 34.4	. .
44	13 14	26.4	22.0	19.4	6.0	30	. .	435	. .	490	. .	30.4	13 18 54.9	. .	+ 13.1	64 25 29.2	. .
45	16 14	28.7	25.7	23.2	8.2	31	025	045	. .	. .	. .	30.4	16 18 42.9	. .	+ 16.2	67 25 20.3	+ 1.4
46	22 18	27.7	23.5	19.5	7.5	30	. .	210	. .	230	. .	30.4	22 22 57.5	. .	+ 22.8	73 29 41.5	+ 3.9
47	55 20	21.8	20.1	17.0	5.5	29	. .	935	. .	965	. .	30.4	55 25 4.9	. .	+ 1 20.0	106 32 46.1	− 0.8
48	203 28	25.8	23.5	17.0	4.3	35	130	188	. .	. .	. .	29.7	203 31 41.7	. .	+ 24.3	27 34 15.2	− 1.3
49	336 24	24.0	23.3	15.3	4.5	32	. .	. .	. .	790	870	29.7	336 28 20.9	. .	− 24.3	27 34 17.8	+ 1.3

No.	Barom.	At. Ther.
	in.	°
3	30.11	63.8
9	30.10	59.0
21	30.09	56.5
24	30.05	82.8
34	29.93	80.4
35	30.12	66.0
39	30.15	62.8
43	30.28	80.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
3	− 2.9	− 15 50.0	. .	− 15 52.9
4	− 2.8	+ 15 50.0	. .	+ 15 47.2
5	− 1.9	− 2.2	. .	− 4.1
6	− 1.9	+ 2.2	− 0.1	+ 0.2
10	− 1.4	− 21.4	. .	− 22.8
11	− 1.4	+ 21.4	. .	+ 20.0
21	−47 48.2	− 14 44.3	. .	−1 2 32.5
23	− 2.8	+ 15 49.4	. .	+ 15 46.6
24	− 2.8	− 15 49.4	. .	− 15 52.2
33	− 2.6	+ 15 49.2	. .	+ 15 46.6
34	− 2.6	− 15 49.2	. .	− 15 51.8
39	−46 57.9	+ 15 30.1	. .	− 31 27.8
41	− 2.6	+ 15 48.6	. .	+ 15 46.0
42	− 2.6	− 15 48.6	. .	− 15 51.2
43	− 1.9	− 2.6	. .	− 4.5
44	− 1.9	+ 2.6	0.0	+ 0.7

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
May 27	1	δ Leonis	E.	19.4	22.2	23.9	30.4	32.6	34.8	41.4	43.0	45.7	8 32.60	— 0.27	—63.43	—63.50	11 7 28.83	— 0.13
	2	B. A. C. 3851 . .	E.	21.5	24.5	26.4	33.6	36.0	38.4	45.5	47.4	50.5	12 35.98	— 0.23	. .	—63.46	11 11 32.29	— 1.60
	3	τ Leonis	E.	23.3	25.9	27.5	33.5	35.6	37.6	43.7	45.2	47.9	22 35.58	— 0.32	—63.48	—63.50	11 21 31.76	— 0.04
	4	λ Draconis . . .	E.	35.9	40.5	52.4	58.3	4.3	10.4	16.4	28.4	32.8	25 4.38	+ 0.26	. .	—63.50	11 24 1.14	+ 0.07
	5	B. A. C. 3930 . .	E.	50.9	53.5	55.0	1.0	3.0	5.1	11.3	12.8	15.5	29 3.12	— 0.32	. .	—63.46	11 27 59.34	— 1.29
	6	γ Cephei, S. P. . .	E.	. .	. .	33.9	24.8	16.0	7.0	57.7	. .	. .	35 15.88	— 1.55	. .	—63.50	23 34 10.83	+ 0.32
	7	β Leonis	E.	33.5	36.2	37.7	44.0	46.2	48.3	54.7	56.3	58.9	43 46.20	— 0.29	—63.46	—63.50	11 42 42.41	— 0.06
	8	γ Ursæ Majoris . .	E.	59.8	4.0	6.9	17.4	20.9	24.4	34.9	37.5	41.9	48 20.86	— 0.06	. .	—63.50	11 47 17.30	— 0.04
	9	Groom. 4163, S. P.	E.	. .	. .	3.3	56.0	48.7	41.4	34.0	. .	. .	49 48.68	— 1.27	. .	—63.50	23 48 43.91	+ 0.24
	10	η Virginis . . .	E.	23.8	26.3	37.8	34.0	36.0	38.0	44.0	45.6	48.3	14 35.98	— 0.33	—63.48	—63.50	12 13 32.15	— 0.04
	11	B. A. C. 4211 . .	E.	16.5	19.0	20.7	27.0	29.1	31.4	37.6	39.4	42.0	24 29.19	— 0.36	. .	—63.46	12 23 25.37	— 1.43
	12	β Corvi	E.	41.5	44.3	45.9	50.4	52.5	54.7	57.0	59.3	. .	28 54.78	— 0.36	—63.61	—63.50	12 27 50.92	+ 0.07
	13	κ Draconis . . .	E.	. .	. .	. .	. .	. .	. .	40.2	44.7	52.4	29 15.65	+ 0.27	. .	—63.50	12 28 12.42	— 0.18
	14	21 Cassiopeæ, S. P. .	E.	. .	. .	42.4	35.3	27.0	19.7	12.0	. .	. .	38 27.28	— 1.27	. .	—63.50	0 37 22.51	+ 0.40
	15	32^1 Camelopardalis .	E.	. .	45.6	0.1	. .	. .	. .	. .	. .	. .	49 19.80	+ 1.94	. .	—63.45	12 48 18.39	—12.80
	16	32^2 Camelopardalis .	E.	28.7	53.4	7.6	. .	. .	. .	. .	. .	. .	49 27.64	+ 1.94	. .	—63.50	12 48 26.08	— 0.55
	17	12 Canum Venat. .	E.	0.8	4.0	6.0	14.0	16.6	19.2	27.2	29.2	32.5	51 16.61	— 0.19	—63.47	—63.50	12 50 12.92	— 0.03
	18	B. A. C. 4367 . .	E.	50.4	52.9	54.5	0.7	2.8	4.9	11.0	12.6	15.3	57 2.79	— 0.30	. .	—63.45	12 55 59.04	— 1.82
	19	Polaris, S. P. . .	E.	. .	. .	. .	23.0	57.5	32.5	40.0	38.0	47.0	13 24.61	—11.00	. .	—63.51	1 12 10.10	+ 3.02
	20	B. A. C. 4467 . .	E.	32.6	36.0	38.0	46.0	48.7	51.5	59.5	1.5	5.0	15 48.76	— 0.18	. .	—63.45	13 14 45.13	— 2.43
	21	α Virginis . . .	E.	29.8	32.3	33.9	40.0	42.1	44.3	50.5	52.0	54.6	19 42.17	— 0.34	—63.49	—63.51	13 18 38.32	— 0.04
	22	Jupiter I, S. . .	E.	6.5	9.0	10.6	. .	. .	. .	27.0	28.6	31.1	26 18.80	— 0.34	. .	—63.45	13 25 15.01	. .
	23	Jupiter II, N. . .	E.	. .	. .	17.6	19.7	21.8	23.8	26.0	. .	. .	26 21.78	— 0.34	. .	—63.45	13 25 17.99	. .
	24	ζ Virginis . . .	E.	12.9	15.5	17.0	23.0	25.0	27.1	33.3	34.8	37.4	29 25.11	— 0.33	—63.43	—63.51	13 28 21.27	— 0.08
	25	η Ursæ Majoris. .	E.	24.0	28.0	30.5	39.9	43.0	46.4	55.8	58.1	2.2	43 43.10	— 0.11	. .	—63.51	13 42 39.48	— 0.24
	26	η Bootis	E.	36.8	39.6	41.2	47.6	49.7	51.9	58.5	0.1	2.8	49 49.80	— 0.28	—63.44	—63.51	13 48 46.01	— 0.12
	27	Moon II . . .	E.	11.1	13.8	15.4	21.7	23.9	26.0	32.4	34.0	36.6	50 23.88	— 0.35	. .	—63.56	22 49 19.97	—66.32
	28	α Pegasi	E.	24.0	26.7	28.2	34.5	36.6	38.8	45.0	46.7	49.3	59 36.64	— 0.35	—63.55	—63.55	22 58 32.74	+ 0.03
	29	α Andromedæ . .	E.	45.7	48.6	50.3	57.5	59.8	2.0	8.9	10.7	13.6	2 59.68	— 0.31	—63.56	—63.56	0 1 55.81	+ 0.02
	30	γ Pegasi	E.	39.6	42.2	43.9	50.0	52.2	54.4	0.6	2.2	4.9	7 52.22	— 0.35	—63.60	—63.56	0 6 48.31	+ 0.04
	31	Venus II, N. . .	F.	. .	. .	. .	. .	. .	. .	11.6	13.2	15.8	17 3.23	— 0.42	. .	— 3.61	2 16 59.20	— 0.42
	32	α Ceti.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	33	α Persei	F.	8.4	12.4	14.6	23.9	27.1	30.2	39.6	42.0	46.0	15 27.13	— 0.21	. .	— 3.54	3 15 23.38	+ 0.10
	34	δ Persei	F.	47.0	50.6	52.9	1.8	5.1	8.0	17.0	19.3	23.3	34 5.00	— 0.23	. .	— 3.54	3 34 1.23	+ 0.46
28	35	Sun I, S. . . .	F.	0.3	3.0	4.7	11.4	13.7	15.7	22.2	23.7	26.1	19 13.42	— 0.38	. .	— 3.62	4 19 9.42	. .
	36	Sun II	F.	16.6	19.3	20.9	27.4	29.7	32.0	38.6	40.0	43.2	21 29.74	— 0.38	. .	— 3.62	4 21 25.74	. .
	37	β Orionis	F.	23.3	25.8	27.3	33.4	35.5	37.5	43.8	45.3	48.0	8 35.54	— 0.47	— 3.67	— 3.56	5 8 31.51	+ 0.11
	38	α Leporis . . .	F.	. .	. .	. .	. .	. .	21.0	25.2	26.9	29.6	27 16.69	— 0.49	— 3.67	— 3.56	5 27 12.64	+ 0.07
	39	ε Orionis	F.	43.7	46.0	47.8	53.7	55.9	57.9	4.0	5.5	8.1	29 55.84	— 0.45	— 3.52	— 3.56	5 29 51.83	— 0.05
	40	Mercury I . . .	F.	28.7	31.3	33.0	39.9	42.3	44.5	51.3	53.0	56.0	46 42.22	— 0.36	. .	— 3.62	5 46 38.24	+ 0.24
	41	α Orionis. . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	42	μ Geminorum . .	F.	. .	. .	23.0	25.4	27.5	29.8	32.0	. .	. .	15 27.54	— 0.38	— 3.48	— 3.57	6 15 23.59	— 0.13
	43	γ Geminorum . .	F.	20.5	23.2	24.6	31.0	33.2	35.5	41.7	43.0	46.0	30 33.19	— 0.40	— 3.52	— 3.57	6 30 29.22	— 0.08
	44	α Canis Majoris. .	F.	29.0	32.0	33.4	39.8	42.0	44.0	50.4	51.9	54.7	39 41.91	— 0.48	— 3.66	— 3.58	6 39 37.85	0.00
	45	B. A. C. 4113 . .	F.	45.0	48.4	50.2	58.0	0.6	3.3	11.0	13.0	16.3	7 0.64	— 0.53	. .	— 3.65	12 6 56.46	— 1.16
	46	B. A. C. 4210 . .	F.	. .	16.7	19.5	22.1	24.8	27.6	33.0	35.0	38.5	23 22.17	— 0.54	. .	— 3.65	12 23 17.96	— 1.29
	47	κ Draconis . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	21 Cassiopeæ, S. P. .	F.	13.0	3.2	57.5	35.4	27.0	19.6	57.3	52.0	42.5	37 27.50	— 1.65	. .	— 3.65	0 37 22.20	+ 0.01
	49	32^2 Camelopardalis (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	50	B. A. C. 4374 . .	F.	35.7	39.1	41.1	49.2	52.0	54.7	2.7	4.5	8.0	57 51.89	— 0.54	. .	— 3.65	12 57 47.70	— 1.58

4, 48, 49. Bisections at sets B and D.
6, 14. Bisections at set C.
15, 16. Bisections at wires II and III.
19. Bisections at wires C_5, D_1, and D_3.
20. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	17 36	9 24.6	22.0	18.6	4.5	30	675	675	. .	695	745	29.7	17 40 51.8	75.0	+ 17.8	68 47 30.8	+ 1.5
2	6 36	26.5	24.5	21.5	7.0	35	615	625	. .	670	685	29.7	6 39 33.6	. .	+ 6.5	57 46 1.3	+ 3.7
3	35 16	22.4	17.7	15.0	2.0	32	570	580	. .	610	630	29.7	35 20 25.6	. .	+ 39.7	86 27 26.5	+ 0.5
4	328 48	24.7	20.7	15.8	5.2	31	080	. .	. .	. .	140	29.7	328 52 46.3	. .	− 33.8	19 58 33.7	− 0.5
5	35 4	22.2	17.3	13.8	1.7	34	. .	855	. .	875	. .	29.7	35 7 51.4	. .	+ 39.4	86 14 52.0	− 6.8
6	295 48	26.0	24.1	18.0	8.3	36	210	. .	. .	. .	180	29.7	295 51 25.7	. .	− 1 55.0	346 55 51.9	+ 1.3
7	23 32	27.5	25.0	21.5	8.3	29	700	710	. .	735	750	29.7	23 37 3.5	. .	+ 24.5	74 43 49.2	+ 1.5
8	344 26	26.0	24.5	17.7	7.5	32	. .	410	. .	440	. .	29.7	344 30 24.1	. .	− 15.6	35 36 29.7	+ 0.8
9	292 34	27.2	23.8	18.7	8.3	31	. .	700	. .	730	. .	29.7	292 38 32.8	. .	− 2 13.9	343 42 40.1	+ 1.5
10	38 48	29.3	22.0	19.5	6.8	36	. .	415	. .	460	. .	29.7	38 51 21.7	. .	+ 45.3	89 54 28.2	+ 0.1
11	54 38	25.8	20.6	18.8	4.7	34	. .	800	. .	860	. .	29.7	54 41 48.2	. .	+ 1 19.3	105 49 28.7	−14.9
12	61 30	28.0	22.5	19.2	8.3	31	930	955	. .	. .	. .	29.7	61 34 29.9	. .	+ 1 43.5	112 42 34.6	+ 0.6
13	328 22	27.5	24.0	18.2	7.8	36	. .	. .	. .	110	225	29.7	328 25 27.7	. .	− 34.6	19 31 14.3	+ 0.3
14	293 10	10 0.4	26.0	20.2	10.6	34	020	. .	. .	. .	960	29.7	293 13 56.7	. .	− 2 10.4	344 18 7.5	+ 3.9
15	314 46	9 27.1	22.8	16.4	8.5	39	670	675	. .	. .	. .	29.7	314 48 34.7	. .	− 56.7	5 53 59.2	+ 8.6
16	314 46	27.1	22.8	16.4	8.5	38	380	335	. .	. .	. .	29.7	314 48 54.8	. .	− 56.7	5 54 18.3	− 2.1
17	359 50	29.0	26.2	22.2	8.8	33	635	665	. .	. .	. .	29.7	359 54 2.3	. .	− 0.1	51 0 23.4	+ 2.0
18	27 12	28.1	23.1	16.5	7.2	36	. .	230	. .	290	. .	29.7	27 15 25.2	. .	+ 29.1	78 22 15.5	− 7.8
19	307 30	28.4	24.6	18.4	10.0	36	. .	440	410	360	245	29.7	307 33 20.5	. .	− 1 13.3	358 38 28.4	+ 1.6
20	358 0	28.8	25.7	19.2	8.6	38	. .	885	. .	890	. .	29.7	358 5 16.2	. .	− 1.9	49 11 35.5	− 0.9
21	49 18	22.3	18.5	13.0	2.7	29	. .	085	. .	185	. .	29.7	49 23 18.7	. .	+ 1 5.6	100 30 45.5	+ 2.4
22	46 14	25.1	19.7	15.8	5.7	32	020	. .	. .	. .	125	29.7	46 18 31.3	. .	+ 59.1	97 25 51.6	. .
23	46 14	25.1	19.7	15.8	5.7	34	. .	860	. .	850	. .	29.7	46 17 48.7	. .	+ 59.1	97 25 9.0	. .
24	38 46	25.5	21.0	16.3	6.0	32	. .	235	. .	285	. .	29.7	38 50 27.9	. .	+ 45.5	89 57 34.6	+ 1.9
25	348 54	26.0	23.3	17.3	6.0	35	. .	590	. .	620	. .	29.7	348 57 36.1	. .	− 11.0	40 3 46.3	+ 1.5
26	19 48	26.7	22.7	16.3	5.7	34	. .	175	. .	190	. .	29.7	19 51 57.9	68.0	+ 20.5	70 58 39.6	+ 3.0
27	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
28	24 18	23.8	20.2	15.0	5.2	36	. .	815	. .	820	. .	31.0	24 21 20.6	56.0	+ 26.3	75 28 8.1	+ 3.8
29	10 26	24.0	22.3	15.0	8.0	35	. .	665	. .	675	. .	31.0	10 29 37.0	. .	+ 10.6	61 36 8.8	+ 4.8
30	24 20	25.0	22.7	18.3	9.7	34	. .	150	. .	160	. .	31.0	24 23 58.5	. .	+ 26.0	75 30 45.7	+ 3.8
31	27 0	24.8	19.6	14.3	7.7	37	. .	. .	. .	138	154	26.0	27 3 10.3	. .	+ 28.8	78 10 0.3	. .
32	35 12	22.2	15.9	13.7	5.2	30	. .	. .	. .	232	242	26.0	35 16 58.4	72.4	+ 39.8	86 23 59.4	− 1.2
33	349 24	23.8	19.0	14.6	7.1	30	. .	350	. .	368	. .	26.0	349 28 54.7	. .	− 10.4	40 35 5.5	− 0.5
34	351 26	21.2	15.8	15.5	7.4	31	. .	684	. .	692	. .	26.0	351 30 35.4	. .	− 8.4	42 36 48.2	+ 0.6
35	17 36	18.6	15.8	15.4	29.7	32	666	650	. .	. .	. .	26.0	17 40 23.1	77.3	+ 17.7	68 47 2.0	. .
36	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
37	47 10	25.0	19.2	15.7	6.3	36	. .	216	. .	230	. .	26.0	47 13 24.0	. .	+ 59.9	98 20 45.1	− 0.4
38	56 42	26.4	20.4	17.4	8.2	29	. .	. .	. .	982	992	26.0	56 46 58.1	. .	+ 1 24.4	107 54 43.7	+ 1.4
39	40 6	24.8	19.4	16.5	6.1	34	. .	. .	. .	834	828	26.0	40 9 45.5	. .	+ 46.7	91 16 53.4	− 1.2
40	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
41	31 26	23.2	18.4	19.4	6.5	33	. .	. .	. .	696	706	26.0	31 30 2.7	. .	+ 33.9	82 36 57.8	− 0.8
42	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
43	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
44	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. . .	. . . .	. .	. .	. . . .	. .
45	77 0	10 5.4	28.3	24.1	15.0	33	. .	. .	. .	908	910	33.1	77 3 57.4	. .	+ 3 59.3	128 14 17.9	−20.4
46	79 48	9 25.1	20.2	12.7	5.3	36	. .	. .	. .	138	080	33.1	79 51 33.5	68.9	+ 5 3.6	131 2 58.3	−21.1
47	328 22	27.2	22.7	17.4	9.1	36	. .	. .	. .	422	434	33.1	328 25 27.3	. .	− 34.6	19 31 13.9	0.0
48	293 10	26.6	21.6	16.5	7.2	34	. .	498	. .	458	. .	33.1	293 13 56.3	. .	− 2 10.5	344 18 7.0	+ 3.5
49	225 6	29.3	23.9	18.4	9.1	29	. .	. .	. .	828	832	33.1	225 11 5.0	. .	+ 56.7	5 54 19 5	− 0.7
50	79 16	22.8	17.6	11.4	3.4	32	. .	022	. .	060	. .	33.1	79 20 37.7	. .	+ 4 50.5	130 31 49.4	−21.1

No.	Barom.	At. Ther.
	in.	°
1	30.24	75.0
26	30.25	70.0
28	30.24	56.5
32	30.26	71.5
35	30.23	74.5
42	30.21	81.0
44	30.22	80.0
46	30.11	71.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
22	− 1.4	− 21.3	. .	− 22.7
23	− 1.4	+ 21.3	. .	+ 19.9
31	− 2.9	+ 6.2	. .	+ 3.3
35	− 2.6	− 15 48.1	. .	− 15 50.7

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
May 28	1	θ Virginis . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	2	Polaris, S. P. . .	F.	. .	. .	17.0	51.0	26.0	58.0	31.0	. .	. .	12 24.60	−14.17	. .	− 3.66	1 12 6.77	− 0.99
	3	α Virginis . . .	F.	30.0	32.5	34.0	40.4	42.5	44.6	50.7	52.3	55.0	18 42.44	− 0.44	− 3.67	− 3.66	13 18 38.34	− 0.01
	4	Jupiter I, S. . .	F.	52.3	54.9	56.3	. .	. .	. .	12.9	14.5	17.0	25 4.65	− 0.43	. .	− 3.65	13 25 0.57	. .
	5	Jupiter II, N. . .	F.	. .	. .	3.5	5.5	7.5	9.6	11.7	. .	. .	25 7.56	− 0.43	. .	− 3.65	13 25 3.48	. .
	6	ζ Virginis . . .	F.	13.1	15.7	17.3	23.4	25.4	27.4	33.6	35.1	37.8	28 25.42	− 0.40	− 3.68	− 3.66	13 28 21.36	+ 0.02
	7	η Ursæ Majoris (R.).	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	8	η Bootis	F.	37.0	39.7	41.3	47.8	50.0	52.2	58.6	0.3	3.0	48 49.99	− 0.32	− 3.60	− 3.67	13 48 46.00	− 0.12
	9	μ^1 Bootis	F.	37.0	40.3	42.0	49.9	52.5	55.2	2.8	4.8	8.0	19 52.50	− 0.22	− 3.55	− 3.69	15 19 48.59	− 0.15
	10	Moon II, N. . .	F.	. .	. .	. .	. .	. .	. .	. .	48.5	51.0	39 38.35	− 0.42	. .	− 3.57	23 39 34.36	−66.31
	11	γ Pegasi	F.	39.7	42.4	44.0	. .	. .	. .	0.9	2.4	5.0	6 52.40	− 0.34	− 3.76	− 3.79	0 6 48.27	− 0.03
	12	α Cassiopeæ (R.) .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	13	B. A. C. 334 . .	F.	. .	. .	43.0	45.4	47.8	50.5	52.8	. .	. .	2 47.90	− 0.23	. .	− 3.85	1 2 43.82	+ 0.33
	14	Polaris. . . .	F.	. .	. .	5.0	31.0	57.0	24.0	50.0	. .	. .	11 57.40	+13.15	. .	− 3.81	1 12 6.74	− 1.38
	15	θ Ceti.	F.	38.6	41.3	42.7	46.9	51.0	55.2	59.3	0.8	3.5	17 51.03	− 0.43	− 3.93	− 3.81	1 17 46.79	+ 0.14
30	16	Polaris. . . .	Sk.	21.5	9.5	12.5	4.0	26.0	59.0	22.0	. .	. .	11 56.82	+16.73	. .	− 4.47	1 12 9.08	− 0.63
	17	Polaris. . . .	E.	. .	. .	. .	. .	. .	50.0	36.0	45.0	35.0	11 55.21	+18.01	. .	− 4.65	1 12 8.57	− 1.14
	18	Moon II, N. . .	Sk.	34.0	36.6	38.2	44.7	46.9	49.0	55.4	57.0	59.6	23 46.82	− 0.44	. .	− 4.47	1 23 41.91	−69.14
	19	ο Piscium . . .	E.	. .	. .	. .	. .	. .	56.5	1.0	2.6	5.0	38 52.62	− 0.44	− 4.52	− 4.48	1 38 47.70	+ 0.01
	20	β Arietis	Sk.	. .	. .	. .	. .	. .	. .	57.8	59.2	2.0	47 48.95	− 0.37	− 4.50	− 4.48	1 47 44.10	+ 0.04
	21	α Arietis	Sk.	59.0	1.8	3.4	10.2	12.3	14.6	21.2	22.8	25.6	0 12.32	− 0.36	− 4.41	− 4.48	2 0 7.48	− 0.06
	22	Venus II, N. . .	E.	44.0	46.7	48.0	54.5	56.6	58.7	5.0	6.6	9.2	30 56.59	− 0.44	. .	− 4.65	2 30 51.50	− 0.42
	23	Venus, S. . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	24	α Ceti.	E.	37.6	40.0	41.6	47.6	49.6	51.7	57.9	59.5	2.0	55 49.72	− 0.49	− 4.67	− 4.53	2 55 44.70	+ 0.16
	25	α Persei	E.	. .	. .	25.0	28.0	31.1	34.5	40.8	43.0	47.0	15 28.10	− 0.07	. .	− 4.54	3 15 23.49	+ 0.14
31	26	Sun I, S. . . .	E.	14.8	17.4	19.2	25.6	27.9	30.1	36.8	38.4	41.3	31 27.94	− 0.37	. .	− 4.61	4 31 22.96	. .
	27	Sun II, N. . . .	E.	31.3	34.0	35.6	42.5	44.6	46.8	53.3	55.0	57.8	33 44.54	− 0.37	. .	− 4.61	4 33 39.56	. .
	28	δ Orionis. . . .	E.	. .	. .	37.9	40.0	42.0	44.0	46.1	. .	. .	25 42.00	− 0.51	− 4.60	− 4.58	5 25 36.91	− 0.01
	29	ε Orionis. . . .	E.	44.8	47.4	48.9	54.9	57.0	59.0	5.1	6.5	9.2	29 56.98	− 0.52	− 4.58	− 4.58	5 29 51.88	− 0.01
	30	Mercury I, S. . .	E.	58.4	1.2	2.9	9.6	12.0	14.3	21.0	22.8	25.8	7 12.00	− 0.35	. .	− 4.61	6 7 7.04	+ 0.25
	31	Mercury, N. . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	32	κ Draconis (R.) . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	33	κ Draconis . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	34	21 Cassiopeæ, S. P. .	E.	15.3	5.6	59.7	36.6	29.5	22.3	59.4	53.6	44.2	37 29.58	− 2.23	. .	− 4.69	0 37 22.68	+ 0.23
	35	32^1 Camelopardalis .	E.	21.0	45.0	0.3	39.6	59.5	19.5	. .	. .	. .	48 19.67	+ 3.62	. .	− 4.66	12 48 18.63	−12.09
	36	32^2 Camelopardalis .	E.	28.2	52.6	7.9	47.6	6.8	26.9	. .	. .	. .	48 27.18	+ 3.62	. . .	− 4.70	12 48 26.10	+ 0.25
	37	12 Canum Venat.. .	E.	2.0	5.3	7.4	15.3	18.0	20.5	28.2	30.2	33.6	50 17.83	− 0.22	− 4.70	− 4.71	12 50 12.90	− 0.01
	38	θ Virginis . . .	E.	23.5	26.0	27.5	33.6	35.6	37.8	43.9	45.4	48.0	3 35.70	− 0.54	− 4.74	− 4.70	13 3 30.46	− 0.01
	39	Polaris, S. P. . .	E.	. .	. .	26.5	0.0	33.5	6.5	39.0	. .	. .	12 33.10	−19.33	. .	− 4.71	1 12 9.06	− 1.09
	40	α Virginis . . .	E.	31.2	33.9	35.4	41.5	43.6	45.6	52.0	53.5	56.0	18 43.63	− 0.57	− 4.74	− 4.71	13 18 38.35	+ 0.01
	41	Jupiter I, S. . .	E.	13.5	16.3	17.8	. .	. .	. .	34.3	35.9	38.5	24 26.05	− 0.56	. .	− 4.67	13 24 20.82	. .
	42	Jupiter II, N. . .	E.	. .	. .	24.9	26.9	29.0	31.1	30.2	. .	. .	24 29.02	− 0.56	. .	− 4.67	13 24 23.79	. .
	43	ζ Virginis . . .	E.	16.9	18.4	22.5	24.5	26.5	28.6	30.6	34.7	36.3	28 26.56	− 0.51	− 4.72	− 4.71	13 28 21.34	+ 0.01
	44	η Ursæ Majoris (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	45	η Ursæ Majoris . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	46	η Bootis	E.	38.0	40.8	42.4	49.0	51.0	53.3	59.8	1.4	4.0	48 51.08	− 0.39	− 4.63	− 4.71	13 48 45.98	− 0.13
	47	50 Cassiopeæ, S. P. .	E.	30.8	22.3	17.4	58.0	51.7	45.2	25.5	20.6	12.5	52 51.56	− 2.00	. .	− 4.72	1 52 44.84	+ 0.05
	48	α Draconis (R.) . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .

16, 18, 34, 35, 36, 48. Bisections at sets B and D.
17. Bisections at wires C_6 and D_3.
25, 44. Telescope micrometer reading decreased five revolutions in reduction.
32. Bisections at wires II and III.
33. Bisections at wires V and VI.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	43 40	9 22.1	17.0	11.7	2.3	29	. .	. .	. .	820	850	33.1	43 45 12.6	. .	+ 54.1	94 52 27.9	0.0
2	307 30	22.7	18.8	13.4	6.2	37	068	068	056	056	072	33.1	307 33 19.4	66.6	– 1 13.4	358 38 27.2	+ 0.6
3	49 18	23.5	18.9	12.9	4.0	29	. .	. .	. .	380	390	33.1	49 23 17.8	. .	+ 1 5.9	100 30 44.9	+ 1.8
4	46 14	24.5	19.2	14.4	4.7	36	928	908	. .	. .	. .	33.1	46 17 21.0	. .	+ 59.2	97 24 41.4	. .
5	46 14	24.5	19.2	14.4	4.7	39	. .	. .	. .	680	696	33.1	46 16 39.2	. .	+ 59.1	97 23 59.5	. .
6	38 46	27.3	21.8	18.0	7.0	32	. .	360	. .	380	. .	33.1	38 50 28.2	. .	+ 55.6	89 57 35.0	+ 2.3
7	190 58	10 0.7	26.8	23.5	10.6	32	010	002	. .	024	044	33.1	191 2 28.5	. .	+ 11.1	40 3 41.6	– 3.0
8	19 48	9 24.8	22.5	17.6	7.2	34	. .	. .	. .	438	452	33.1	19 51 57.4	. .	+ 20.5	70 58 39.1	+ 2.7
9	1 0	28.1	24.8	20.8	11.1	30	. .	980	. .	970	. .	33.1	1 4 47.2	61.2	+ 1.1	52 11 9.5	+ 1.0
10	43 46	21.2	18.3	12.3	4.8	43	. .	. .	. .	862	020	33.2	43 47 43.1	. .	+ 53.9	94 54 58.2	. .
11	24 20	26.2	22.4	18.1	9.5	34	. .	474	. .	484	. .	33.2	24 23 55.5	. .	+ 25.5	75 30 42.2	+ 0.5
12	196 54	25.0	21.7	14.7	6.4	38	. .	. .	. .	116	112	33.2	196 56 57.4	. .	+ 17.1	34 9 6.7	+ 2.7
13	3 52	26.9	23.7	17.4	8.7	33	. .	252	. .	264	. .	33.2	3 56 14.3	. .	+ 3.9	55 2 39.4	– 3.7
14	310 12	25.6	22.6	15.8	9.9	32	980	968	962	958	968	33.2	310 16 19.4	69.8	– 1 6.1	1 21 34.5	+ 1.0
15	47 38	22.6	17.5	12.0	4.8	33	. .	550	. .	590	. .	33.2	47 42 14.1	. .	+ 1 1.5	98 49 36.8	+ 1.7
16	310 12	15.9	18.0	10.5	2.4	33	500	380	. .	. .	. .	33.2	310 16 18.0	. .	– 1 6.7	1 21 32.5	– 1.4
17	310 12	15.9	18.0	10.5	2.4	33	. .	. .	. .	320	480	30.2	310 16 18.2	. .	– 1 6.7	1 21 32.7	– 1.2
18	29 44	19.3	17.0	11.8	3.5	34	940	. .	340	. .	376	30.2	29 47 47.3	67.4	+ 32.4	80 54 40.9	. .
19	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
20	18 38	23.9	24.7	20.0	8.3	35	. .	. .	. .	982	900	30.2	18 41 30.4	. .	+ 19.1	69 48 10.7	– 0.4
21	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
22	25 48	26.4	24.7	22.0	10.3	35	970	. .	. .	. .	010	30.2	25 51 27.7	. .	+ 27.2	76 58 16.1	. .
23	25 48	26.4	24.7	22.0	10.3	35	. .	070	. .	190	. .	30.2	25 51 40.8	. .	+ 27.2	76 58 29.2	. .
24	35 12	22.3	20.2	14.6	5.6	30	290	295	. .	330	380	30.2	35 16 59.5	. .	+ 39.6	86 24 0.3	+ 0.2
25	349 24	23.0	22.5	15.2	7.0	35	. .	. .	. .	575	595	30.2	349 28 55.2	. .	– 10.4	40 35 6.0	– 0.3
26	17 8	26.5	23.3	15.6	9.4	29	470	530	. .	. .	. .	30.2	17 13 8.7	. .	+ 17.2	68 19 47.1	. . .
27	16 38	25.6	22.5	16.8	7.8	35	. .	. .	. .	910	980	30.2	16 41 31.6	78.0	+ 16.6	67 48 9.4	. .
28	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	.	. . . .	. .	. .	. . . .	. .
29	40 6	19.8	15.0	12.8	2.4	35	. .	220	. .	250	. .	30.2	40 9 47.4	. .	+ 46.4	91 16 55.0	+ 0.8
30	13 14	24.0	20.4	15.3	6.3	35	670	. .	. .	. .	730	30.2	13 17 36.7	82.5	+ 13.0	64 24 10.9	. .
31	13 14	24.0	20.4	15.3	6.3	36	. .	085	. .	160	. .	30.2	13 17 30.0	. .	+ 13.0	64 24 4.2	. .
32	211 30	28.7	27.3	23.0	7.5	31	570	590	. .	. .	. .	32.9	211 34 36.2	. .	+ 34.4	19 31 10.6	– 3.0
33	328 22	23.0	22.0	15.2	5.7	36	. .	. .	. .	465	475	32.9	328 25 28.1	71.5	– 34.4	19 31 14.9	+ 1.3
34	293 10	25.2	23.8	18.5	7.4	34	375	470	. .	. .	. .	32.9	293 13 56.1	. .	– 2 9.7	344 18 7.6	+ 3.3
35	314 46	22.7	19.3	16.5	8.3	39	805	. .	745	. .	. .	32.9	314 48 36.8	. .	– 56.4	5 54 0.6	+ 9.1
36	314 46	22.7	19.3	16.5	8.3	38	515	. .	500	. .	. .	32.9	314 48 56.2	. .	– 56.4	5 54 21.0	+ 1.2
37	359 50	21.5	21.3	22.0	4.2	34	215	. .	. .	. .	270	32.9	359 54 1.2	. .	– 0.1	51 0 22.3	+ 1.5
38	43 40	24.5	22.3	16.4	5.3	29	. .	340	. .	355	. .	32.9	43 45 15.7	. .	+ 53.7	94 52 30.6	+ 2.8
39	307 30	21.8	21.2	13.6	6.5	36	990	. .	025	. .	005	32.9	307 33 19.5	. .	– 1 13.0	358 38 27.7	+ 1.7
40	49 18	21.3	19.3	13.0	2.8	29	. .	235	. .	255	. .	32.9	49 23 20.3	. .	+ 1 5.3	100 30 46.8	+ 3.7
41	46 10	27.8	25.0	18.6	7.7	32	960	. .	. .	. .	140	32.9	46 14 16.3	. .	+ 58.6	97 21 36.1	. .
42	46 10	27.8	25.0	18.6	7.7	35	. .	915	. .	955	. .	32.9	46 13 32.2	. .	+ 58.6	97 20 52.0	. .
43	38 46	24.0	20.8	15.2	4.3	32	. .	480	. .	490	. .	32.9	38 50 28.7	. .	+ 45.3	89 57 35.2	+ 2.7
44	190 58	28.0	26.0	21.5	8.3	37	090	125	. .	. .	. .	. .	191 2 28.7	. .	+ 11.0	40 3 41.5	– 2.5
45	348 54	23.8	22.3	15.5	5.3	35	. .	. .	. .	965	970	. .	348 57 35.7	. .	– 11.0	40 3 45.9	+ 1.9
46	19 48	24.0	24.2	20.0	6.3	34	. .	350	. .	380	. .	32.9	19 51 57.5	. .	+ 20.4	70 58 39.1	+ 3.1
47	290 40	27.0	26.0	19.8	8.5	30	. .	285	. .	310	. .	32.9	290 44 57.0	. .	– 2 27.5	341 48 50.7	+ 2.4
48	206 0	28.6	27.3	20.5	8.5	32	640	. .	690	. .	. .	32.9	206 4 20.6	. .	+ 27.6	25 1 33.0	– 2.1

No.	Barom.	At. Ther
	in.	°
2	30.11	69.0
9	30.07	64.5
14	30.02	67.8
18	30.13	65.0
27	30.11	75.5
33	30.10	73.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
4	– 1.4	– 20.9	. .	– 22.3
5	– 1.4	+ 21.0	. .	+ 19.6
10	–40 18.0	+ 15 58.1	. .	– 24 19.9
18	–29 42.7	+ 16 26.0	. .	– 13 16.7
22	– 2.8	+ 6.7	. .	+ 3.9
23	– 2.8	– 6.7	+ 0.3	– 9.2
26	– 2.6	– 15 48.8	. .	– 15 51.4
27	– 2.5	+ 15 48.8	. .	+ 15 46.3
30	– 2.0	– 3.4	. .	– 5.4
31	– 2.0	+ 3.4	– 0.1	+ 1.3
41	– 1.4	– 22.0	. .	– 23.4
42	– 1.4	+ 22.1	. .	+ 20.7

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s	s.	h. m. s.	s.
May 31	1	α Draconis	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	2	α Bootis (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	3	α Bootis	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	4	B. A. C. 4759	E.	. .	. .	. .	. .	. .	. .	38.7	40.6	43.9	15 28.18	− 0.74	. .	− 4.68	14 15 22.76	− 2.15
	5	θ Bootis	E.	44.3	48.3	51.0	0.7	4.1	7.6	17.8	20.0	24.3	21 4.23	− 0.02	. .	− 4.72	14 20 59.49	+ 0.02
	6	B. A. C. 5160	E.	43.2	46.0	48.0	55.0	57.7	0.1	7.6	9.2	12.6	31 57.71	− 0.70	. .	− 4.69	15 31 52.32	− 2.51
	7	B. A. C. 5199	E.	38.7	41.6	43.6	50.9	53.3	55.8	3.5	5.2	8.1	38 53.41	− 0.71	. .	− 4.69	15 38 48.01	− 2.54
	8	B. A. C. 5230	E.	1.3	3.8	5.3	11.4	13.4	15.5	21.5	23.0	25.6	43 13.42	− 0.54	. .	− 4.69	15 43 8.19	− 2.27
	9	B. A. C. 5261	E.	35.0	38.0	39.9	47.0	49.2	51.8	58.9	0.6	3.6	47 49.33	− 0.68	. .	− 4.69	15 47 43.96	− 2.51
	10	Lalande 29319	E.	35.8	38.9	40.9	48.6	51.1	53.7	1.4	3.1	6.4	58 51.10	− 0.24	. .	− 4.70	15 58 46.16	− 2.56
	11	Lalande 29403	E.	10.4	13.5	15.5	23.1	25.6	28.1	36.0	37.9	41.5	1 25.73	− 0.21	. .	− 4.70	16 1 20.79	− 2.56
	12	Lalande 29433	E.	50.0	52.0	. .	59.6	2.0	4.6	7.4	12.5	14.4	2 2.17	− 0.24	. .	− 4.70	16 1 57.23	− 2.56
	13	Lalande 29638	E.	20.6	23.8	25.8	33.3	35.9	38.6	46.0	47.9	51.0	8 35.88	− 0.24	. .	− 4.70	16 8 30.94	− 2.55
	14	Lalande 29685	E.	7.0	10.3	12.2	20.0	22.5	25.2	32.8	34.7	37.9	10 22.51	− 0.24	. .	− 4.70	16 10 17.57	− 2.55
	15	Lalande 29708	E.	10.2	13.2	15.2	22.9	25.5	28.1	36.0	37.9	40.8	11 25.53	− 0.24	. .	− 4.70	16 11 20.59	− 2.55
	16	α Scorpii	E.	39.0	41.8	43.5	50.4	52.6	54.9	1.8	3.6	6.3	21 52.66	− 0.66	− 4.71	− 4.76	16 21 47.24	− 0.06
	17	ζ Ophiuchi	E.	11.9	14.6	16.0	22.1	24.3	26.4	32.5	34.0	36.7	30 24.28	− 0.57	− 4.72	− 4.77	16 30 18.94	− 0.05
	18	η Herculis	E.	28.4	31.6	33.5	41.5	44.1	46.9	54.6	56.5	59.9	38 44.11	− 0.22	− 4.67	− 4.77	16 38 39.12	− 0.09
	19	Amphitrite	E.	52.0	55.0	56.8	4.0	6.4	8.8	16.0	17.8	20.9	43 6.41	− 0.69	. .	− 4.70	16 43 1.02	. .
	20	Polaris	F.	. .	. .	9.0	35.0	1.0	27.0	54.0	. .	. .	12 1.20	+13.32	. .	− 5.05	1 12 9.47	− 1.12
	21	η Piscium	F.	40.3	43.0	44.6	50.9	53.0	55.2	1.4	3.0	5.7	24 53.01	− 0.25	− 4.98	− 5.05	1 24 47.71	0.00
	22	α Arietis	F.	59.5	2.2	4.0	10.4	12.8	15.0	21.5	23.0	26.2	0 12.73	− 0.22	− 4.93	− 5.06	2 0 7.45	− 0.12
	23	Venus II, N.	F.	23.6	26.2	27.8	34.1	36.3	38.5	44.7	46.3	48.9	35 36.27	− 0.26	. .	− 5.06	2 35 30.95	− 0.42
	24	Venus, S.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	25	β Ursæ Minoris, S. P.	F.	. .	. .	33.9	25.5	19.0	10.3	3.8	. .	. .	51 18.50	− 1.65	. .	− 5.07	14 51 11.78	+ 0.51
	26	α Ceti	F.	. .	. .	45.9	47.9	50.0	52.0	54.1	. .	. .	55 49.98	− 0.30	− 5.10	− 5.07	2 55 44.61	+ 0.05
	27	B. A. C. 953	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	28	α Persei	F.	9.7	13.6	15.9	25.2	28.5	31.7	41.0	43.3	47.1	15 28.44	− 0.01	. .	− 5.08	3 15 23.35	− 0.03
	29	η Tauri	F.	. .	. .	. .	. .	. .	13.0	17.4	19.0	21.7	40 8.42	− 0.21	− 5.27	− 5.09	3 40 3.12	+ 0.18
June 1	30	Sun I, S.	F.	20.2	23.3	25.0	31.6	33.7	36.0	42.5	44.1	46.9	35 33.70	− 0.22	. .	− 5.20	4 35 28.28	. .
	31	Sun II, N.	F.	37.0	39.9	41.5	48.2	50.3	52.6	59.0	0.7	3.6	37 50.31	− 0.22	. .	− 5.20	4 37 44.89	. .
3	32	α Arietis	E.	0.5	3.1	4.9	11.5	13.7	15.9	22.5	24.2	27.0	0 13.70	− 0.46	− 5.58	− 5.54	2 0 7.70	+ 0.05
	33	γ Ceti	E.	. .	. .	. .	. .	. .	. .	3.8	5.3	8.0	36 55.64	− 0.59	− 5.65	− 5.54	2 36 49.51	+ 0.11
	34	Venus II, S.	E.	28.5	31.0	32.6	39.0	41.2	43.3	49.5	51.0	54.0	49 41.12	− 0.52	. .	− 5.60	2 49 35.00	− 0.41
	35	Venus, N.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	36	α Ceti	E.	38.5	41.0	42.6	48.8	50.8	52.9	59.0	0.5	3.0	55 50.79	− 0.58	− 5.57	− 5.54	2 55 44.67	+ 0.05
	37	α Persei	E.	10.6	14.5	17.1	26.2	29.3	32.6	41.9	44.4	48.4	15 29.44	− 0.18	. .	− 5.54	3 15 23.72	+ 0.26
4	38	Sun I, N.	E.	. .	. .	. .	. .	. .	57.3	1.6	3.3	6.2	47 52.79	− 0.46	. .	− 5.61	4 47 46.72	+68.53
	39	Mercury I, S.	E.	0.4	3.0	4.8	11.7	13.8	16.3	22.9	24.7	27.4	31 13.89	− 0.45	. .	− 5.61	6 31 7.83	+ 0.27
	40	Mercury, N.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	41	α Canis Majoris	E.	31.4	33.9	35.6	41.9	44.2	46.4	52.5	54.3	56.9	39 44.12	− 0.68	− 5.68	− 5.57	6 39 37.87	+ 0.03
	42	α^2 Geminorum	E.	28.9	31.9	34.0	40.9	43.4	45.9	53.0	54.8	57.9	26 43.41	− 0.39	− 5.63	− 5.58	7 26 37.44	+ 0.29
	43	α Canis Minoris	E.	39.4	42.0	43.4	49.5	51.5	53.6	59.8	1.3	3.8	32 51.59	− 0.57	− 5.64	− 5.58	7 32 45.44	− 0.10
	44	β Geminorum	E.	32.2	35.0	36.8	43.7	46.0	48.4	55.2	57.0	0.0	37 46.03	− 0.42	− 5.58	− 5.58	7 37 40.03	− 0.03
	45	32^1 Camelopardalis	E.	. .	. .	39.0	59.5	19.4	39.0	58.8	. .	. .	48 19.34	+ 3.41	. .	− 5.51	12 48 17.24	−11.38
	46	32^2 Camelopardalis	E.	. .	. .	46.6	7.0	27.0	46.0	6.6	. .	. .	48 26.64	+ 3.41	. .	− 5.62	12 48 24.43	− 0.71
	47	12 Canum Venat.	E.	3.0	6.4	8.4	16.1	18.8	21.5	29.3	31.3	34.6	50 18.82	− 0.33	− 5.63	− 5.62	12 50 12.87	+ 0.01
	48	θ Virginis	E.	24.3	26.9	28.4	34.5	36.6	38.6	44.9	46.4	48.8	3 36.60	− 0.64	− 5.55	− 5.63	13 3 30.33	− 0.12
	49	Polaris, S. P.	E.	. .	. .	30.5	5.0	38.5	12.0	46.0	. .	. .	12 38.40	−18.87	. .	− 5.63	1 12 13.90	+ 0.15

1. Bisections at wires V and VI.
3. Telescope micrometer reading increased one revolution in reduction.
6, 11, 12, 15, 19. Wire A used.
10. Telescope micrometer readings decreased one revolution in reduction.
14. Wire B used.
25. Bisections at set B.
45, 46. Bisections at wires C_1 and C_2.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	333 52	9 24.5	23.0	16.7	7.2	35	. .	. .	. .	560	535	32.9	333 55 40.7	. .	— 27.6	25 1 34.3	— 0.8
2	160 52	28.9	26.7	22.7	11.0	31	750	685	. .	. .	. .	32.9	160 56 32.7	. .	— 19.5	70 10 8.0	+ 3.2
3	19 0	29.8	28.0	25.7	11.7	35	. .	. .	. .	090	100	32.9	19 3 26.2	. .	+ 19.5	70 10 6.9	+ 2.1
4	77 42	25.7	22.3	16.3	6.5	33	. .	. .	. .	615	695	32.9	77 46 9.1	. .	+ 4 13.9	128 56 44.2	—19.9
5	346 24	25.0	22.8	16.7	4.3	33	. .	. .	. .	565	590	32.9	346 28 11.3	67.5	— 13.6	37 34 18.9	+ 2.3
6	72 46	25.7	21.3	17.0	5.0	40	. .	230	. .	170	. .	32.9	72 51 2.1	. .	+ 3 1.3	124 0 24.6	— 16.5
7	73 4	25.8	23.2	16.2	6.7	33	. .	335	. .	365	. .	32.9	73 8 13.4	. .	+ 3 4.6	124 17 39.2	—16.2
8	41 52	23.1	21.5	17.2	5.2	34	. .	980	. .	020	. .	32.9	41 55 49.5	. .	+ 50.9	93 3 1.6	—13.6
9	69 30	27.2	24.8	19.2	9.0	32	970	980	. .	. .	. .	32.9	69 34 16.6	. .	+ 2 31.0	120 43 8.8	—15.5
10	1 52	29.8	29.5	22.5	11.6	38	. .	225	. .	310	. .	32.9	1 55 8.5	. .	+ 1.9	53 1 31.6	—10.1
11	1 52	29.8	29.5	22.5	11.6	38	. .	030	. .	060	. .	32.9	1 57 29.5	. .	+ 1.9	53 3 52.6	—10.2
12	1 52	29.8	29.5	22.5	11.6	32	. .	840	. .	860	. .	32.9	1 58 49.0	. .	+ 1.9	53 5 12.1	—10.3
13	1 52	29.8	29.5	22.5	11.6	31	. .	970	. .	980	. .	32.9	1 56 29.5	. .	+ 1.9	53 2 52.6	—10.6
14	1 52	29.8	29.5	22.5	11.6	33	215	250	. .	. .	. .	32.9	1 53 37.2	. .	+ 1.9	53 0 0.3	—10.6
15	1 52	29.8	29.5	22.5	11.6	21	. .	. .	. .	040	. .	32.9	2 1 50.1	. .	+ 2.0	53 8 13.3	—10.7
16	64 56	24.8	21.5	16.5	6.3	30	. .	. .	. .	250	250	32.9	65 1 1.8	. .	+ 2 1.3	116 9 24.3	+ 2.0
17	49 8	26.2	23.7	17.2	7.2	36	. .	045	. .	095	. .	32.9	49 11 31.3	. .	+ 1 5.7	100 18 58.2	+ 3.1
18	359 40	27.5	27.0	22.3	9.3	33	. .	185	. .	245	. .	32.9	359 44 12.4	64.0	— 0.3	50 50 33.3	+ 2.9
19	70 32	28.0	25.3	22.0	9.7	38	. .	180	. .	420	. .	32.9	70 37 27.2	. .	+ 2 40.2	121 46 28.6	— 4.8
20	310 12	28.2	26.3	18.3	14.0	32	632	530	598	580	586	30.6	310 16 19.4	69.2	— 1 6.5	1 21 34.1	+ 0.1
21	24 8	23.0	19.5	12.5	5.6	37	. .	634	. .	646	. .	30.6	42 11 8.5	. .	+ 25.3	75 17 55.0	+ 1.2
22	15 58	26.2	26.7	21.0	9.8	37	210	. .	. .	. .	256	30.6	16 1 9.1	. .	+ 16.1	67 7 46.4	+ 2.3
23	25 24	25.1	18.7	15.0	7.2	33	510	. .	. .	. .	850	30.6	25 28 7.8	. .	+ 26.6	76 34 55.6	. .
24	25 24	25.1	18.7	15.0	7.2	32	. .	778	. .	830	. .	30.6	25 28 21.2	. .	+ 26.6	76 35 9.0	. .
25	293 32	28.8	26.2	18.1	12.7	34	816	932	. .	. .	. .	30.6	293 35 44.1	. .	— 2 6.9	344 39 58.4	+ 2.5
26	35 12	23.0	18.5	12.9	5.0	30	. .	360	. .	430	. .	30.6	35 16 59.6	. .	+ 39.4	86 24 0.2	+ 0.3
27	0 28	22.2	18.8	10.5	4.5	32	. .	. .	. .	938	942	30.6	0 32 22.2	76.0	+ 0.5	51 38 43.9	+ 2.4
28	349 24	25.3	23.8	17.6	8.6	30	. .	450	. .	436	. .	30.6	349 28 55.3	. .	— 10.3	40 35 6.2	— 0.2
29	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
30	17 2	24.0	23.8	17.1	6.2	38	905	. .	. .	. .	. .	30.6	17 4 46.0	. .	+ 17.0	68 11 24.2	. .
31	16 30	25.6	25.0	19.5	9.5	37	. .	. .	. .	176	102	30.6	16 33 12.0	78.0	+ 16.5	67 39 49.7	. .
32	15 58	29.0	25.3	21.5	10.4	37	. .	. .	. .	420	430	34.3	16 1 9.6	72.0	+ 16.2	67 7 47.0	+ 3.1
33	36 6	29.3	25.5	21.0	7.8	32	. .	. .	. .	515	585	34.3	36 10 24.7	.	+ 41.0	87 17 26.9	+ 3.1
34	24 16	10 2.5	27.3	23.3	13.2	33	765	. .	. .	. .	985	34.3	24 20 1.0	. .	+ 25.3	75 26 47.5	. .
35	24 16	2.5	27.3	23.3	13.2	34	. .	665	. .	755	. .	34.3	24 19 48.1	. .	+ 25.3	75 26 34.6	. .
36	35 12	0.3	25.3	21.0	10.0	30	. .	005	. .	085	. .	34.3	35 17 1.9	. .	+ 39.6	86 24 2.7	+ 3.2
37	349 24	0.5	29.0	22.8	12.3	30	. .	170	. .	270	. .	34.3	349 28 57.6	. .	— 10.4	40 35 8.4	+ 1.7
38	16 6	4.5	1.1	26.5	16.2	31	535	630	. .	. .	. .	34.3	16 10 30.2	79.8	+ 16.1	67 17 7.5	. .
39	13 40	4.0	28.4	26.5	16.1	32	780	. .	. .	. .	870	34.3	13 44 14.3	. .	+ 13.5	64 50 49.0	. .
40	13 40	4.0	28.4	26.5	16.1	33	. .	220	. .	245	. .	34.3	13 44 8.6	. .	+ 13.5	64 50 43.3	. .
41	55 20	3.2	2.0	23.1	12.1	29	. .	460	. .	570	. .	34.3	55 25 6.5	. .	+ 1 19.7	106 32 47.4	+ 1.8
42	6 40	1.8	29.0	27.3	13.3	34	. .	. .	. .	770	755	34.3	6 43 46.6	. .	+ 6.5	57 50 14.3	+ 2.0
43	33 16	9 28.3	28.0	21.5	11.5	32	. .	315	. .	400	. .	34.3	33 20 25.9	. .	+ 36.1	84 27 23.2	+ 3.7
44	10 30	10 4.0	29.0	23.5	15.3	34	. .	615	. .	690	. .	34.3	10 33 47.7	85.0	+ 10.2	61 40 19.1	+ 3.2
45	314 46	2.8	28.0	20.0	13.1	39	300	325	. .	. .	. .	33.8	314 48 37.7	. .	— 56.4	5 54 2.5	+ 9.6
46	314 46	2.8	28.0	20.0	13.1	38	165	170	. .	. .	. .	33.8	314 48 55.3	. .	— 56.4	5 54 20.1	+ 0.6
47	359 50	1.5	29.3	22.7	10.3	33	. .	800	. .	860	. .	33.8	359 54 1.9	72.5	— 0.1	51 0 23.0	+ 2.7
48	43 40	3.2	27.4	20.3	11.3	29	. .	000	. .	110	. .	33.8	43 45 15.2	. .	+ 53.7	94 52 30.1	+ 2.5
49	307 30	1.8	28.2	21.3	13.9	36	570	. .	590	. .	580	33.8	307 33 19.0	. .	— 1 13.0	358 38 27.2	+ 1.6

No.	Barom.	At. Ther.
	in.	°
18	30.10	66.0
20	30.17	67.3
27	30.19	73.0
31	30.17	75.2
32	30.27	70.5
38	30.27	78.0
44	30.24	. .
47	30.23	74.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
23	— 2.7	+ 6.7	. .	+ 4.0
24	— 2.7	— 6.7	0.0	— 9.4
30	— 2.6	— 15 47.2	. .	— 15 49.8
31	— 2.5	+ 15 47.2	. .	+ 15 44.7
34	— 2.5	— 6.5	+ 0.1	— 8.9
35	— 2.5	+ 6.5	. .	+ 4.0
38	— 2.4	+ 15 47.8	. .	+ 15 45.4
39	— 2.3	— 2.9	. .	— 5.2
40	— 2.3	+ 2.9	— 0.1	+ 0.5

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII	VIII	IX	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
June 4	1	α Virginis	E.	32.0	34.7	36.3	42.5	44.5	46.5	52.9	54.4	57.0	18 44.53	− 0.67	− 5.56	− 5.63	13 18 38.23	− 0.09
	2	38 Cassiopeæ, S. P.	E.	38.5	. .	26.2	14.7	8.6	3.0	. .	. .	. .	22 2.94	− 1.93	. .	− 5.63	1 21 55.38	+ 0.19
	3	ζ Virginis	E.	15.0	17.7	19.3	25.4	27.4	29.5	35.7	37.2	39.7	28 27.43	− 0.61	− 5.51	− 5.63	13 28 21.19	− 0.12
	4	B. A. C. 4629^2.	E.	55.0	58.0	59.8	7.0	9.4	11.8	19.0	20.7	23.8	46 9.39	− 0.71	. .	− 5.63	13 46 3.09	− 1.87
	5	η Bootis	E.	39.0	41.8	43.5	49.9	52.1	54.3	0.7	2.3	5.0	48 52.07	− 0.50	− 5.53	− 5.63	13 48 45.94	− 0.15
	6	B. A. C. 4674	E.	40.5	43.5	45.2	52.4	54.9	57.3	4.5	6.2	9.3	55 54.87	− 0.77	. .	− 5.54	13 55 48.56	− 1.94
	7	B. A. C. 4681	E.	17.7	21.0	23.0	31.0	33.7	36.0	44.4	46.4	50.0	58 33.73	− 0.83	. .	− 5.54	13 58 27.36	− 2.03
	8	α Bootis (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	9	α Bootis	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	10	B. A. C. 4954	E.	. .	. .	. .	. .	23.8	26.4	31.8	33.7	37.0	57 21.01	− 0.83	. .	− 5.57	14 57 14.61	− 2.46
	11	B. A. C. 4996	E.	8.8	11.9	13.8	21.4	24.0	26.4	23.9	25.8	29.0	5 23.89	− 0.80	. .	− 5.57	15 5 17.52	− 2.42
	12	B. A. C. 5017	E.	43.9	47.2	49.2	57.2	0.0	2.7	10.8	12.8	16.1	7 59.99	− 0.83	. .	− 5.57	15 7 53.59	− 2.54
	13	B. A. C. 5118	E.	41.9	45.3	47.2	55.4	58.1	0.8	8.9	10.8	14.3	26 58.08	− 0.83	. .	− 5.59	15 26 51.66	− 2.65
	14	B. A. C. 5160	E.	44.2	47.3	49.0	56.4	58.9	1.3	8.7	10.4	13.5	31 58.86	− 0.79	. .	− 5.59	15 31 52.48	− 2.54
	15	Nemesis	E.	33.2	35.7	37.4	44.0	46.0	48.1	54.4	56.3	58.5	42 45.96	− 0.70	. .	− 5.60	15 42 39.66	. .
	16	Lalande 29319	E.	36.8	40.0	42.0	49.6	52.2	54.7	2.3	4.0	7.6	58 52.13	− 0.36	. .	− 5.61	15 58 46.16	− 2.57
	17	Lalande 29403	E.	11.5	14.6	16.6	24.2	26.7	29.5	37.0	39.0	42.4	1 26.83	− 0.36	. .	− 5.61	16 1 20.86	− 2.57
	18	Lalande 29433	E.	47.9	51.1	53.0	0.6	3.1	5.8	13.5	15.5	18.6	2 3.23	− 0.36	. .	− 5.61	16 1 57.26	− 2.57
	19	Lalande 29638	E.	21.7	24.8	26.7	34.4	37.0	39.5	47.1	49.1	52.3	8 36.96	− 0.36	. .	− 5.61	16 8 30.99	− 2.57
	20	Lalande 29685	E.	8.2	11.4	13.3	21.0	23.5	26.0	33.7	35.6	39.0	10 23.52	− 0.36	. .	− 5.61	16 10 17.55	− 2.57
	21	Lalande 29708	E.	11.3	14.5	16.5	24.0	26.6	29.1	36.9	38.8	42.0	11 26.63	− 0.36	. .	− 5.61	16 11 20.66	− 2.56
	22	η. Draconis	E.	1.4	6.8	10.0	22.9	27.4	31.5	44.6	47.6	53.0	22 27.24	+ 0.09	. .	− 5.65	16 22 21.68	− 0.03
	23	A Draconis	E.	49.6	56.7	1.0	18.0	23.7	29.2	46.5	50.6	58.0	28 23.70	+ 0.40	. .	− 5.65	16 28 18.45	− 0.07
	24	B. A. C. 5583	E.	58.8	2.4	4.1	. .	. .	. .	25.6	27.5	31.0	35 14.90	− 0.83	. .	− 5.62	16 35 8.45	− 2.98
	25	B. A. C. 5584	E.	7.0	10.2	12.4	. .	. .	. .	33.7	35.8	39.4	35 23.08	− 0.83	. .	− 5.62	16 35 16.63	− 2.98
	26	Amphitrite	E.	35.6	38.6	40.5	. .	. .	. .	59.7	1.4	4.5	38 50.05	− 0.77	. .	− 5.62	16 38 43.66	. .
	27	κ Ophiuchi	E.	41.4	43.9	45.5	51.6	53.6	55.7	2.0	3.5	6.0	51 53.69	− 0.56	− 5.68	− 5.66	16 51 47.47	+ 0.06
	28	B. A. C. 5753	E.	50.6	53.4	54.9	59.0	1.0	3.0	5.1	7.4	. .	58 3.18	− 0.54	. .	− 5.63	16 57 57.01	− 2.34
	29	B. A. C. 5757	E.	9.0	11.6	13.0	19.5	21.5	23.5	29.8	31.4	34.0	58 21.48	− 0.54	. .	− 5.63	16 58 15.31	− 2.34
	30	α Herculis	E.	52.7	55.4	57.0	3.3	5.4	7.5	13.8	15.3	18.0	9 5.38	− 0.53	− 5.61	− 5.66	17 8 59.19	− 0.03
	31	Eugenia	E.	. .	. .	. .	. .	. .	. .	30.0	32.0	34.4	13 21.85	− 0.68	. .	− 5.64	17 13 15.53	. .
	32	XVII, 5	E.	11.2	14.0	15.7	22.6	25.0	27.3	34.0	35.8	38.8	18 24.93	− 0.75	. .	− 5.65	17 18 18.53	− 2.71
	33	XVII, 8	E.	43.0	46.0	47.5	54.2	56.5	58.7	5.4	7.0	10.0	23 56.48	− 0.73	. .	− 5.65	17 23 50.10	− 2.64
	34	α Ophiuchi	E.	4.0	6.6	8.1	14.3	16.4	18.5	24.8	26.3	29.0	29 16.44	− 0.54	− 5.64	− 5.66	17 29 10.24	+ 0.01
9	35	Polaris, S. P.	F.	. .	. .	41.1	15.0	48.5	21.0	52.0	. .	. .	12 47.50	−23.06	. .	− 6.80	1 12 17.64	− 0.01
	36	α Virginis	F.	33.4	35.9	37.4	43.7	45.9	48.0	54.2	55.7	58.4	18 45.84	− 0.72	− 6.85	− 6.80	13 18 38.32	+ 0.03
	37	Jupiter I	F.	51.9	54.4	55.9	. .	. .	. .	12.5	13.9	16.5	23 4.18	− 0.77	. .	− 6.80	13 22 56.61	. .
	38	Jupiter II	F.	. .	. .	2.9	4.9	6.9	9.0	11.1	. .	. .	23 6.96	− 0.77	. .	− 6.80	13 22 59.39	. .
	39	η Bootis (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	40	α Draconis	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	41	α Bootis (R.)	F.	53.5	56.2	57.7	4.2	6.4	8.5	15.0	16.6	19.4	10 6.39	+ 0.12	. .	− 6.81	14 9 59.70	− 0.01
	42	θ Bootis (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	43	ε Bootis	F.	27.5	30.3	32.2	38.8	41.0	43.5	50.4	52.0	54.9	39 41.18	− 0.40	− 6.78	− 6.82	14 39 33.96	− 0.06
	44	α^2 Libræ	F.	54.8	57.5	59.0	5.5	7.7	9.8	16.0	17.7	20.5	44 7.61	− 0.76	− 6.79	− 6.82	14 44 0.03	− 0.04
	45	β Ursæ Minoris (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	46	β Ursæ Minoris	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	47	β Libræ (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	β Libræ	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	49	μ^1 Bootis	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .

15, 18, 21, 26, 31. Wire A used.
20, 28. Wire B used.
22. Telescope micrometer reading decreased five revolutions in reduction.
45. Bisections at set C.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	49 18	9 28.3	18.4	10.0	1.3	29	. .	315	. .	440	. .	33.8	49 23 18.7	. .	+ 1 5.5	100 30 45.4	+ 2.5
2	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
3	38 46	10 0.5	24.8	15.3	7.4	32	. .	265	. .	320	. .	33.8	38 50 29.2	. .	+ 45.2	89 57 35.6	+ 3.4
4	70 6	9 26.8	20.7	13.7	4.5	34	. .	480	. .	480	. .	33.8	70 9 58.5	. .	+ 2 34.6	121 18 54.3	−19.5
5	19 48	27.8	24.7	17.8	6.8	34	. .	415	. .	455	. .	33.8	19 51 56.7	. .	+ 20.3	70 58 38.2	+ 2.7
6	69 52	10 1.3	25.7	19.8	7.9	32	. .	480	. .	520	. .	33.8	69 56 21.6	. .	+ 2 32.8	121 5 15.6	−19.4
7	79 20	9 26.8	21.2	12.0	4.0	34	. .	585	. .	635	. .	33.8	79 23 56.9	. .	+ 4 50.7	130 35 8.8	−21.1
8	162 52	10 1.3	27.7	21.3	9.7	31	655	675	. .	. .	. .	33.8	160 56 35.2	. .	− 19.5	70 10 5.5	+ 1.2
9	19 0	2.1	27.8	22.8	10.5	36	. .	. .	. .	285	310	33.8	19 3 24.6	. .	+ 19.5	70 10 5.3	+ 1.0
10	79 20	6.1	0.7	23.3	13.3	34	. .	. .	. .	660	750	33.8	79 23 45.8	69.5	+ 4 51.8	130 34 58.8	−19.1
11	74 24	9 29.1	21.7	14.5	4.8	35	. .	325	. .	440	. .	33.8	74 27 43.6	. .	+ 3 19.9	125 37 24.7	−18.2
12	79 46	10 1.6	26.0	17.7	7.4	32	. .	408	. .	462	. .	33.8	79 50 25.5	. .	+ 5 4.1	131 1 50.8	−18.7
13	79 30	9 28.0	22.6	13.7	4.5	35	. .	570	. .	605	. .	33.8	79 33 40.7	. .	+ 4 56.6	130 44 58.5	−17.7
14	72 46	10 2.0	25.7	20.5	7.8	29	. .	955	. .	105	. .	33.8	72 51 1.6	. .	+ 3 0.9	124 0 23.7	−16.8
15	56 14	9 27.5	22.3	18.0	5.0	36	. .	065	. .	030	. .	33.8	56 20 5.8	. .	+ 1 24.7	107 27 51.7	− 3.7
16	1 52	10 3.8	29.8	23.2	11.7	37	370	340	. .	. .	. .	33.8	1 55 6.6	. .	+ 1.9	53 1 29.7	− 9.1
17	1 52	3.8	29.8	23.2	11.7	28	200	160	. .	. .	. .	33.8	1 57 27.1	. .	+ 1.9	53 3 50.2	− 9.2
18	1 52	3.8	29.8	23.2	11.7	32	. .	. .	. .	880	900	33.8	1 58 49.5	. .	+ 2.0	53 5 12.7	− 9.2
19	1 52	3.8	29.8	23.2	11.7	32	140	160	. .	. .	. .	33.8	1 56 26.3	. .	+ 1.9	53 2 49.4	− 9.5
20	1 52	3.8	29.8	23.2	11.7	33	500	450	. .	. .	. .	33.8	1 53 33.0	. .	+ 1.9	52 59 56.1	− 9.6
21	1 52	3.8	29.8	23.2	11.7	21	. .	165	. .	285	. .	33.8	2 1 46.6	. .	+ 2.0	53 8 9.8	− 9.6
22	337 2	1.4	27.5	19.4	8.6	37	. .	785	. .	755	. .	33.8	337 6 20.2	. .	− 23.9	28 12 17.5	+ 0.3
23	329 48	1.5	27.7	20.2	9.5	33	. .	915	. .	945	. .	33.8	329 52 2.2	. .	− 32.9	20 57 50.5	+ 0.9
24	79 38	9 28.7	23.0	15.9	4.3	35	825	950	. .	. .	. .	33.8	79 41 34.9	. .	+ 5 0.9	130 52 57.0	−13.4
25	79 38	28.7	23.0	15.9	4.3	37	470	460	. .	. .	. .	33.8	79 41 10.7	. .	+ 5 0.7	130 52 32.6	−13.4
26	70 26	10 1.2	25.4	19.7	9.2	33	. .	890	. .	100	. .	33.8	70 32 33.9	. .	+ 2 38.9	121 41 34.0	− 4.8
27	29 14	0.5	26.7	20.2	8.3	29	. .	880	. .	920	. .	33.8	29 19 3.9	. .	+ 31.8	80 25 56.9	+ 1.7
28	25 4	1.9	28.7	23.3	9.0	30	. .	400	. .	440	. .	33.8	25 6 21.3	. .	+ 26.6	76 13 9.0	−12.0
29	25 4	1.9	28.7	23.3	9.0	32	. .	. .	. .	090	110	33.8	25 8 28.8	. .	+ 26.6	76 15 16.6	−12.0
30	24 18	6.5	1.7	26.7	15.3	36	. .	265	. .	295	. .	33.8	24 21 20.1	. .	+ 25.7	75 28 7.0	− 0.2
31	51 20	2.5	27.0	20.8	8.3	36	. .	. .	. .	742	778	33.8	51 25 51.2	. .	+ 1 11.0	102 33 23.4	− 4.6
32	66 16	4.3	28.6	24.0	13.5	31	. .	. .	. .	210	140	33.8	66 20 40.7	. .	+ 2 8.7	117 29 10.6	−10.8
33	62 40	5.7	29.0	25.5	13.6	34	. .	534	. .	590	. .	33.8	62 43 47.8	. .	+ 1 49.6	113 51 58.6	−10.6
34	26 10	8.2	3.0	29.0	18.4	32	. .	740	. .	780	. .	33.8	26 14 11.9	. .	+ 28.0	77 21 1.1	− 0.4
35	307 30	4.6	29.2	23.3	14.7	36	504	512	516	520	522	35.1	307 33 19.6	. .	− 1 14.0	358 38 26.8	+ 1.6
36	49 18	9 29.9	25.0	17.3	7.6	29	. .	082	. .	092	. .	35.1	49 23 19.0	. .	+ 1 6.4	100 30 46.6	+ 3.8
37	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
38	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
39	160 5	8 8.4 12 9.1	1.7 3.2	27.9 27.1	18.6 18.6	37	. .	. .	. .	. .	082	35.1	160 8 7.4	61.8	− 20.6	70 58 34.4	− 0.5
40	206 0	10 7.0	29.7	23.7	7.7	32	. .	. .	. .	420	450	35.1	206 4 22.4	. .	+ 28.0	25 1 30.8	− 2.5
41	160 52	4.3	28.4	23.5	12.8	31	574	. .	. .	. .	568	35.1	160 56 35.9	. .	− 19.8	70 10 5.1	+ 1.5
42	193 28	3.1	26.5	21.1	8.0	34	. .	. .	. .	. .	478	35.1	193 31 53.7	. .	+ 13.8	37 34 13.7	− 1.0
43	11 14	0.0	24.8	20.0	7.6	36	. .	354	. .	374	. .	35.1	11 17 27.1	. .	+ 11.4	62 23 59.7	+ 2.4
44	54 20	2.4	26.5	22.5	10.6	34	. .	522	. .	540	. .	35.1	54 23 52.5	. .	+ 1 19.8	105 31 33.5	+ 3.3
45	215 42	5.8	28.2	22.0	11.2	35	128	. .	. .	. .	140	35.1	215 45 42.0	. .	+ 41.2	15 19 58.0	− 4.1
46	324 10	2.0	27.7	21.0	12.8	32	. .	. .	. .	672	698	35.1	324 14 22.8	. .	− 41.2	15 20 2.8	+ 0.7
47	132 8	1.8	27.5	20.1	12.0	33	948	044	. .	. .	. .	35.1	132 12 0.7	. .	− 1 3.1	98 55 23.6	− 2.1
48	47 44	9 24.7	17.6	9.9	1.6	34	. .	. .	. .	400	382	35.1	47 48 4.6	60.5	+ 1 3.1	98 55 28.9	+ 3.2
49	1 0	10 5.2	29.3	25.1	13.2	30	912	878	. .	884	896	35.1	1 4 46.0	. .	+ 1.1	52 11 8.3	+ 2.7

No.	Barom.	At. Ther.
	in.	°
10	30.23	71.5
39	30.12	64.5
48	30.14	63.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
June 9	1	Nemesis . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	2	Amphitrite . .	F.	19.4	22.5	24.5	31.4	34.0	36.3	43.6	45.5	48.5	33 33.97	− 0.89	. .	− 6.83	16 33 26.25	. .
	3	XVI, 19 . . .	F.	32.5	35.3	36.9	43.5	45.5	47.7	54.3	56.2	58.6	39 45.61	− 0.79	. .	− 6.83	16 39 37.99	− 2.58
	4	B. A. C. 5717 . .	F.	4.8	10.0	13.2	25.7	29.8	33.9	46.5	49.5	54.7	52 29.79	+ 0.23	. .	− 6.84	16 52 23.18	− 3.31
	5	B. A. C. 5745 . .	F.	. .	. .	48.5	53.5	58.1	3.4	8.2	. .	. .	55 58.34	+ 0.44	. .	− 6.84	16 55 51.94	− 3.66
	6	B. A. C. 5752 . .	F.	. .	. .	. .	13.6	17.5	21.2	28.8	31.5	36.3	57 13.73	+ 0.11	. .	− 6.84	16 57 7.00	− 3.09
	7	Eugenia . . .	F.	44.5	47.3	48.8	55.3	57.5	59.6	5.9	7.2	9.9	8 57.33	− 0.73	. .	− 6.84	17 8 49.76	. .
	8	44 Ophiuchi . . .	F.	41.3	44.0	45.7	52.4	54.6	56.8	3.7	5.3	8.2	18 54.67	− 0.82	− 6.87	− 6.85	17 18 47.00	+ 0.05
10	9	α Ceti.	Sk.	40.3	42.7	48.3	50.3	52.4	54.6	56.7	2.1	4.7	55 52.46	− 0.51	− 7.15	− 7.11	2 55 44.84	+ 0.06
	10	α Tauri	Sk.	39.6	42.2	43.8	50.1	52.3	54.4	0.7	2.1	5.1	28 52.28	− 0.43	− 7.12	− 7.13	4 28 44.72	− 0.03
11	11	Sun I, N. . . .	Sk.	35.4	38.0	39.7	46.5	48.7	50.9	57.6	59.3	2.1	16 48.69	− 0.38	. .	− 7.16	5 16 41.15	. .
	12	Sun II, S. . . .	Sk.	52.8	55.5	57.4	4.0	6.2	8.4	15.1	16.7	19.6	19 6.19	− 0.38	. .	− 7.16	5 18 58.65	. .
	13	ε Canis Majoris. .	Sk.	36.0	38.9	40.7	47.6	50.0	52.4	59.3	1.0	3.9	53 49.98	− 0.69	− 7.14	− 7.15	6 53 42.14	− 0.06
	14	δ Canis Majoris. .	Sk.	12.1	15.3	16.8	23.6	25.9	28.1	34.9	36.6	39.4	3 25.86	− 0.68	− 7.23	− 7.15	7 3 18.03	+ 0.03
	15	Moon I, N. . .	Sk.	57.0	59.5	1.1	7.3	9.4	11.5	17.6	19.2	21.8	15 9.38	− 0.51	. .	− 7.20	12 15 1.61	+62.02
	16	12 Canum Venat. .	Sk.	4.3	7.6	9.6	17.5	20.0	22.7	30.6	32.6	36.0	50 20.10	− 0.17	− 7.17	− 7.21	12 50 12.72	− 0.04
	17	Polaris, S. P. . .	Sk.	. .	. .	. .	47.5	23.0	55.0	5.0	1.0	14.0	12 49.13	−22.53	. .	− 7.21	1 12 19.39	+ 0.20
	18	α Virginis . . .	Sk.	33.7	36.3	37.8	41.9	43.9	46.0	48.2	50.2	. .	18 46.08	− 0.57	− 7.25	− 7.22	13 18 38.29	+ 0.01
	19	Jupiter I, N. . .	Sk.	40.8	43.3	45.0	. .	. .	. .	1.4	2.9	5.6	22 53.17	− 0.55	. .	− 7.28	13 22 45.34	. .
	20	Jupiter II, S. . .	Sk.	. .	. .	51.7	53.8	55.8	58.0	0.0	. .	. .	22 55.86	− 0.55	. .	− 7.28	13 22 48.03	. .
	21	η Bootis	Sk.	40.6	43.2	44.9	51.3	53.5	55.6	2.2	3.8	6.5	48 53.51	− 0.37	− 7.14	− 7.22	13 48 45.92	− 0.13
13	22	Polaris, S. P. . .	F.	24.0	. .	48.0	22.0	. .	. .	. .	. .	. .	12 56.00	−27.18	. .	− 7.74	1 12 21.08	+ 0.16
	23	α Virginis . . .	F.	34.4	36.9	38.5	44.7	46.8	48.8	55.1	56.6	59.2	18 46.78	− 0.77	− 7.76	− 7.74	13 18 38.27	0.00
	24	ζ Virginis . . .	F.	. .	. .	25.7	27.7	29.7	31.8	33.8	. .	. .	28 29.74	− 0.68	− 7.80	− 7.74	13 28 21.32	+ 0.06
	25	Moon I, N. . .	F.	. .	. .	30.5	32.6	34.8	37.0	39.1	. .	. .	43 34.80	− 0.79	. .	− 7.79	13 43 26.22	+62.50
	26	η Bootis	F.	. .	. .	. .	. .	. .	. .	. .	. . .	7.28	48 54.29	− 0.49	− 7.81	− 7.75	13 48 46.05	+.0.01
	27	ε Bootis	F.	28.3	31.3	33.0	39.8	42.0	44.5	51.3	53.0	56.0	39 42.13	− 0.3	− 7.76	− 7.75	14 39 33.99	− 0.01
	28	α² Libræ	F	55.9	58.7	0.4	4.5	8.7	12.9	17.0	18.6	21.4	44 8.68	− 0.82	− 7.80	− 7.76	14 44 0.10	+ 0.03
	29	β Libræ (R.) . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	30	μ¹ Bootis	F.	41.2	44.4	46.3	54.0	56.5	59.2	6.9	8.9	12.1	19 56.61	− 0.24	− 7.67	− 7.76	15 19 48.61	− 0.10
	31	α Coronæ Bor. (R.) .	F.	. .	. . .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	32	α Coronæ Borealis .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	33	ε Coronæ Borealis .	F.	21.6	24.5	26.1	33.0	35.5	37.8	44.5	46.3	49.1	52 35.38	− 0.39	. .	− 7.77	15 52 27.22	− 0.09
	34	Lalande 29319 .	E.	39.0	42.0	44.0	51.7	54.3	56.9	4.5	6.4	9.6	58 54.27	− 0.25	. .	− 7.82	15 58 46.20	− 2.57
	35	Lalande 29403 .	E.	13.6	16.7	18.7	26.4	28.9	31.5	39.1	41.0	44.3	1 28.91	− 0.25	. .	− 7.82	16 1 20.84	− 2.58
	36	Lalande 29433 .	E.	50.0	53.0	55.0	2.7	5.3	7.9	15.5	17.5	20.6	2 5.28	− 0.25	. .	− 7.82	16 1 57.21	− 2.58
	37	Lalande 29685 .	F.	10.5	13.6	15.4	23.0	25.7	28.3	35.9	37.8	41.1	10 25.70	− 0.25	. .	− 7.75	16 10 17.70	− 2.58
	38	Lalande 29708 .	F.	13.4	16.7	18.6	26.0	28.6	31.1	38.9	40.9	44.0	11 28.69	− 0.25	. .	− 7.75	16 11 20.69	− 2.58
	39	α Scorpii	F.	42.4	45.2	46.9	53.6	56.0	58.3	5.0	6.8	9.5	21 35.97	− 0.93	− 7.63	− 7.77	16 21 47.27	− 0.15
	40	ζ Ophiuchi . . .	F.	15.2	17.9	19.5	25.7	27.7	29.7	35.9	37.5	40.0	30 27.68	− 0.77	− 7.80	− 7.77	16 30 19.14	+ 0.03
	41	η Herculis . . .	F.	31.5	34.9	36.5	44.7	47.3	49.9	57.9	59.8	3.0	38 47.28	− 0.21	− 7.79	− 7.77	16 38 39.30	+ 0.03
	42	B. A. C. 5740 . .	F.	. .	. .	26.4	31.7	36.6	41.5	51.3	55.0	0.9	55 31.59	+ 0.63	. .	− 7.73	16 55 24.49	− 3.65
	43	B. A. C. 5752 . .	F.	. .	. .	. .	14.8	18.7	22.4	30.0	32.7	37.3	57 14.91	+ 0.22	. .	− 7.73	16 57 7.40	− 3.09
	44	Eugenia . . .	F.	. .	. .	. .	. .	. .	31.2	35.3	37.0	39.4	5 26.96	− 0.79	. .	− 7.73	17 5 18.44	. .
16	45	θ Virginis . . .	E.	27.5	29.9	31.6	37.7	39.8	41.9	47.9	49.5	52.0	3 39.76	− 0.66	− 8.77	− 8.65	13 3 30.45	+ 0.08
	46	Polaris, S. P. . .	E.	. .	. .	49.0	22.5	58.0	32.0	7.5	. .	. .	12 57.80	−25.46	. .	− 8.65	1 12 23.69	− 0.14
	47	α Virginis . . .	E.	35.1	37.8	39.4	45.6	47.6	49.7	56.0	57.5	0.1	18 47.64	− 0.71	− 8.71	− 8.66	13 18 38.27	+ 0.03
	48	Jupiter I, S. . .	E.	25.3	27.9	29.4	. .	. .	. .	45.8	47.4	49.9	22 37.62	− 0.68	. .	− 8.63	13 22 28.31	. .
	49	Jupiter II, N. . .	E.	. . .	. .	36.4	38.5	40.5	42.5	44.5	. .	. .	22 40.48	− 0.68	. .	− 8.63	13 22 31.17	. .

1, 37. Wire B used.
2, 7, 38, 44. Wire A used.
4, 5, 15, 17, 42. Bisections at sets B and D.
18, 30. Telescope micrometer reading decreased five revolutions in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	56 12	10 4.6	28.7	24.7	13.5	20	. .	. .	. .	640	634	35.1	56 16 50.4	. .	+ 1 25.7	107 24 37.3	− 3.7
2	70 18	9 29.5	22.7	18.0	7.9	37	660	680	. .	. .	. .	35.1	70 23 40.3	. .	+ 2 40.0	121 32 41.5	− 4.8
3	58 40	10 0.7	23.5	20.7	9.0	32	. .	134	. .	186	. .	35.1	58 44 30.8	. .	+ 1 34.4	109 52 26.4	−12.9
4	338 16	5.0	27.6	22.8	11.7	32	282	. .	. .	. .	292	35.1	338 20 25.9	. .	− 22.8	29 26 24.3	− 8.8
5	333 36	1.5	24.4	19.9	9.0	32	. .	020	. .	016	. .	35.1	333 40 33.0	. .	− 28.4	24 46 25.8	− 8.8
6	341 58	5.6	0.3	25.3	15.6	34	. .	. .	. .	660	680	35.1	342 1 47.9	. .	− 18.6	33 7 50.5	− 9.2
7	51 20	4.0	26.5	22.9	10.5	41	. .	724	. .	732	. .	35.1	51 24 34.8	. .	+ 1 12.0	102 32 8.0	− 4.6
8	62 52	4.4	27.4	23.5	11.9	36	. .	108	. .	166	. .	35.1	62 55 26.6	. .	+ 1 52.0	114 3 39.8	+ 2.0
9	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
10	22 34	1.7	28.0	24.9	10.5	34	. .	550	. .	600	. .	33.5	22 37 49.7	81.0	+ 23.0	73 44 33.9	+ 4.6
11	15 28	3.0	28.9	25.8	9.7	35	840	880	. .	. .	. .	33.5	15 31 29.2	. .	+ 15.3	66 38 5.7	. .
12	16 0	1.9	27.0	22.7	8.8	37	. .	. .	. .	840	896	33.5	16 3 1.0	82.8	+ 15.8	67 9 38.0	. .
13	67 36	0.6	24.7	21.0	8.5	35	. .	488	. .	550	. .	33.5	67 39 37.6	. .	+ 2 12.0	118 48 10.8	+ 0.7
14	65 0	2.0	25.2	23.4	9.0	36	. .	022	. .	170	. .	33.5	65 3 27.6	85.2	+ 1 56.9	116 11 45.7	+ 2.5
15	39 48	0.5	24.7	20.7	6.8	35	172	. .	072	. .	980	35.2	39 51 46.8	77.6	+ 46.2	90 58 54.2	. .
16	359 50	4.0	1.5	25.0	10.5	33	850	890	. .	. .	. .	35.2	359 54 0.7	. .	− 0.1	51 0 21.8	+ 2.3
17	307 30	3.4	1.0	25.0	13.5	36	. .	. .	. .	610	470	35.2	307 33 17.0	. .	− 1 12.2	358 38 26.0	+ 1.0
18	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	.	. . . .	. .	. .	. . . .	. .
19	46 4	3.2	28.1	24.5	9.3	37	. .	370	. .	384	. .	35.2	46 7 8.4	. .	+ 57.8	97 14 27.4	. .
20	46 4	3.2	28.1	24.5	9.3	31	660	. .	. .	. .	790	35.2	46 7 48.9	. .	+ 57.8	97 15 7.9	. .
21	19 48	6.0	3.0	29.5	14.0	33	. .	962	. .	950	. .	35.2	19 51 56.6	. .	+ 20.1	70 58 37.9	+ 3.3
22	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
23	49 18	9 28.2	23.2	17.3	6.6	34	. .	. .	. .	246	252	34.7	49 23 17.6	. .	+ 1 6.3	100 30 45.1	+ 2.5
24	38 46	10 0.0	23.5	17.5	7.7	32	. .	. .	. .	492	500	34.7	38 50 27.1	. .	+ 45.9	89 57 34.2	+ 2.5
25	51 18	5.8	28.9	23.5	12.3	26	. .	520	196	856	. .	34.7	51 23 57.8	. .	+ 1 11.3	102 31 30.3	. .
26	19 48	3.7	27.8	24.5	11.5	34	. .	. .	. .	290	296	34.7	19 51 55.0	61.8	+ 20.6	70 58 36.8	+ 2.4
27	11 14	8.0	1.4	28.6	17.1	35	908	892	. .	. .	. .	34.7	11 17 25.5	. .	+ 11.4	62 23 58.1	+ 1.5
28	54 20	3.9	26.1	22.3	12.6	34	. .	512	. .	576	. .	34.7	54 23 51.3	. .	+ 1 20.0	105 31 32.5	+ 2.3
29	132 8	1.3	25.6	19.7	11.2	34	. .	. .	. .	248	282	34.7	132 11 57.8	58.4	− 1 3.3	98 55 26.7	+ 1.2
30	1 0	5.2	29.3	26.0	14.0	35	. .	880	. .	892	. .	34.7	1 4 45.2	. .	+ 1.1	52 11 7.5	+ 2.9
31	168 10	3.5	26.7	22.7	11.6	31	432	442	. .	. .	. .	34.7	168 14 38.4	. .	− 12.0	62 51 54.8	+ 0.2
32	11 42	3.6	28.0	26.4	12.4	36	. .	. .	. .	294	314	34.7	11 45 23.6	. .	+ 12.0	62 51 56.8	+ 2.6
33	11 34	4.0	29.5	26.8	14.3	29	. .	400	. .	414	. .	34.7	11 39 7.7	58.0	+ 11.9	62 45 40.8	+ 2.3
34	1 52	9 29.0	29.5	25.8	13.3	37	. .	465	. .	505	. .	34.7	1 55 5.9	. .	+ 1.9	53 1 29.0	− 6.8
35	1 52	29.0	29.5	25.8	13.3	28	235	295	. .	. .	. .	34.7	1 57 26.5	. .	+ 2.0	53 3 49.7	− 6.9
36	1 52	29.0	29.5	25.8	13.3	23	. .	. .	. .	000	035	34.7	1 58 47.9	. .	+ 2.0	53 5 11.1	− 7.0
37	1 52	29.0	29.5	25.8	13.3	33	598	578	. .	. .	. .	34.7	1 53 32.4	. .	+ 1.9	52 59 55.5	− 7.3
38	1 52	29.0	29.5	25.8	13.3	21	. .	276	. .	290	. .	34.7	2 1 46.9	. .	+ 2.0	53 8 10.1	− 7.3
39	64 56	10 9.3	2.6	29.0	19.5	29	. .	642	. .	670	. .	34.7	65 0 59.6	. .	+ 2 2.9	116 9 23.7	+ 0.6
40	49 8	9 29.5	23.3	16.5	6.8	36	. .	268	. .	278	. .	34.7	49 11 29.5	. .	+ 1 6.6	100 18 57.3	+ 2.9
41	359 40	10 4.3	28.9	27.0	13.7	33	. .	346	. .	340	. .	34.7	359 41 7.8	57.2	− 0.3	50 50 28.7	+ 1.9
42	333 30	4.6	29.2	24.3	13.6	31	. .	. .	. .	004	020	34.7	333 34 44.0	. .	− 23.7	24 40 36.5	− 7.4
43	341 58	4.5	28.8	24.5	13.8	34	. .	. .	. .	816	832	34.7	342 1 46.2	. .	− 18.7	33 7 48.7	− 7.9
44	51 20	4.5	26.6	23.3	10.8	38	. .	. .	. .	790	806	34.7	51 25 19.2	. .	+ 1 12.3	102 32 52.7	− 4.5
45	43 40	4.2	27.0	23.5	11.2	29	. .	110	. .	120	. .	35.3	43 45 14.7	. .	+ 53.6	94 52 29.5	+ 2.5
46	307 30	9 28.8	26.0	18.5	9.3	36	970	. .	980	. .	940	35.3	307 33 17.7	. .	− 1 13.0	358 38 25.9	+ 1.3
47	49 18	29.3	26.5	20.5	8.7	28	. .	960	. .	000	. .	35.3	49 23 19.5	69.0	+ 1 5.3	100 30 46.0	+ 3.4
48	46 4	10 4.0	27.9	23.3	11.7	35	645	. .	. .	. .	760	35.3	46 7 33.6	. .	+ 53.2	97 14 53.0	. .
49	46 4	4.0	27.9	23.3	11.7	38	. .	330	. .	375	. .	35.3	46 6 53.0	. .	+ 53.2	97 14 12.4	. .

No.	Barom.	At. Ther.
	in.	°
10	30.19	78.5
12	30.19	80.0
14	30.16	84.4
15	30.11	78.6
26	30.09	64.5
29	30.10	61.0
33	30.10	61.0
41	30.12	60.0
47	29.98	71.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
11	− 2.3	+ 15 46.1	. .	+ 15 43.8
12	− 2.4	− 15 46.1	. .	− 15 48.5
15	−35 8.4	+ 15 2.6	. .	− 20 5.8
19	− 1.3	+ 20.3	. .	+ 19.0
20	− 1.3	− 20.2	. .	− 21.5
25	−42 15.0	+ 14 48.9	. .	− 27 26.1
48	− 1.3	− 20.3	. .	− 21.6
49	− 1.3	+ 20.3	. .	+ 19.0

DATE.	Number.		OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
					I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.														m. s.	s.	s.	s.	h. m. s.	s.
June 16	1	ζ	Virginis . . .	E.	18.3	20.8	22.3	28.4	30.5	32.5	38.6	40.0	42.7	28 30.46	− 0.62	− 8.60	− 8.66	13 28 21.18	− 0.06
	2	η	Ursæ Majoris (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	3	η	Ursæ Majoris . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	4	η	Bootis	E.	42.0	44.8	46.4	52.8	55.0	57.1	3.7	5.3	8.0	48 55.01	− 0.45	− 8.59	− 8.66	13 48 45.90	− 0.12
	5	α	Draconis (R.) . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	6	α	Draconis . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	7	ι	Cassiopeæ, S. P. .	E.	28.5	21.0	18.0	2.4	57.3	52.0	36.5	32.4	25.7	18 57.16	− 2.13	. .	− 8.67	2 18 46.36	+ 0.44
	8	5	Ursæ Minoris . .	E.	10.0	20.7	27.0	52.8	1.7	9.8	35.9	41.8	52.7	28 1.38	+ 1.67	. .	− 8.68	14 27 54.37	+ 0.09
	9		B. A. C. 4996 . .	E.	12.0	15.0	17.0	24.5	27.0	29.6	37.0	39.0	42.0	5 27.01	− 0.94	. .	− 8.67	15 5 17.40	− 2.43
	10		B. A. C. 5054 . .	E.	49.8	52.0	55.0	2.4	5.0	7.5	15.0	16.9	20.0	14 4.94	− 0.94	. .	− 8.67	15 13 55.33	− 2.49
	11		B. A. C. 5069 . .	E.	11.0	14.1	16.0	23.8	26.5	29.0	36.8	38.8	42.0	17 26.44	− 0.97	. .	− 8.68	15 17 16.79	− 2.56
	12		B. A. C. 5118 . .	E.	45.4	48.0	50.6	58.6	1.3	4.2	12.2	14.4	17.7	27 1.44	− 0.99	. .	− 8.68	15 26 51.77	− 2.68
	13	α	Coronæ Borealis .	E.	21.4	24.4	26.0	32.9	35.0	37.5	44.4	46.0	49.0	29 35.18	− 0.37	− 8.65	− 8.70	15 29 26.11	− 0.05
	14	α	Serpentis . . .	E.	6.0	8.6	10.0	16.2	18.3	20.4	26.5	28.0	30.6	38 18.29	− 0.56	− 8.70	− 8.70	15 38 9.03	+ 0.02
	15	ε	Serpentis . . .	E.	34.0	37.0	38.7	44.8	46.8	48.8	55.0	56.6	59.0	44 46.81	− 0.58	− 8.72	− 8.70	15 44 37.53	+ 0.02
	16		Lalande 28969. .	E.	37.2	39.7	41.2	45.5	47.5	49.6	51.6	53.7	. .	48 49.56	− 0.54	. .	− 8.69	15 48 40.33	− 2.34
	17		Lalande 28975. .	E.	. .	54.9	57.0	59.0	1.0	3.1	7.3	8.8	11.4	48 59.00	− 0.54	. .	− 8.69	15 48 49.77	− 2.34
	18		Weisse 983 . .	E.	52.4	55.0	56.6	2.8	4.9	7.0	13.2	14.7	17.3	53 4.88	− 0.54	. .	− 8.70	15 52 55.64	− 2.35
	19		Lalande 29122. .	E.	4.0	6.6	8.1	14.4	16.5	18.6	24.7	26.3	28.9	54 16.46	− 0.54	. .	− 8.70	15 54 7.22	− 2.36
	20		Lalande 29334. .	E.	8.5	11.0	12.5	18.8	20.9	22.9	29.1	30.7	33.4	0 20.87	− 0.54	. .	− 8.70	16 0 11.63	− 2.37
	21		Lalande 29417 .	E.	25.8	28.4	30.0	34.0	36.1	38.1	40.3	. .	. .	2 38.19	− 0.54	. .	− 8.70	16 2 28.95	− 2.37
	22		Lalande 29423 .	E.	. .	. .	42.8	44.8	46.9	. .	. .	. .	. .	2 46.91	− 0.54	. .	− 8.70	16 2 37.67	− 2.37
	23		Moon I, N. . . .	E.	32.6	35.5	37.0	44.2	46.6	48.9	55.7	57.5	0.5	8 46.50	− 0.84	. .	− 8.70	16 8 36.96	+67.57
	24	γ²	Ursæ Minoris, S.P.	F.	. .	. .	26.3	19.8	12.5	5.7	59.0	. .	. .	21 12.66	− 2.49	. .	− 8.95	15 21 1.22	+ 0.05
	25	η	Tauri	F.	59.0	1.9	3.6	10.3	12.6	14.7	21.5	23.0	25.9	40 12.50	− 0.28	− 8.92	− 8.95	3 40 3.27	− 0.03
	26	ζ	Persei	F.	11.2	14.3	16.3	23.4	25.6	28.0	35.1	36.8	40.0	46 25.63	− 0.16	− 8.99	− 8.95	3 46 16.52	+ 0.03
	27	γ¹	Eridani. . . .	F.	. .	. .	17.0	19.3	21.6	23.7	26.0	. .	. .	52 21.52	− 0.68	− 9.04	− 8.95	3 52 11.88	+ 0.12
	28	α	Tauri	F.	44.0	45.7	49.9	52.0	54.1	56.2	58.4	2.5	4.2	28 54.11	− 0.37	− 8.90	− 8.96	4 28 44.78	− 0.08
	29	ι	Aurigæ. . . .	F.	45.7	48.7	50.5	57.9	0.4	2.6	10.0	11.7	14.9	49 0.27	− 0.14	− 9.08	− 8.97	4 48 51.16	+ 0.07
	30	α	Aurigæ	F.	18.5	22.0	24.4	33.0	36.0	38.9	47.7	49.8	53.5	7 35.98	+ 0.10	. .	− 8.97	5 7 27.11	+ 0.06
	31	β	Orionis. . . .	F.	28.9	31.5	33.0	39.1	41.3	43.4	49.5	51.0	53.7	8 41.27	− 0.62	− 9.04	− 8.97	5 8 31.68	+ 0.07
	32	β	Tauri	F.	18.4	21.4	23.2	30.3	32.5	34.7	41.8	43.4	46.3	18 32.44	− 0.21	− 8.97	− 8.97	5 18 23.26	− 0.02
	33	δ	Orionis. . . .	F.	34.3	37.0	38.4	42.6	44.5	46.5	48.6	50.5	. .	25 46.57	− 0.55	− 8.95	− 8.98	5 25 37.04	− 0.06
17	34		Sun I, S. . . .	F.	31.3	34.2	35.8	42.4	44.7	47.0	53.6	55.3	58.0	41 44.70	− 0.28	. .	− 8.97	5 41 35.45	. .
	35		Sun II, N. . . .	F.	49.5	52.0	53.6	0.4	2.7	4.9	11.4	13.2	15.9	44 2.62	− 0.28	. .	− 8.97	5 43 53.37	. .
	36	γ	Geminorum . .	F.	25.9	28.6	30.2	. .	. .	. .	47.2	48.8	51.5	30 38.70	− 0.37	− 8.96	− 8.99	6 30 29.34	− 0.06
	37	α	Canis Majoris. .	F.	. .	. .	43.3	45.3	47.5	49.6	51.8	. .	. .	39 47.50	− 0.68	− 8.98	− 8.99	6 39 37.83	− 0.05
	38	β	Geminorum . .	F.	35.3	38.0	39.9	46.8	49.1	51.5	58.5	0.2	3.0	37 49.14	− 0.21	− 8.90	− 9.00	7 37 39.93	− 0.13
18	39	ζ	Persei	Sk.	. .	. .	21.3	23.7	25.9	28.4	30.7	. .	. .	46 26.00	− 0.28	− 9.18	− 9.04	3 46 16.68	+ 0.13
	40	α	Tauri	Sk.	41.7	44.3	45.9	52.3	54.3	56.5	2.9	4.4	7.2	28 54.39	− 0.48	− 9.03	− 9.05	4 28 44.86	− 0.04
19	41		Sun I, N. . . .	Sk.	50.5	53.5	55.1	1.8	4.0	6.1	13.0	14.7	17.5	50 4.02	− 0.39	. .	− 9.15	5 49 54.48	. .
	42		Sun II, S. . . .	Sk.	8.3	11.3	13.1	19.7	21.9	24.0	30.7	32.4	35.2	52 21.84	− 0.39	. .	− 9.15	5 52 12.30	. .
	43	α	Canis Minoris .	Sk.	42.9	45.5	47.0	51.2	53.0	55.0	. .	. .	. .	32 55.18	− 0.59	− 9.20	− 9.07	7 32 45.52	− 0.03
	44	β	Geminorum . .	Sk.	35.6	38.4	40.2	47.2	49.5	51.8	58.8	0.7	3.6	37 49.53	− 0.32	− 9.18	− 9.07	7 37 40.14	+ 0.08
	45	ζ	Ophiuchi . . .	Sk.	16.5	19.0	20.7	26.9	29.0	31.1	37.4	38.9	41.5	30 29.00	− 0.79	− 9.05	− 9.14	16 30 19.07	− 0.09
	46	η	Herculis . . .	Sk.	32.7	36.0	38.0	46.0	48.6	51.3	59.1	1.2	4.5	38 48.60	− 0.21	− 9.10	− 9.14	16 38 39.25	− 0.03
	47		XVII, 21 . . .	Sk.	30.4	33.6	35.4	42.9	45.4	48.0	55.2	57.0	59.9	44 45.31	− 1.04	. .	− 9.06	17 44 35.21	− 3.16
	48		Mars I, N. . . .	Sk.	39.0	42.0	43.7	. .	. .	. .	2.1	3.9	6.7	53 52.90	− 0.96	. .	− 9.06	17 53 42.88	+ 0.98
	49		Mars II, S.. . .	Sk.	. .	. .	50.2	52.6	54.9	57.1	59.5	. .	. .	53 54.86	− 0.96	. .	− 9.06	17 53 44.84	− 0.98

5. Bisections at wires C_5 and D_3.
8, 24. Bisections at sets B and D.
18, 20. Wire A used.
24. Telescope micrometer readings increased one revolution in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	38 46	9 29.8	24.0	18.3	6.3	32	. .	445	. .	465	. .	35.3	38 50 28.0	. .	+ 45.1	89 57 34.3	+ 2.9
2	190 58	10 0.3	25.3	20.8	6.7	32	195	245	. .	. .	. .	35.3	191 2 29.4	. .	+ 11.0	40 3 40.8	− 0.5
3	348 54	9 26.5	23.3	16.4	6.3	36	. .	. .	. .	185	215	35.3	348 57 33.1	. .	− 11.0	40 3 43.3	+ 2.0
4	19 48	29.5	26.4	21.8	7.8	34	. .	430	. .	470	. .	35.3	19 51 55.8	. .	+ 20.3	70 58 37.3	+ 3.3
5	206 0	10 9.0	3.7	27.6	12.8	32	. .	. .	. .	110	070	35.3	206 4 24.9	. .	+ 27.5	25 1 28.8	− 3.3
6	333 52	7.5	4.5	29.0	18.6	35	. .	. .	. .	300	355	35.3	333 55 35.2	. .	− 27.5	25 1 28.9	− 3.2
7	285 44	9 28.7	23.6	16.1	5.5	37	. .	405	. .	470	. .	35.3	285 47 12.1	. .	− 3 15.7	336 50 17.6	+ 3.4
8	322 36	29.2	24.5	18.8	8.0	37	290	. .	275	. .	310	35.3	322 39 13.7	. .	− 42.9	13 44 52.0	+ 0.2
9	74 24	10 3.5	26.0	21.0	9.0	34	. .	. .	. .	985	955	35.3	74 27 46.7	. .	+ 3 20.0	125 37 27.9	−19.3
10	74 34	0.6	24.5	17.7	9.7	30	. .	390	. .	475	. .	35.3	74 38 57.7	. .	+ 3 22.1	125 48 41.0	−19.0
11	77 4	4.3	27.5	19.8	11.3	36	. .	. .	. .	865	810	35.3	77 7 17.2	. .	+ 4 1.2	128 17 39.6	−19.3
12	79 30	5.7	29.2	22.3	12.9	34	. .	955	. .	065	. .	35.3	79 33 43.2	65.5	+ 4 56.1	130 45 0.5	−19.2
13	11 42	2.0	26.7	22.2	10.2	36	. .	590	. .	505	. .	35.3	11 45 22.3	. .	+ 11.8	62 51 55.3	+ 1.3
14	32 0	0.2	24.0	16.5	7.0	34	. .	010	. .	080	. .	35.3	32 4 3.9	. .	+ 35.4	83 11 0.5	+ 4.2
15	33 58	9 28.6	23.3	16.5	6.5	34	. .	770	. .	805	. .	35.3	34 1 53.2	. .	+ 38.2	85 8 52.6	+ 2.0
16	29 52	27.8	22.8	17.5	5.5	33	200	210	. .	. .	. .	35.3	29 56 17.5	. .	+ 32.6	81 3 11.3	−10.2
17	29 52	27.8	22.8	17.5	5.5	34	070	110	. .	. .	. .	35.3	29 56 3.9	. .	+ 32.6	81 2 57.7	−10.2
18	29 52	27.8	22.8	17.5	5.5	36	680	700	. .	. .	. .	35.3	29 57 57.0	. .	+ 32.7	81 4 50.9	−10.2
19	29 52	27.8	22.8	17.5	5.5	39	380	460	. .	. .	. .	35.3	29 54 42.3	. .	+ 32.6	81 1 36.1	−10.2
20	29 52	27 8	22.8	17.5	5.5	39	480	510	. .	. .	. .	35.3	29 57 14.1	. .	+ 32.7	81 4 8.0	−10.3
21	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
22	29 52	27.8	22.8	17 5	5.5	32	. .	. .	. .	570	610	35.3	29 56 27.5	. .	+ 32.7	81 3 21.4	−10.3
23	64 20	29.8	27.5	21.3	9.8	33	280	220	090	920	810	35.3	64 24 16.0	65 0	+ 1 57.3	115 32 34.5	. .
24	291 8	27.8	22.3	16.9	8.1	30	. .	190	. .	306	. .	33.2	291 12 45.1	. .	− 2 22.4	342 16 43.9	− 0.3
25	15 6	29.8	23.4	20.4	9.3	32	. .	. .	. .	954	970	33.2	15 10 17.6	. .	+ 15.1	66 16 53.9	+ 1.2
26	7 18	26.8	22.8	19.0	6.8	30	. .	986	. .	018	. .	33.2	7 22 49.1	. .	+ 7.2	58 29 17.5	+ 0.7
27	52 40	10 4.0	27.2	25.3	12.7	33	. .	. .	. .	178	162	33.2	52 44 9.9	74.8	+ 1 12.9	103 51 44.0	+ 2.2
28	22 34	0.3	24.1	20.4	9.4	34	. .	778	. .	792	. .	33.2	22 37 48.8	. .	+ 23.1	73 44 33.1	+ 4.2
29	5 52	1.3	26.2	22.7	9.1	35	. .	802	. .	824	. .	33.2	5 55 32.0	. .	+ 5.7	57 1 58.9	+ 4.0
30	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
31	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
32	10 20	9 28.3	23.0	21.4	10.3	36	. .	340	. .	400	. .	33.2	10 23 25.0	. .	+ 10.1	61 29 56.3	+ 2.9
33	39 12	29.7	22.9	19.2	7.3	32	. .	. .	. .	666	650	33.2	39 16 23.0	78.5	+ 44.8	90 23 29.0	+ 1.2
34	15 42	10 0.8	27.7	21.5	8.9	36	556	572	. .	. .	. .	33.2	15 45 20.2	. .	+ 15.5	66 51 56.9	. .
35	15 10	3.1	27.8	25.5	10.0	34	. .	. .	. .	622	632	33.2	15 13 48.7	79.3	+ 15.0	66 20 24.9	. .
36	22 18	2.6	26.1	20.0	10.4	30	. .	. .	. .	168	226	33.2	22 22 58.3	. .	+ 22.6	73 29 42.1	+ 5.1
37	55 20	9 27.0	21.3	15.3	5.6	29	. .	986	. .	996	. .	33.2	55 25 5.8	. .	+ 1 19.5	106 32 46.5	+ 3.5
38	10 30	10 3.7	28.8	24.8	14.8	34	. .	. .	. .	572	582	33.2	10 33 48.1	81.2	+ 10.2	61 40 19.5	+ 3.0
39	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
40	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
41	15 8	3.4	28.1	24.5	15.6	36	852	879	. .	. .	. .	33.4	15 11 12.7	. .	+ 15.0	66 17 48.9	. .
42	15 38	9 29.4	23.9	19.3	8.7	31	. .	. .	. .	231	260	33.4	15 42 44.6	76.7	+ 15.6	66 49 21.4	. .
43	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
44	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
45	49 8	10 3.5	27.0	20.6	7.9	35	. .	959	. .	019	. .	33.5	49 11 29.4	67.6	+ 1 5.3	100 18 55.9	+ 1.9
46	359 40	5.0	1.6	27.8	13.3	33	. .	350	. .	380	. .	33.5	359 44 5.2	. .	− 0.3	50 50 26.1	+ 0.9
47	72 52	5.0	28.7	22.7	11.8	35	. .	350	. .	358	. .	33.5	72 55 36.6	. .	+ 3 1.9	124 4 59.7	− 9.5
48	66 12	3.0	28.7	26.5	11.8	37	. .	278	. .	360	. .	33.5	66 15 6.2	. .	+ 2 7.8	117 23 35.2	. .
49	66 12	3.0	28.7	26.5	11.8	35	534	. .	. .	. .	750	33.5	66 15 31.6	. .	+ 2 7.9	117 24 0.7	. .

No.	Barom.	At. Ther.
	in.	°
23	29.98	67.0
27	30.06	73.5
33	30.05	76.0
35	30.04	77.0
38	30.01	81.0
42	30.08	73.6
45	30.12	69.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
23	−48 39.5	+ 14 46.2	. .	− 33 53.3
34	− 2.3	− 15 46.0	. .	− 15 48.3
35	− 2.3	+ 15 46.0	. .	+ 15 43.7
41	− 2.3	+ 15 46.2	. .	+ 15 43.9
42	− 2.4	− 15 46.2	. .	− 15 48.6
48	− 18.4	+ 12.8	− 0.1	− 5.7
49	− 18.4	− 12.8	. .	− 31.2

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
June 19	1	δ Ursæ Minoris. .	Sk.	. .	. .	45.0	19.5	52.5	26.0	1.0	. .	. .	12 52.80	−10.29	. .	− 9.15	18 12 53.94	− 0.30
	2	α Lyræ	Sk.	38.4	41.6	43.8	51.4	54.1	56.7	4.4	6.4	9.5	32 54.03	− 0.22	− 8.98	− 9.16	18 32 44.65	− 0.16
	3	β Lyræ	Sk.	25.0	28.1	30.0	37.3	39.7	42.2	49.5	51.3	54.3	45 39.71	− 0.31	− 9.12	− 9.16	18 45 30.24	− 0.01
	4	Moon II, S. . .	Sk.	12.0	15.0	16.8	23.7	26.1	28.6	35.8	37.7	40.5	58 26.24	− 0.98	. .	− 9.05	18 58 16.21	−70.45
20	5	η Tauri	F.	. .	. .	. .	13.4	15.9	18.0	22.4	24.1	27.0	40 13.53	− 0.34	− 9.79	− 9.71	3 40 3.48	+ 0.08
	6	γ Eridani . . .	F.	12.3	13.8	18.1	20.3	22.4	24.4	26.6	30.7	32.3	52 22.32	− 0.65	− 9.79	− 9.71	3 52 11.96	+ 0.12
	7	α Aurigæ. . . .	F.	19.4	23.1	26.3	34.0	37.0	40.0	48.8	51.0	54.6	7 37.02	− 0.02	. .	− 9.72	5 7 27.28	+ 0.14
	8	β Orionis. . . .	F.	29.6	32.1	33.8	40.0	42.0	44.0	50.4	51.9	54.5	8 42.03	− 0.61	− 9.76	− 9.72	5 8 31.70	+ 0.04
21	9	Sun I, S. . . .	F.	10.2	12.9	14.4	21.3	23.4	25.7	32.4	34.1	36.7	58 23.46	− 0.34	. .	− 9.72	5 58 13.40	. .
	10	Sun II, N. . . .	F.	28.0	30.8	32.6	39.2	41.4	43.5	50.3	52.0	54.8	0 41.40	− 0.34	. .	− 9.72	6 0 31.34	. .
	11	Mercury I, N. . .	F.	52.7	55.3	57.0	3.4	5.6	7.8	14.4	16.0	18.9	24 5.68	− 0.37	. .	− 9.68	7 23 55.63	+ 0.38
	12	α² Geminorum . .	F.	33.0	35.9	37.9	45.0	47.5	49.7	57.2	58.8	1.8	26 47.42	− 0.23	− 9.77	− 9.74	7 26 37.45	+ 0.27
	13	α Canis Minoris .	F.	43.3	45.8	47.4	53.5	55.6	57.6	3.9	5.4	7.8	32 55.59	− 0.54	− 9.60	− 9.74	7 32 45.31	− 0.25
	14	β Geminorum . .	F.	36.0	39.0	40.7	47.6	49.9	52.4	59.2	1.0	4.0	37 49.98	− 0.28	− 9.66	− 9.75	7 37 39.95	− 0.12
22	15	α Tauri	Sk.	42.5	45.0	46.7	53.0	55.2	57.4	3.6	5.4	8.0	28 55.20	− 0.38	− 9.86	− 9.82	4 28 45.00	+ 0.02
	16	ι Aurigæ. . . .	Sk.	. .	. .	. .	. .	. .	. .	11.3	13.0	16.2	49 1.52	− 0.25	−10.09	− 9.82	4 48 51.45	+ 0.23
23	17	Sun I, N. . . .	Sk.	29.2	32.0	33.8	40.4	42.6	45.0	51.5	53.1	56.2	6 42.64	− 0.33	. .	− 9.90	6 6 32.41	. .
	18	Sun II, S. . . .	Sk.	47.0	49.9	51.5	58.2	0.5	2.6	9.3	11.0	13.8	9 0.42	− 0.33	. .	− 9.90	6 8 50.19	. .
	19	α Canis Minoris .	Sk.	43.5	45.9	47.5	53.6	55.8	57.8	4.0	5.5	8.0	32 55.73	− 0.44	− 9.88	− 9.86	7 32 45.43	− 0.14
	20	β Geminorum . .	Sk.	36.1	39.2	41.0	47.7	50.0	52.4	59.4	1.2	4.0	37 50.11	− 0.29	− 9.77	− 9.86	7 37 39.96	− 0.12
	21	θ Virginis . . .	F.	. .	. .	. .	. .	. .	. .	49.0	50.5	53.3	3 40.86	− 0.57	−10.02	−10.05	13 3 30.24	− 0.07
	22	Polaris, S. P. . .	F.	. .	. .	50.0	24.0	57.0	30.0	3.0	. .	. .	12 56.80	−17.01	. .	−10.05	1 12 29.74	− 0.18
	23	α Virginis . . .	F.	36.2	38.8	40.3	46.7	48.8	50.7	57.0	58.6	1.2	18 48.70	− 0.59	− 9.94	−10.06	13 18 38.05	− 0.14
	24	Jupiter I, S. . .	F.	31.0	33.7	35.1	. .	. .	. .	51.5	53.0	55.6	22 43.32	− 0.58	. .	− 9.95	13 22 32.79	. .
	25	Jupiter II, N. . .	F.	. .	. .	41.8	43.9	45.9	48.0	50.1	. .	. .	22 45.94	− 0.58	. .	− 9.95	13 22 35.41	. .
	26	ζ Virginis . . .	F.	19.5	22.0	23.5	29.7	31.7	33.7	39.9	41.5	44.0	28 31.72	− 0.55	− 9.98	−10.06	13 28 21.11	− 0.08
	27	η Bootis	F.	43.4	46.1	47.6	54.1	56.3	58.5	5.0	6.5	9.2	48 56.30	− 0.47	− 9.93	−10.07	13 48 45.76	− 0.19
	28	Moon II, N. . .	Sk.	56.7	59.4	1.0	7.4	9.6	11.9	18.1	19.7	22.5	33 9.59	− 0.47	. .	−10.10	22 32 59.02	−65.90
	29	ζ Pegasi	Sk.	13.5	16.0	17.6	23.7	25.9	28.0	34.0	35.6	38.2	35 25.83	− 0.38	−10.11	−10.06	22 35 15.39	+ 0.11
	30	α Piscis Australis .	Sk.	43.0	46.0	47.8	55.0	57.3	59.6	6.7	8.5	11.5	50 57.27	− 0.54	−10.13	−10.07	22 50 46.66	+ 0.10
	31	α Pegasi	Sk.	31.4	34.0	35.6	41.9	44.0	46.2	52.5	54.0	56.8	58 44.04	− 0.36	−10.06	−10.07	22 58 33.61	+ 0.02
	32	λ Draconis, S. P. .	Sk.	. .	. .	. .	17.6	11.7	5.6	47.5	43.2	. .	24 11.57	− 1.58	. .	−10.07	11 23 59.92	+ 0.16
	33	γ Cephei	Sk.	28.3	40.2	46.3	13.5	22.8	31.6	58.8	5.0	16.6	34 22.57	+ 1.04	. .	−10.08	23 34 13.53	+ 0.23
	34	α Andromedæ . .	Sk.	53.2	56.1	57.9	4.8	7.1	9.5	16.4	18.0	11.0	2 7.11	− 0.28	−10.08	−10.08	0 1 56.75	+ 0.02
	35	γ Pegasi	Sk.	47.0	49.6	51.2	57.5	59.6	1.7	8.0	9.5	12.2	6 59.59	− 0.36	−10.08	−10.08	0 6 49.15	0.00
	36	β Ceti	Sk.	17.8	20.5	22.0	28.6	30.8	32.9	39.4	40.8	43.7	37 30.72	− 0.49	−10.14	−10.09	0 37 20.14	+ 0.10
	37	Polaris. . . .	Sk.	47.5	36.0	41.0	. .	. .	. .	. .	. .	. .	12 24.87	+14.89	. .	−10.09	1 12 29.67	− 0.65
25	38	Sun I, N. . . .	F.	48.6	51.4	53.0	59.9	2.1	4.4	11.0	12.7	15.4	15 2.06	− 0.09	. .	−10.90	6 14 51.07	. .
	39	Sun II, S. . . .	F.	6.6	9.3	10.9	17.5	20.0	22.1	28.7	30.4	33.2	17 19.86	− 0.09	. .	−10.90	6 17 8.87	. .
	40	ω Piscium . . .	F.	54.0	56.6	58.0	4.2	6.3	8.4	14.5	16.0	18.6	53 6.29	− 0.05	−11.29	−11.29	23 52 54.95	+ 0.01
	41	α Andromedæ . .	F.	54.1	57.0	58.9	5.8	8.0	10.4	17.3	19.1	22.0	2 8.07	− 0.08	−11.17	−11.30	0 1 56.66	− 0.14
	42	γ Pegasi	F.	47.9	50.6	52.2	58.4	0.5	2.6	8.9	10.5	13.2	7 0.53	− 0.05	−11.27	−11.30	0 6 49.18	− 0.03
	43	Moon II, N. . .	F.	41.0	43.6	45.2	51.4	53.6	55.7	1.9	3.4	6.0	11 53.53	− 0.05	. .	−11.30	0 11 42.18	−65.85
	44	B. A. C. 166 . .	F.	36.8	39.8	41.6	48.7	51.0	53.4	0.5	2.2	5.2	32 51.02	− 0.04	. .	−11.31	0 32 39.67	− 0.87
	45	β Ceti.	F.	18.7	21.3	23.0	29.5	31.6	33.8	40.2	41.7	44.4	37 31.58	− 0.04	−11.39	−11.31	0 37 20.23	+ 0.13
	46	B. A. C. 259 . .	F.	. .	. .	. .	. .	. .	. .	11.4	13.5	16.7	50 1.14	− 0.02	. .	−11.32	0 49 49.80	− 0.68
	47	B. A. C. 334 . .	F.	41.3	44.4	46.1	53.7	56.3	58.6	6.2	8.0	11.3	2 56.21	− 0.03	. .	−11.32	1 2 45.86	− 0.65
	48	Polaris. . . .	F.	. .	. .	44.0	10.0	37.0	4.0	29.0	. .	. .	12 36.80	+ 5.23	. .	−11.32	1 12 30.71	− 1.34
	49	θ Ceti.	F.	46.7	49.0	50.7	56.9	58.9	1.0	7.2	8.7	11.3	17 58.93	− 0.04	−11.39	−11.32	1 17 47.57	+ 0.09

4, 28, 37. Bisections at sets B and D.
21. Telescope micrometer reading decreased five revolutions in reduction.
32, 33. Bisections at set C.
43. Bisections at wires II–VI.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° '	r. ''	''	''	''							''	° ' ''	°	' ''	° ' '	''
1	312 14	10 3.9	0.0	24.5	13.0	32	280	. .	. .	. .	260	33.5	310 18 23.4	. .	− 1 6.7	1 23 37.9	− 4.1
2	0 10	7.0	3.0	28.0	14.2	34	. .	912	. .	912	. .	33.5	0 13 40.4	. .	+ 0.2	51 20 1.8	− 0.9
3	5 36	4.4	1.4	26.0	12.3	31	. .	490	. .	532	. .	33.5	5 40 34.4	. .	+ 5.6	56 47 1.2	− 0.4
4	67 44	1.8	27.0	22.1	11.0	34	790	. .	700	. .	856	33.5	67 47 47.2	65.8	+ 2 17.9	118 56 26.3	. .
5	15 6	1.6	24.8	27.2	11.6	32	. .	. .	. .	872	866	32.4	15 10 15.1	75.5	+ 15.2	66 16 51.5	− 0.9
6	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
7	352 58	3.8	27.5	24.4	16.6	35	454	432	. .	. .	. .	32.4	353 1 33.9	. .	− 6.8	44 7 48.3	+ 0.5
8	47 10	9 26.5	19.0	16.9	7.2	36	. .	. .	. .	874	878	32.4	47 13 19.9	. .	+ 59.8	98 20 40.9	− 0.1
9	15 38	10 4.5	29.9	25.1	12.4	34	610	632	. .	. .	. .	32.4	15 41 46.0	. .	+ 15.5	66 48 22.7	. .
10	15 6	5.7	29.7	25.7	11.5	32	. .	. .	. .	728	740	32.4	15 10 15.4	82.2	+ 14.9	66 16 51.5	. .
11	18 6	2.1	27.2	22.4	9.3	33	. .	810	. .	812	. .	32.4	18 10 1.3	. .	+ 18.0	69 16 40.5	. .
12	6 40	2.3	27.1	21.9	10.3	34	. .	616	. .	640	. .	32.4	6 43 48.7	. .	+ 6.5	57 50 16.4	+ 3.1
13	33 16	1.5	24.7	19.2	8.5	32	508	528	. .	538	546	32.4	33 20 22.6	. .	+ 36.1	84 27 19.9	+ 1.6
14	10 30	5.1	29.4	24.0	13.7	34	. .	466	. .	474	. .	32.4	10 33 48.5	84.4	+ 10.2	61 40 19.9	+ 3.3
15	22 34	4.3	29.4	25.0	11.0	34	. .	744	. .	790	. .	34.2	22 37 46.3	82.0	+ 22.8	73 44 30.3	+ 1.9
16	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
17	15 6	7.9	0.7	27.2	13.6	30	020	971	. .	. .	. .	34.2	15 10 56.7	. .	+ 14.8	66 17 32.7	. .
18	15 38	4.6	28.7	24.4	12.3	32	. .	. .	. .	020	116	34.2	15 42 28.0	86.0	+ 15.3	66 49 4.5	. .
19	33 16	5.8	3.4	29.4	13.5	32	. .	258	. .	308	. .	34.2	33 20 21.2	. .	+ 35.4	84 27 17.8	− 0.3
20	10 30	6.5	4.5	28.5	15.5	34	. .	500	. .	518	. .	34.2	10 33 46.5	87.8	+ 10.1	61 40 17.8	+ 1.1
21	43 40	3.2	27.9	19.8	9.4	34	. .	. .	. .	114	140	36.4	43 45 17.4	. .	+ 52.0	94 52 30.6	+ 4.0
22	307 30	2.7	7.8	25.3	16.2	36	668	684	682	678	670	36.4	307 33 15.9	84.5	− 1 10.7	358 38 26.4	+ 1.8
23	49 18	6.7	2.5	25.6	13.3	28	. .	580	. .	604	. .	36.4	49 23 20.7	. .	+ 1 3.5	100 30 45.4	+ 3.1
24	46 6	6.3	0.3	24.3	10.1	33	810	780	. .	. .	. .	36.4	46 10 2.5	. .	+ 56.7	97 17 20.4	. .
25	46 6	6.3	0.3	24.3	10.1	36	. .	. .	. .	226	242	36.4	46 9 25.8	. .	+ 56.7	97 16 43.7	. .
26	38 46	2.6	26.4	18.6	5.7	32	. .	340	. .	360	. .	36.4	38 50 29.5	. .	+ 43.9	89 57 34.6	+ 3.6
27	19 48	7.5	2.0	27.1	12.0	34	068	076	. .	082	088	36.4	19 51 56.8	82.5	+ 19.8	70 58 37.8	+ 4.5
28	51 56	10.0	3.3	28.1	14.8	31	312	. .	755	. .	921	36.9	52 0 32.3	. .	+ 1 11.3	103 8 4.8	. .
29	28 38	10.0	5.2	0.3	18.0	32	. .	215	. .	. .	. .	36.9	28 42 21.8	72.2	+ 30.6	79 49 13.6	+ 2.1
30	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
31	24 18	8.3	3.6	28.2	15.7	36	. .	700	. .	750	. .	36.9	24 21 15.0	. .	+ 25.3	75 28 1.5	+ 2.8
32	288 54	10.8	5.0	28.8	17.5	34	572	. .	. .	. .	612	36.9	288 57 45.9	72.0	− 2 40.9	340 1 26.2	+ 0.9
33	321 54	10.5	6.0	28.6	17.7	31	640	. .	. .	. .	684	36.9	321 58 30.7	. .	− 43.6	13 4 8.3	+ 1.0
34	10 26	9.4	6.5	1.4	18.2	35	. .	572	. .	588	. .	36.9	10 29 30.1	. .	+ 10.3	61 36 1.6	+ 1.6
35	24 10	9.4	6.0	2.0	16.5	34	. .	138	. .	226	. .	36.9	24 23 51.9	. .	+ 25.3	75 30 38.4	+ 1.5
36	57 28	6.2	2.5	28.8	14.5	32	. .	457	. .	540	. .	36.9	57 32 20.4	. .	+ 1 27.2	108 40 8.8	+ 2.5
37	310 12	14.7	11.5	3.4	24.3	32	258	130	. .	. .	. .	36.9	310 16 19.5	76.2	− 1 5.4	1 21 35.3	− 0.2
38	15 10	12.4	11.8	5.5	22.0	36	196	206	. .	. .	. .	35.8	15 13 15.3	93.4	+ 14.6	66 19 51.1	. .
39	15 42	6.5	3.9	29.4	13.8	38	. .	. .	. .	456	486	35.8	15 44 48.2	. .	+ 15.1	66 51 24.5	. .
40	32 38	6.3	3.4	26.5	12.5	31	. .	222	. .	258	. .	36.3	32 42 40.1	. .	+ 35.7	83 49 37.0	+ 0.6
41	10 26	7.6	7.4	0.5	18.4	35	. .	682	. .	696	. .	36.3	10 29 28.3	. .	+ 10.3	61 35 59.8	+ 0.6
42	24 20	10.6	8.2	1.5	20.3	34	. .	052	. .	082	. .	36.3	24 23 51.4	. .	+ 25.2	75 30 37.8	+ 1.3
43	39 6	6.0	2.4	26.4	14.0	36	408	624	912	104	598	36.3	39 9 12.9	76.0	+ 45.1	90 16 19.2	. .
44	8 38	15.1	13.2	6.2	24.3	29	. .	. .	. .	712	720	36.3	8 42 54.0	. .	+ 8.5	59 49 23.7	− 0.4
45	57 28	9 28.2	25.8	18.3	6.8	33	. .	. .	. .	182	188	36.3	57 32 17.8	. .	+ 1 26.8	108 40 5.8	− 0.1
46	1 0	10 6.7	5.0	27.4	12.8	32	256	250	. .	256	260	36.3	1 4 24.1	. .	+ 1.0	52 10 46.3	− 2.1
47	3 52	11.1	8.4	2.0	19.3	32	860	848	. .	862	868	36.3	3 56 10.1	. .	+ 3.8	55 2 35.1	− 0.8
48	310 12	3.2	0.6	22.5	11.3	32	728	720	730	720	732	36.3	310 16 20.2	78.4	− 1 5.1	1 21 36.3	+ 0.8
49	47 38	3.4	28.3	21.9	8.5	33	. .	478	. .	494	. .	36.3	47 42 9.8	. . .	+ 1 0.6	98 49 31.6	+ 2.8

No.	Bærom.	At. Ther.
	in.	°
4	30.13	67.5
5	30.23	72.4
10	30.21	78.5
14	30.19	82.8
15	30.03	80.0
18	30.04	84.5
20	30.03	87.8
22	30.01	84.5
27	30.02	83.5
29	30.03	72.4
32	30.05	73.0
37	30.07	75.5
38	30.07	90.0
43	30.07	77.0
48	30.08	78.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' ''	' ''	' ''	° ' ''
4	−50 40.8	− 14 58.9	. .	−1 5 39.7
9	− 2.3	− 15 45.6	. .	− 15 47.9
10	− 2.3	+ 15 45.6	. .	+ 15 43.3
11	− 4.2	+ 5.2	. .	+ 1.0
17	− 2.3	+ 15 45.9	. .	+ 15 43.6
18	− 2.3	− 15 45.9	. .	− 15 48.2
24	− 1.3	− 18.3	. .	− 19.6
25	− 1.3	+ 18.4	. .	+ 17.1
28	−44 41.6	+ 15 32.3	. .	− 29 9.3
38	− 2.3	+ 15 46.7	. .	+ 15 44.4
39	− 2.3	− 15 46.7	. .	− 15 49.0
43	−36 37.1	+ 15 54.8	. .	− 20 42.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
June 26	1	Polaris, S. P.	F.	23.1	. .	. .	. .	. .	. .	. .	. .	. .	12 46.25	− 2.39	. .	−11.63	1 12 32.23	− 0.30
	2	Jupiter, S.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	3	Jupiter, N.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	4	η Ursæ Majoris	F.	31.8	35.7	38.0	47.9	50.8	54.0	3.5	5.8	9.7	42 50.80	− 0.01	. .	−11.64	13 42 39.15	− 0.04
	5	η Bootis	F.	44.5	47.2	49.0	55.4	57.5	59.6	6.1	7.7	10.3	48 57.48	0.00	−11.60	−11.64	13 48 45.84	− 0.09
	6	B. A. C. 4681	F.	22.6	25.9	27.9	36.0	38.6	41.4	49.3	51.3	54.8	58 38.64	+ 0.20	. .	−11.65	13 58 27.19	− 1.85
	7	α Bootis	F.	58.2	0.8	2.5	9.0	11.2	13.4	19.9	21.4	24.2	10 11.18	0.00	−11.59	−11.65	14 9 59.53	− 0.06
	8	θ Bootis	F.	54.9	57.3	4.0	7.4	10.7	14.1	17.4	24.0	26.6	21 10.71	− 0.01	. .	−11.66	14 20 59.04	+ 0.03
	9	ε Bootis	F.	31.8	34.6	36.3	43.3	45.6	48.0	54.7	56.4	59.3	39 45.56	0.00	−11.67	−11.66	14 39 33.90	− 0.01
	10	α^2 Libræ	F.	59.0	1.6	3.2	9.6	11.8	13.9	20.2	21.7	24.4	44 11.71	+ 0.08	−11.78	−11.67	14 44 0.12	+ 0.10
27	11	Polaris	Sk.	52.0	59.0	50.0	14.0	43.0	. .	. .	. .	. .	12 42.09	+ 3.35	. .	−12.53	1 12 32.91	− 1.09
	12	θ^1 Ceti	Sk.	47.7	50.3	51.8	58.0	0.2	2.1	8.5	10.0	12.6	18 0.13	− 0.02	−12.55	−12.53	1 17 47.58	+ 0.04
	13	β Arietis	Sk.	44.4	47.2	48.8	55.3	57.4	59.8	6.2	7.9	10.6	47 57.51	− 0.04	−12.54	−12.54	1 47 44.93	+ 0.02
	14	Moon II, N.	Sk.	45.0	47.6	49.2	55.6	57.9	59.9	6.2	8.0	10.6	55 57.78	− 0.04	. .	−12.55	1 55 45.19	−69.54
	15	α Arietis	Sk.	7.7	10.5	12.0	18.6	21.0	23.2	29.8	31.6	34.5	0 20.99	− 0.04	−12.55	−12.56	2 0 8.39	0.00
28	16	α Aurigæ	F.	23.1	26.9	29.1	38.0	40.8	43.9	52.7	54.8	58.5	7 40.87	− 0.04	. .	−13.63	5 7 27.20	− 0.15
	17	β Orionis	F.	33.2	35.6	37.3	. .	. .	47.6	49.5	. .	. .	8 45.49	+ 0.02	−13.71	−13.63	5 8 31.88	+ 0.08
	18	ε Orionis	F.	53.6	56.2	57.8	3.8	5.9	7.9	13.9	15.4	18.3	30 5.87	0.00	−13.64	−13.64	5 29 52.23	− 0.01
29	19	Sun I, S.	F.	27.6	30.5	32.1	38.8	41.0	43.4	50.0	51.7	54.5	31 41.07	− 0.03	. .	−13.68	6 31 27.36	. .
	20	Sun II, N.	F.	. .	. .	54.3	56.5	58.7	1.0	3.0	. .	. .	33 58.70	− 0.03	. .	−13.68	6 33 44.99	. .
	21	ε Hydræ	F.	10.9	13.5	15.0	21.3	23.2	25.3	31.5	33.0	35.5	40 23.24	− 0.01	−13.65	−13.73	8 40 9.50	− 0.12
	22	α Hydræ	F.	28.2	30.8	32.3	38.5	40.5	42.6	48.9	50.4	53.0	21 40.58	+ 0.02	−13.74	−13.74	9 21 26.86	− 0.03
	23	Polaris, S. P.	F.	28.5	. .	. .	. .	. .	. .	. .	. .	. .	12 51.70	− 2.69	. .	−13.85	1 12 35.16	− 0.38
	24	ζ Virginis	F.	22.7	25.3	26.8	33.0	35.0	37.0	43.2	44.6	47.2	28 34.98	0.00	−13.86	−13.86	13 28 21.12	− 0.02
July 1	25	B. A. C. 5118	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	26	α Coronæ Borealis	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	27	α Serpentis	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	28	Groombridge 2320	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
3	29	κ Ophiuchi	F.	52.2	54.7	56.3	2.4	4.6	6.6	12.8	14.3	16.9	52 4.53	− 0.37	−16.55	−16.55	16 51 47.61	+ 0.04
	30	Anonymous	F.	. .	. .	. .	. .	. .	. .	6.6	8.4	11.4	57 57.83	− 0.57	. .	−16.55	16 57 40.71	− 2.87
	31	Anonymous	F.	55.4	58.0	0.0	. .	. .	. .	. .	. .	. .	58 8.80	− 0.57	. .	−16.55	16 57 51.74	− 2.87
	32	Anonymous	F.	. .	51.9	54.5	56.6	58.8	1.1	5.5	7.3	10.2	0 56.62	− 0.57	. .	−16.55	17 0 39.50	− 2.87
	33	Anonymous	F.	. .	. .	. .	11.4	13.2	15.5	19.9	21.6	24.7	1 11.13	− 0.57	. .	−16.55	17 0 54.01	− 2.87
	34	Anonymous	F.	10.9	13.6	15.5	22.0	24.3	26.5	33.3	34.8	37.8	5 24.30	− 0.57	. .	−16.56	17 5 7.17	− 2.89
	35	Anonymous	F.	40.0	42.8	44.5	48.7	51.2	53.2	. .	. .	. .	11 53.32	− 0.57	. .	−16.56	17 11 36.19	− 2.91
	36	Anonymous	F.	. .	54.3	56.4	58.5	0.8	3.0	7.5	9.2	11.9	11 58.60	− 0.57	. .	−16.56	17 11 41.47	− 2.91
	37	Anonymous	F.	37.6	40.4	42.0	48.8	50.9	53.1	0.0	1.6	4.3	14 50.97	− 0.57	. .	−16.56	17 14 33.84	− 2.93
	38	Anonymous	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	39	μ Herculis	F.	39.5	42.4	44.1	51.1	53.2	55.5	2.5	4.3	7.2	41 53.31	− 0.23	−16.54	−16.57	17 41 36.51	− 0.03
	40	γ^2 Sagittarii	F.	53.0	55.9	57.7	4.8	7.1	9.5	16.6	18.1	21.4	58 7.12	− 0.61	−16.54	−16.57	17 57 49.94	− 0.02
	41	μ^1 Sagittarii	F.	24.4	27.1	28.7	35.2	37.4	39.7	46.1	47.8	50.5	6 37.43	− 0.56	−16.58	−16.58	18 6 20.29	0.00
	42	δ Ursæ Minoris	F.	. .	. .	52.2	27.6	1.8	36.3	11.1	. .	. .	13 1.80	+ 7.44	. .	−16.58	18 12 52.66	− 0.29
	43	η Serpentis	F.	58.1	0.6	2.1	8.2	10.3	12.3	18.5	20.0	22.6	15 10.30	− 0.45	−16.64	−16.58	18 14 53.27	+ 0.12
7	44	α Scorpii	F.	52.8	55.5	57.3	4.0	6.3	8.6	15.5	17.2	20.0	22 6.36	− 0.28	−18.61	−18.67	16 21 47.41	− 0.07
	45	ζ Ophiuchi	F.	25.5	28.3	29.7	36.0	38.0	40.2	46.4	47.9	50.6	30 38.07	− 0.25	−18.64	−18.68	16 30 19.14	− 0.04
	46	η Herculis	F.	42.0	45.4	47.4	55.2	58.0	0.6	8.5	10.5	13.8	38 57.93	− 0.09	−18.63	−18.68	16 38 39.16	− 0.04
	47	XVI, 21	F.	46.4	49.2	50.9	57.7	59.8	2.0	8.8	10.5	13.4	40 59.86	− 0.28	. .	−18.64	16 40 40.94	− 2.80
	48	Anonymous	F.	. .	. .	53.8	56.0	58.4	0.6	2.9	. .	. .	0 58.34	− 0.28	. .	−18.66	17 0 39.40	− 2.88

11, 14. Bisections at sets B and D.
28. Bisections at set C.
35. Wire B used.
36, 48. Wire A used.
37. Telescope micrometer reading increased one revolution in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan's Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
2	46 8	10 9.0	3.3	25.8	11.7	33	. .	. .	. .	626	. .	38.1	46 12 5.3	. .	+ 56.7	97 19 23.2	. .
3	46 8	9.0	3.3	25.8	11.7	35	. .	. .	. .	. .	962	38.1	46 11 29.6	. .	+ 56.7	97 18 47.5	. .
4	348 54	8.0	3.0	25.9	12.7	35	856	864	. .	. .	. .	38.1	348 57 31.2	. .	— 10.6	40 3 41.8	+ 1.7
5	19 48	8.8	5.8	29.3	13.7	34	. .	. .	. .	214	. .	38.1	19 51 54.5	. .	+ 19.7	70 58 35.4	+ 2.4
6	79 20	1.6	25.3	14.9	3.3	33	. .	. .	. .	990	994	38.1	79 24 8.1	. .	+ 4 41.6	130 35 10.9	—22.8
7	19 0	12.8	8.8	2.7	19.5	35	. .	854	. .	872	. .	38.1	19 3 25.0	83.6	+ 18.8	70 10 5.0	+ 3.5
8	346 24	5.1	1.2	21.3	9.0	33	. .	. .	. .	826	838	38.1	346 28 6.2	. .	— 13.1	37 34 14.3	+ 2.5
9	11 14	4.8	2.1	25.8	8.7	36	. .	434	. .	434	. .	38.1	11 17 24.4	. .	+ 10.9	62 23 56.5	+ 1.9
10	54 20	10.6	5.3	28.2	13.3	34	. .	140	. .	146	. .	38.1	54 23 55.2	82.5	+ 1 16.1	105 31 32.5	+ 2.6
11	310 12	15.0	15.0	5.0	24.5	32	090	972	. .	. .	. .	37.9	310 16 21.6	. .	— 1 5.2	1 21 37.6	+ 2.0
12	47 38	12.6	8.9	1.4	19.0	32	. .	924	. .	972	. .	37.9	47 42 9.6	76.5	+ 1 0.6	98 49 31.4	+ 3.0
13	18 38	9.2	8.5	1.7	19.0	35	. .	623	. .	658	. .	37.9	18 41 29.5	. .	+ 18.6	69 48 9.3	+ 1.8
14	25 36	13.0	10.2	1.7	20.5	35	160	. .	420	. .	622	37.9	25 39 31.2	. .	+ 26.4	76 46 18.8	. .
15	15 58	11.8	9.7	2.6	20.2	37	. .	130	. .	188	. .	37.9	16 1 4.8	79.0	+ 15.8	67 7 41.8	+ 0.8
16	352 58	3.2	29.8	21.7	13.3	35	636	642	. .	. .	. .	36.6	353 1 35.9	. .	— 6.6	44 7 50.5	+ 1.9
17	47 10	9 27.2	20.1	10.4	3.5	37	. .	. .	. .	172	. .	36.6	47 13 21.6	88.5	+ 58.4	98 20 41.2	+ 1.8
18	40 6	29.1	23.4	14.1	4.9	35	. .	340	. .	350	. .	36.6	40 9 46.8	. .	+ 45.6	91 16 53.6	+ 3.7
19	15 50	8.3	6.5	28.5	16.6	31	740	766	. .	. .	. .	36.6	15 54 29.6	. .	+ 15.4	67 1 6.2	. .
20	15 18	6.1	2.4	25.4	12.1	30	. .	. .	. .	044	058	36.6	15 22 59.8	90.7	+ 14.9	66 29 35.9	. .
21	31 56	8.1	4.2	28.3	15.2	31	. .	802	. .	812	. .	36.6	32 0 29.9	. .	+ 33.0	83 7 24.7	+ 2.9
22	46 56	4.6	1.3	24.5	10.8	34	. .	. .	. .	736	736	36.6	46 59 48.9	93.2	+ 57.5	98 7 7.6	+ 2.0
23	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
24	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
25	79 30	14.3	7.5	29.4	20.4	34	353	406	. .	. .	. .	36.6	79 33 45.9	. .	+ 4 53.0	130 45 0.1	—20.7
26	11 42	13.7	8.3	2.0	18.0	36	. .	. .	. .	045	067	36.6	11 45 21.4	74.6	+ 11.6	62 51 54.2	+ 1.9
27	32 0	15.3	9.0	2.3	19.1	33	. .	400	. .	460	. .	36.6	32 4 0.2	. .	+ 35.0	83 10 56.4	+ 1.7
28	330 42	10.9	5.5	26.5	14.0	34	578	. .	. .	. .	564	36.6	330 45 47.4	. .	— 31.3	21 51 37.3	+ 0.3
29	29 14	5.1	29.0	22.6	9.9	29	. .	884	. .	896	. .	36.0	29 19 3.5	. .	+ 31.4	80 25 56.1	+ 5.6
30	62 36	0.0	20.8	15.3	4.4	33	. .	. .	. .	492	. .	36.0	62 40 15.0	. .	+ 1 47.7	113 48 23.9	—12.6
31	62 36	0.0	20.8	15.3	4.4	33	. .	. .	. .	582	. .	36.0	62 40 13.6	. .	+ 1 47.7	113 48 22.5	—12.6
32	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
33	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
34	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
35	62 14	4.5	26.7	21.2	8.4	30	936	960	. .	. .	. .	36.0	62 16 15.2	. .	+ 1 46.0	113 24 22.4	—11.7
36	62 14	4.5	26.7	21.2	8.4	36	. .	. .	. .	200	214	36.0	62 20 1.1	. .	+ 1 46.3	113 28 8.6	—11.7
37	62 14	4.5	26.7	21.2	8.4	29	. .	. .	. .	390	402	36.0	62 18 57.3	. .	+ 1 46.3	113 27 4.8	—11.5
38	61 54	8.7	1.6	26.7	13.6	33	. .	. .	. .	890	910	36.0	61 57 58.7	72.2	+ 1 44.7	113 6 4.6	—11.4
39	11 2	2.8	27.6	21.3	8.2	34	. .	596	. .	602	. .	36.0	11 5 53.2	. .	+ 11.0	62 12 25.4	+ 3.6
40	69 12	2.6	24.1	16.4	6.4	31	324	328	. .	. .	. .	36.0	69 16 45.1	. .	+ 2 27.0	120 25 33.3	+ 0.3
41	59 54	1.7	25.8	19.3	7.7	35	. .	960	. .	954	. .	36.0	59 57 33.5	. .	+ 1 36.7	111 5 31.4	+ 2.6
42	312 14	9 21.9	15.2	6.0	29.2	33	. .	596	592	594	. .	36.0	312 18 20.4	. .	— 1 1.6	3 23 40.0	+ 2.4
43	41 44	27.4	20.5	14.3	3.1	31	. .	616	. .	612	. .	36.0	41 48 44.9	71.0	+ 50.2	92 55 56.3	+ 5.1
44	64 56	10 15.0	8.4	27.4	15.6	29	. .	532	. .	554	. .	38.7	65 1 3.9	77.0	+ 1 58.8	116 9 23.9	+ 0.2
45	49 8	10.5	4.8	22.3	14.9	35	. .	690	. .	702	. .	38.7	49 11 33.3	. .	+ 1 4.4	100 18 58.9	+ 5.7
46	359 40	5.5	29.5	22.0	6.0	34	. .	104	. .	110	. .	38.7	359 44 2.8	. .	— 0.3	50 50 23.7	+ 3.1
47	63 6	9 29.8	21.7	13.8	1.7	34	. .	. .	. .	210	214	38.7	63 10 7.5	. .	+ 1 49.5	114 18 18.2	—13.8
48	62 16	10 2.5	26.6	17.6	4.8	35	194	130	. .	. .	. .	38.7	62 22 21.6	. .	+ 1 45.9	113 30 28.7	—12.5

No.	Barom.	At. Ther.
	in.	°
7	30.01	84.2
10	30.00	84.0
12	29.97	77.0
15	29.98	79.0
17	30.03	86.0
20	30.12	89.0
22	30.08	97.5
26	30.19	75.5
38	30.13	74.0
43	30.13	73.0
44	30.22	79.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
2	— 1.3	— 17.9	. .	— 19.2
3	— 1.3	+ 17.8	. .	+ 16.5
14	—25 38.1	+ 16 17.2	. .	— 9 20.9
19	— 2.4	— 15 45.1	. .	— 15 47.5
20	— 2.3	+ 15 45.1	. .	+ 15 42.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
July 7	1	Anonymous	F.	. .	8.4	10.6	12.8	15.1	17.3	21.8	23.3	26.4	1 12.86	— 0.28	. .	—18.66	17 0 53.92	— 2.88
	2	Anonymous	F.	12.7	15.3	17.2	23.9	26.2	28.4	34.9	36.6	39.5	5 26.08	— 0.28	. .	—18.66	17 5 7.14	— 2.90
	3	Anonymous	F.	. .	. .	. .	. .	. .	29.4	33.8	35.6	38.4	6 24.99	— 0.28	. .	—18.66	17 6 6.05	— 2.91
	4	Anonymous	F.	. .	. .	. .	55.7	57.7	59.9	4.0	5.8	8.6	11 55.37	— 0.28	. .	—18.66	17 11 36.43	— 2.93
	5	Anonymous	F.	. .	. .	. .	. .	. .	. .	9.5	11.0	14.0	12 0.57	— 0.28	. .	—18.66	17 11 41.63	— 2.93
	6	Anonymous	F.	. .	. .	48.1	50.4	52.7	55.0	57.2	. .	. .	14 52.68	— 0.28	. .	—18.66	17 14 33.74	— 2.94
	7	Anonymous	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	8	B. A. C. 5962	F.	58.5	1.5	3.3	10.4	12.8	15.2	22.2	24.0	27.0	32 12.77	— 0.14	. .	—18.67	17 31 53.96	— 2.55
	9	B. A. C. 5988	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	10	μ Herculis	F.	41.6	44.5	46.2	53.1	55.4	57.8	4.6	6.3	9.2	41 55.41	— 0.15	—18.71	—18.71	17.41 36.55	0.00
	11	γ^2 Sagittarii	F.	54.8	57.7	59.5	6.7	8.9	11.4	18.5	20.3	23.2	58 9.00	— 0.28	—18.72	—18.71	17 57 50.01	+ 0.02
	12	μ^1 Sagittarii	F.	26.2	29.1	30.7	37.1	39.3	41.6	48.1	49.7	52.5	6 39.37	— 0.27	—18.78	—18.72	18 6 20.38	+ 0.06
	13	δ Ursæ Minoris.	F.	. .	. .	57.5	32.0	6.5	41.0	16.0	. .	. .	13 6.60	+ 0.27	. .	—18.72	18 12 52.15	— 0.21
	14	η Serpentis	F.	. .	. .	10.3	12.3	14.3	16.3	20.5	22.0	24.5	15 12.27	— 0.24	—18.79	—18.72	18 14 53.31	+ 0.13
	15	α Lyræ	F.	48.1	51.4	53.4	1.2	3.8	6.3	14.0	16.0	19.5	33 3.74	— 0.09	—18.67	—18.73	18 32 44.92	— 0.04
	16	51 Cephei, S. P.	F.	. .	. .	52.0	10.5	13.0	14.0	2.0	. .	. .	41 27.28	— 6.12	. .	—18.73	6 41 2.43	+ 0.08
	17	ι Aurigæ	E.	56.3	59.2	1.0	8.4	10.8	13.2	20.7	22.5	25.5	49 10.84	— 0.14	—19.13	—19.08	4 48 51.62	+ 0.01
	18	α Aurigæ.	E.	29.2	32.9	35.1	44.0	47.0	49.9	58.4	0.6	4.3	7 46.82	— 0.01	. .	—19.09	5 7 27.72	+ 0.11
	19	β Orionis.	E.	39.0	41.6	43.3	49.4	51.4	53.5	59.9	1.3	3.8	8 51.47	— 0.35	—19.14	—19.09	5 8 32.03	+ 0.05
	20	β Tauri	E.	29.0	32.0	38.5	40.7	43.0	45.2	47.7	54.0	56.9	18 43.00	— 0.17	—19.12	—19.10	5 18 23.73	0.00
	21	δ Orionis.	E.	44.6	47.0	52.8	54.9	56.8	58.9	1.0	6.5	9.3	25 56.87	— 0.32	—19.13	—19.10	5 25 37.45	0.00
	22	ε Orionis.	E.	59.5	2.1	3.7	9.8	11.9	14.0	20.0	21.6	24.2	30 11.87	— 0.32	—19.16	—19.10	5 29 52.45	+ 0.05
	23	B. A. C. 1794	E.	. .	. .	. .	. .	. .	. .	. .	56.3	59.0	34 46.66	— 0.33	. .	—19.14	5 34 27.19	— 0.12
	24	Venus II, N.	E.	. .	. .	. .	. .	25.0	27.2	31.6	33.3	36.0	40 22.74	— 0.21	. .	—19.14	5 40 3.39	— 0.39
	25	Venus, S.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	26	α Orionis.	E.	31.6	34.0	35.7	41.8	43.9	46.0	52.0	53.6	56.3	48 43.88	— 0.29	—19.14	—19.11	5 48 24.48	0.00
8	27	Sun I, N.	E.	41.4	44.0	45.9	52.4	54.6	56.8	3.6	5.3	7.7	8 54.63	— 0.21	. .	—19.17	7 8 35.25	. .
	28	Sun II, S.	E.	. .	. .	. .	. .	. .	. .	20.3	22.0	25.0	11 11.55	— 0.21	. .	—19.17	7 10 52.17	. .
	29	α Hydræ	E.	36.6	38.2	42.3	44.3	46.4	48.4	50.5	54.5	56.2	21 46.38	— 0.35	—19.19	—19.20	9 21 26.83	— 0.04
	30	Moon I, N.	E.	3.8	6.4	8.0	14.3	16.3	18.4	24.6	26.1	28.7	57 16.29	— 0.34	. .	—19.29	11 56 56.66	+62.96
	31	B. A. C. 4124	E.	30.5	33.2	34.8	41.2	43.4	45.5	52.0	53.6	56.3	9 43.39	— 0.40	. .	—19.29	12 9 23.70	— 0.93
	32	η Virginis	E.	39.0	41.8	43.3	49.4	51.5	53.5	59.6	1.0	3.8	13 51.43	— 0.34	—19.29	—19.28	12 13 31.81	— 0.01
	33	B. A. C. 4211	E.	. .	. .	. .	. .	. .	. .	. .	54.5	57.1	23 44.39	— 0.39	. .	—19.28	12 23 24.72	— 1.04
	34	β Corvi	E.	56.8	59.6	1.3	7.8	10.0	12.4	19.0	20.8	23.5	28 10.13	— 0.41	—19.33	—19.28	12 27 50.44	+ 0.01
	35	12 Canum Venat.	E.	16.0	19.3	21.2	29.0	31.7	34.4	42.4	44.2	47.5	50 31.74	— 0.14	—19.26	—19.29	12 50 12.31	— 0.03
	36	B. A. C. 4367	E.	5.8	8.5	9.9	16.1	18.3	20.4	26.6	28.0	30.8	56 18.27	— 0.30	. .	—19.28	12 55 58.69	— 1.46
	37	θ Virginis	E.	37.5	40.0	41.6	47.8	49.9	51.9	58.0	59.5	2.0	3 49.80	— 0.36	—19.30	—19.29	13 3 30.15	— 0.03
	38	Polaris, S. P.	E.	. .	. .	12.0	45.5	19.0	53.0	26.0	. .	. .	13 19.10	—16.27	. .	—19.30	1 12 43.53	— 0.18
	39	α Virginis	E.	. .	. .	. .	57.8	59.8	1.9	6.0	7.5	10.0	18 57.68	— 0.38	—19.26	—19.30	13 18 38.00	— 0.06
	40	Jupiter I, S.	E.	37.5	40.1	41.7	. .	. .	. .	58.1	59.5	2.2	24 49.85	— 0.37	. .	—19.28	13 24 30.20	. .
	41	Jupiter II, N.	E.	. .	. .	48.3	50.4	52.5	54.5	56.6	. .	. .	24 52.46	— 0.37	. .	—19.28	13 24 32.81	. .
	42	5 Ursæ Minoris.	E.	30.3	36.6	53.7	2.0	11.0	19.6	28.1	45.6	51.9	28 10.98	+ 1.03	. .	—19.33	14 27 52.68	+ 0.03
	43	β Ursæ Minoris.	E.	41.5	50.9	56.9	20.2	28.0	35.5	58.5	4.2	14.2	51 27.77	+ 0.86	. .	—19.34	14 51 9.29	+ 0.12
	44	B. A. C. 4954	E.	18.0	21.4	23.5	31.5	34.2	37.0	45.0	46.9	50.4	57 34.21	— 0.46	. .	—19.28	14 57 14.47	— 2.30
	45	B. A. C. 5017	E.	56.9	0.4	2.3	10.5	13.2	16.0	24.0	26.0	29.5	8 13.20	— 0.46	. .	—19.28	15 7 53.46	— 2.41
	46	B. A. C. 5046	E.	16.6	20.0	21.8	30.0	32.6	35.3	43.4	45.3	48.6	13 32.62	— 0.46	. .	—19.28	15 13 12.88	— 2.45
	47	B. A. C. 5065	E.	45.1	47.2	52.3	55.0	57.7	0.4	2.9	8.1	10.1	16 57.64	— 0.46	. .	—19.28	15 16 37.90	— 2.46
	48	γ^2 Ursæ Minoris.	E.	38.8	47.1	52.0	12.0	18.5	25.2	45.8	50.4	58.8	21 18.73	+ 0.69	. .	—19.35	15 21 0.07	— 0.05
	49	α Coronæ Borealis	E.	31.7	34.6	36.2	43.2	45.5	47.7	54.6	56.3	59.4	29 45.47	— 0.22	—19.23	—19.36	15 29 25.89	— 0.13
	50	α Serpentis	E.	16.2	18.9	20.3	26.5	28.5	30.6	36.8	38.4	41.0	38 28.58	— 0.32	—19.29	—19.36	15 38 8.90	— 0.05

1, 4. Wire B used.
5. Wire A used.
16. R. A. wires V and VI evidently wrong; reduced for 28.0, 44.0.
30. Bisections at wires V–VII.
42. Bisections at wires B_1 and D_3.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	62 16	10 2.5	26.6	17.6	4.8	33	406	326	. .	. .	. .	38.7	62 17 43.2	. .	+ 1 45.6	113 25 50.0	−12.5
2	62 16	2.5	26.6	17.6	4.8	31	. .	840	. .	870	. .	38.7	62 20 39.7	. .	+ 1 45.8	113 28 46.7	−12.2
3	62 8	8.0	0.2	23.7	11.4	29	. .	. .	. .	856	870	38.7	62 13 5.0	. .	+ 1 45.2	113 21 11.4	−12.2
4	62 14	14.5	7.9	1.3	17.9	30	. .	. .	. .	720	716	38.7	62 16 12.1	. .	+ 1 45.4	113 24 18.7	−11.8
5	62 14	14.5	7.9	1.3	17.9	36	. .	. .	. .	. .	036	38.7	62 19 56.3	. .	+ 1 45.7	113 28 3.2	−11.8
6	62 14	14.5	7.9	1.3	17.9	29	. .	. .	. .	898	910	38.7	62 18 57.3	. .	+ 1 45.6	113 27 4.1	−11.6
7	61 54	7.2	28.6	21.2	8.3	33	. .	. .	. .	326	334	38.7	61 58 14.0	. .	+ 1 44.2	113 6 19.4	−11.5
8	7 58	6.0	1.6	23.2	9.0	34	. .	894	. .	916	. .	38.7	8 1 48.8	. .	+ 7.9	59 8 17.9	− 3.9
9	14 14	7.3	3.7	24.5	9.8	30	. .	424	. .	444	. .	38.7	14 18 55.8	. .	+ 14.2	65 25 31.2	− 4.5
10	11 2	1.6	27.6	23.5	5.6	34	. .	. .	. .	770	786	38.7	11 5 54.0	. .	+ 10.9	62 12 26.1	+ 5.5
11	69 12	9.5	24.7	15.8	3.9	31	494	484	. .	480	486	38.7	69 16 44.6	. .	+ 2 26.2	120 25 32.0	− 1.2
12	59 54	13.6	7.0	1.0	18.8	35	. .	432	. .	430	. .	38.7	59 57 32.8	. .	+ 1 36.1	111 5 30.1	+ 1.3
13	312 14	3.0	22.0	16.8	6.3	33	200	200	200	200	200	38.7	312 18 20.2	. .	− 1 1.2	3 23 40.2	+ 3.7
14	41 44	27.1	19.2	20.8	1.8	31	. .	808	. .	814	. .	38.7	41 48 43.7	75.5	+ 49.9	92 55 54.8	+ 4.0
15	0 10	1.6	2.2	18.4	3.9	35	888	892	. .	. .	. .	38.7	0 13 37.0	. .	+ 0.2	51 19 58.4	+ 1.2
16	306 6	1.2	25.5	14.0	5.4	37	950	950	942	940	960	38.7	306 9 7.8	. .	− 1 16.3	357 14 12.7	+ 2.9
17	5 52	9.4	7.3	0.5	17.8	35	. .	560	. .	690	. .	35.6	5 55 28.4	. .	+ 5.8	57 1 55.4	+ 0.3
18	352 58	6.7	6.6	28.3	17.8	35	550	505	. .	. .	. .	35.6	353 1 31.3	79.5	− 6.8	44 7 45.7	− 3.7
19	47 10	16.0	12.3	5.5	24.4	35	. .	. .	. .	978	022	35.6	47 13 16.9	. .	+ 1 0.0	98 20 38.1	+ 0.4
20	10 20	15.1	12.2	6.3	24.2	35	. .	640	. .	680	. .	35.6	10 23 22.1	. .	+ 10.2	61 29 53.5	0.0
21	39 12	11.7	7.0	1.5	19.7	32	. .	340	. .	350	. .	35.6	39 16 17.2	. .	+ 45.3	90 23 23.7	− 0.9
22	40 6	9.4	4.5	29.5	15.2	34	. .	810	. .	840	. .	35.6	40 9 42.0	. .	+ 46.8	91 16 50.0	+ 1.5
23	40 50	17.3	11.7	5.0	24.0	35	. .	. .	. .	660	640	35.6	40 53 22.4	. .	+ 48.0	92 0 31.6	+11.9
24	15 58	9.5	5.8	29.0	18.1	32	. .	. .	. .	410	450	35.6	16 2 18.4	. .	+ 15.9	67 8 55.5	. .
25	15 58	9.5	5.8	29.0	18.1	31	. .	. .	. .	705	685	35.6	16 2 29.7	. .	+ 15.9	67 9 6.8	. .
26	31 26	9.8	5.2	0.6	18.4	33	. .	. .	. .	540	550	35.6	31 30 0.7	. .	+ 33.9	82 36 55.8	+ 1.1
27	16 4	13.0	6.0	28.7	16.8	32	470	470	. .	. .	. .	35.6	16 8 16.6	84.0	+ 15.9	67 14 53.7	. .
28	16 36	9.7	6.3	28.2	13.8	34	. .	. .	. .	320	340	35.6	16 39 50.2	. .	+ 16.5	67 46 27.9	. .
29	46 56	10.2	4.9	28.0	14.7	34	. .	520	. .	560	. .	35.6	46 59 46.6	. .	+ 58.8	98 7 6.6	+ 2.0
30	37 38	9.9	4.3	26.7	14.7	36	. .	. .	840	730	595	37.1	37 41 13.0	87.0	+ 42.2	88 48 16.4	. .
31	55 40	12.7	7.3	1.7	17.7	35	. .	810	. .	860	. .	37.1	55 43 25.2	. .	+ 1 20.1	106 51 6.5	−13.1
32	38 48	9.7	4.1	28.7	12.6	36	. .	120	. .	180	. .	37.1	38 51 24.1	. .	+ 44.1	89 58 29.4	+ 3.6
33	54 38	11.6	6.6	0.1	15.3	34	. .	. .	. .	470	530	37.1	54 41 47.4	. .	+ 1 17.2	105 49 25.8	−13.3
34	61 30	14.1	9.2	1.0	20.5	31	. .	305	. .	315	. .	37.1	61 34 33.2	. .	+ 1 40.9	112 42 35.3	+ 2.4
35	359 50	11.7	8.7	1.3	19.5	33	. .	585	. .	600	. .	37.1	359 53 59.5	. .	− 0.1	51 0 20.6	+ 2.7
36	27 12	11.7	7.3	29.4	17.3	35	. .	965	. .	965	. .	37.1	27 15 24.4	. .	+ 28.3	78 22 13.9	− 4.6
37	43 40	14.9	10.8	3.5	22.1	28	. .	395	. .	435	. .	37.1	43 45 15.9	. .	+ 52.6	94 52 29.7	+ 3.8
38	307 30	12.3	9.8	2.3	21.4	36	325	. .	365	. .	355	37.1	307 33 15.6	. .	− 1 11.6	358 38 25.2	+ 0.2
39	49 18	11.1	6.8	0.5	16.6	28	. .	. .	. .	500	520	37.1	49 23 18.8	. .	+ 1 4.1	100 30 44.1	+ 2.5
40	46 22	12.8	7.8	1.7	17.7	33	380	. .	. .	. .	375	37.1	46 26 2 7	. .	+ 57.8	97 33 21.7	. .
41	46 22	12.8	7.8	1.7	17.7	35	. .	640	. .	650	. .	37.1	46 25 28.1	. .	+ 57.8	97 32 47.1	. .
42	322 36	12.0	8.1	3.4	20.2	36	800	. .	. .	. .	830	37.1	322 39 9.6	. .	− 42.2	13 44 48.6	− 0.6
43	324 10	14.8	12.5	3.0	22.7	32	. .	375	. .	335	. .	37.1	324 14 16.4	. .	− 39.9	15 19 57.7	+ 0.5
44	79 20	15.2	9.1	0.7	19.9	33	. .	740	. .	810	. .	37.1	79 23 55.2	. .	+ 4 46.4	130 35 2.8	−22.3
45	79 46	12.6	7.0	27.1	17.4	31	. .	375	. .	430	. .	37.1	79 50 34.3	. .	+ 4 58.5	131 1 54.0	−22.1
46	78 56	13.5	7.8	28.8	19.1	29	. .	530	. .	540	. .	37.1	79 1 1.6	. .	+ 4 37.1	130 11 59.9	−21.7
47	78 0	13.3	8.3	29.7	18.8	27	. .	. .	. .	580	530	37.1	78 5 31.9	. .	+ 3 56.8	129 15 49.9	−21.3
48	326 34	14.0	11.1	2.2	21.5	35	. .	455	. .	465	. .	37.1	326 37 29.8	. .	− 36.6	17 43 14.4	+ 2.7
49	11 42	14.3	9.8	4.0	19.5	36	. .	050	. .	065	. .	37.1	11 45 20.1	. .	+ 11.6	62 51 52.9	+ 2.7
50	32 0	15.8	11.3	2.3	21.8	33	. .	290	. .	300	. .	37.1	32 4 1.3	. .	+ 34.8	83 10 57.3	+ 3.4

No.	Barom.	At. Ther.
	in.	°
14	30.23	78.0
18	30.32	79.0
27	30.32	82.5
30	30.27	84.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
24	− 1.5	+ 5.7	. .	+ 4.2
25	− 1.5	− 5.7	+ 0.1	− 7.1
27	− 2.4	+ 15 47.1	. .	+ 15 44.7
28	− 2.4	− 15 47.1	. .	− 15 49.5
30	−33 58.7	+ 15 15.4	. .	− 18 43.3
40	− 1.2	− 17.3	. .	− 18.5
41	− 1.2	+ 17.3	. .	+ 16.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. July 8	1	ε Serpentis . . .	E.	44.7	47.4	48.9	55.6	57.1	59.2	5.4	6.8	9.4	44 57.10	− 0.32	−19.32	−19.36	15 44 37.42	− 0.04
	2	ζ Ursæ Minoris . .	E.	. .	. .	36.6	46.6	56.7	6.7	17.0	. .	. .	48 56.72	+ 1.30	. .	−19.37	15 48 38.65	− 0.12
13	3	α Serpentis . . .	F.	19.6	22.0	23.6	29.7	31.8	33.9	40.0	41.6	44.0	38 31.80	− 0.28	−22.59	−22.57	15 38 8.95	+ 0.04
	4	ε Serpentis . . .	F.	48.0	50.6	52.0	58.2	0.2	2.3	8.5	10.0	12.6	45 0.27	− 0.29	−22.55	−22.57	15 44 37.41	− 0.02
	5	Moon I, N.. . .	F.	56.9	59.9	1.6	8.5	10.8	13.0	20.0	21.7	24.6	50 10.78	− 0.40	. .	−22.57	15 49 47.81	+67.07
	6	B. A. C. 5355¹ . .	F.	45.7	48.8	50.6	. .	. .	. .	10.0	11.7	14.8	2 0.27	− 0.43	. .	−22.58	16 1 37.26	− 2.68
	7	B. A. C. 5355² . .	F.	. .	. .	56.0	58.4	0.8	2.5	5.8	. .	. .	2 0.70	− 0.43	. .	−22.58	16 1 37.89	− 2.68
	8	τ Herculis . . .	F.	6.2	9.9	12.0	21.0	24.0	27.0	36.0	38.0	42.0	16 24.01	+ 0.01	. .	−22.58	16 16 1.44	+ 0.04
	9	α Scorpii	F.	56.9	59.7	1.3	8.1	10.4	12.7	19.6	21.2	24.1	22 10.44	− 0.41	−22.58	−22.58	16 21 47.45	− 0.01
	10	ζ Ophiuchi . . .	F.	29.7	32.3	33.9	40.0	42.1	44.2	50.5	51.9	54.5	30 42.12	− 0.36	−22.60	−22.59	16 30 19.17	+ 0.01
	11	B. A. C. 5587 . .	F.	14.7	17.5	19.0	25.4	27.5	29.6	35.7	37.3	40.0	35 27.41	− 0.26	. .	−22.59	16 35 4.56	− 2.42
	12	B. A. C. 5620 . .	F.	55.5	58.2	59.7	6.0	8.3	10.3	16.6	18.2	20.9	40 8.19	− 0.24	. .	−22.59	16 39 45.36	− 2.43
14	13	β¹ Scorpii	E.	23.3	26.0	27.6	34.0	36.1	38.4	44.9	46.5	49.3	58 36.23	− 0.45	−23.07	−23.06	15 58 12.72	+ 0.04
	14	Groombridge 2320	E.	52.0	59.0	3.0	19.7	25.0	30.6	46.8	50.9	57.5	6 24.94	+ 0.56	. .	−23.06	16 6 2.44	+ 0.19
	15	δ Ophiuchi . . .	E.	1.4	3.9	5.4	11.6	13.6	15.7	21.8	23.4	25.8	8 13.62	− 0.38	−23.08	−23.06	16 7 50.18	+ 0.04
	16	τ Herculis . . .	E.	6.9	10.6	12.8	21.6	24.6	27.5	36.4	38.5	42.4	16 24.59	− 0.01	. .	−23.06	16 16 1.52	+ 0.13
	17	XVI, 16 . . .	E.	36.5	39.4	41.0	47.7	50.0	52.4	59.1	0.9	3.7	35 50.08	− 0.48	. .	−23.07	16 35 26.53	− 2.79
	18	XVI, 15 . . .	E.	. .	. .	32.2	34.4	36.5	38.7	41.0	. .	. .	36 36.56	− 0.40	. .	−23.07	16 36 13.03	− 2.73
	19	Moon I, N.. . .	E.	1.3	4.4	6.0	13.0	15.5	17.9	24.8	26.6	29.7	43 15.47	− 0.48	. .	−23.07	16 42 51.92	+68.92
	20	κ Ophiuchi . . .	E.	58.6	1.3	2.7	8.9	11.0	13.2	19.4	20.8	23.5	52 11.04	− 0.31	−23.14	−23.08	16 51 47.65	+ 0.10
	21	d Herculis . . .	E.	13.0	15.3	20.3	22.7	25.3	27.7	30.2	35.1	37.0	57 25.24	− 0.15	. .	−23.08	16 57 2.01	+ 0.21
	22	ε Ursæ Minoris . .	E.	. .	47.4	2.0	17.4	32.7	47.5	17.9	29.0	48.0	59 17.35	+ 2.58	. .	−23.08	16 58 56.85	− 0.18
	23	α¹ Herculis . . .	E.	10.1	12.6	14.3	20.6	22.7	24.9	31.2	32.7	35.4	9 22.72	− 0.29	−23.02	−23.08	17 8 59.35	− 0.04
	24	XVII, 2 . . .	E.	44.2	46.7	48.5	55.0	57.4	59.5	6.0	7.6	10.5	13 57.27	− 0.45	. .	−23.07	17 13 33.75	− 2.89
	25	Mars I, N. . . .	E.	33.3	36.4	38.0	. .	. .	. .	56.3	58.0	0.9	24 47.15	− 0.48	. .	−23.07	17 24 23.60	+ 0.88
	26	Mars II, S.. . .	E.	. .	. .	44.2	46.6	48.8	51.2	53.4	. .	. .	24 48.84	− 0.48	. .	−23.07	17 24 25.29	− 0.81
	27	α Ophiuchi . . .	E.	21.3	23.0	25.5	31.8	33.9	35.9	42.3	43.8	46.5	29 33.88	− 0.30	−23.06	−23.09	17 29 10.49	0.00
16	28	XVII, 7 . . .	F.	46.4	49.5	51.3	58.8	1.2	3.5	11.0	12.8	15.8	24 1.14	− 0.56	. .	−24.36	17 23 36.22	− 3.24
	29	XVII, 10 . . .	F.	1.4	4.5	6.2	13.4	15.7	18.1	25.3	27.0	30.0	30 15.73	− 0.55	. .	−24.36	17 29 50.82	− 3.20
	30	B. A. C. 5975 . .	F.	. .	42.2	45.5	48.6	51.7	54.8	1.0	3.2	7.1	33 48.56	+ 0.02	. .	−24.36	17 33 24.22	− 2.62
	31	XVII, 15 . . .	F.	19.7	22.7	24.6	31.8	34.2	36.7	44.0	45.7	48.8	40 34.24	− 0.56	. .	−24.37	17 40 9.31	− 3.30
	32	XVIII, 2 . . .	F.	59.3	2.3	4.0	11.2	13.5	16.0	23.2	25.0	27.9	5 13.60	− 0.55	. .	−24.38	18 4 48.67	− 3.36
	33	δ Ursæ Minoris . .	F.	. .	. .	58.9	32.8	8.4	. .	16.6	. .	. .	13 7.86	+ 7.11	. .	−24.38	18 12 50.59	− 0.22
	34	η Serpentis . . .	F.	6.0	8.5	10.0	16.0	18.1	20.1	26.3	27.7	30.4	15 18.12	− 0.41	−24.41	−24.38	18 14 53.33	+ 0.09
	35	I Aquilæ	F.	39.8	42.2	43.7	49.9	52.0	54.1	0.3	1.8	4.3	28 52.01	− 0.44	−24.36	−24.38	18 28 27.19	+ 0.05
	36	α Lyræ	F.	53.9	57.2	59.0	6.9	9.5	12.2	19.9	21.9	25.1	33 9.51	− 0.12	−24.41	−24.39	18 32 45.00	+ 0.04
	37	Moon I, S.. . .	F.	0.0	2.9	4.7	11.9	14.3	16.8	24.0	25.8	28.7	36 14.34	− 0.54	. .	−24.39	18 35 49.41	+70.79
	38	β Lyræ	F.	40.4	43.4	45.2	52.7	55.0	57.5	4.8	6.6	9.7	45 55.03	− 0.17	−24.36	−24.39	18 45 30.47	0.00
	39	ζ Aquilæ	F.	54.7	57.5	58.9	5.1	7.3	9.4	15.7	17.3	19.9	0 7.31	− 0.32	−24.43	−24.40	18 59 42.59	+ 0.11
19	40	Sun I, S. . . .	F.	26.7	29.3	30.9	. .	. .	. .	48.5	50.4	53.0	53 39.80	− 0.28	. .	−26.32	7 53 13.20	. .
	41	Sun II, N. . . .	F.	42.2	44.8	46.4	53.0	55.1	57.3	4.0	5.6	8.5	55 55.21	− 0.28	. .	−26.32	7 55 28.61	. .
	42	α Leonis	F.	57.5	0.1	1.7	8.1	10.0	12.0	18.5	19.9	22.7	2 10.06	− 0.30	−26.36	−26.37	10 1 43.39	− 0.05
	43	γ¹ Leonis	F.	18.9	21.8	23.4	30.0	32.2	34.2	40.8	42.3	45.0	13 32.07	− 0.28	−26.38	−26.37	10 13 5.42	− 0.01
21	44	Moon II, N. . .	Sk.	30.6	33.0	34.9	41.0	43.2	45.4	51.7	53.3	55.9	7 43.22	− 0.46	. .	−27.15	23 7 15.61	−65.49
	45	B. A. C. 8201 . .	Sk.	31.0	34.5	36.3	44.0	46.8	49.5	57.3	59.1	2.7	26 46.80	− 0.78	. .	−27.16	23 26 18.86	− 3.08
	46	B. A. C. 8309 . .	Sk.	19.6	23.0	25.1	33.2	36.0	38.6	46.7	48.7	52.2	48 35.90	− 0.80	. .	−27.17	23 48 7.93	− 2.97
	47	B. A. C. 8332 . .	Sk.	18.6	21.5	23.3	30.3	32.7	35.0	12.3	14.0	17.0	53 32.74	− 0.70	. .	−27.17	23 53 4.87	− 2.65
	48	α Andromedæ . .	Sk.	14.0	15.8	20.4	22.7	25.0	27.3	29.7	34.4	36.0	2 25.03	− 0.27	−27.08	−27.17	0 1 57.59	− 0 07
	49	4 Draconis, S. P. .	Sk.	. .	39.4	31.5	1.7	51.1	41.4	11.4	3.6	. .	6 51.44	− 3.09	. .	−27.17	12 6 21.18	+ 0.46
	50	Polaris	Sk.	26.0	14.0	16.0	. .	. .	. .	. .	. .	. .	13 2.40	+20.74	. .	−27.19	1 12 55.95	− 0.06

2, 22, 49. Bisections at wires C_1 and C_5.
5, 25, 26. Telescope micrometer reading decreased five revolutions in reduction.
5, 50. Transits and bisections at sets B and D.
14. Bisections at wires II and III.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan's Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	33 58	10 13.5	9.5	0.6	20.1	34	. .	020	. .	040	. .	37.1	34 1 51.9	78.0	+ 37.6	85 8 50.7	+ 2.5
2	320 40	14.6	11.3	3.3	22.8	34	515	. .	. .	. .	520	37.1	320 43 39.9	. .	− 45.5	11 49 15.6	− 0.4
3	32 0	9 22.8	16.5	9.0	29.5	34	. .	672	. .	674	. .	33.3	32 3 59.8	. .	+ 34.2	83 10 55.2	+ 1.8
4	33 58	25.8	20.8	13.2	3.1	34	. .	918	. .	930	. .	33.3	34 1 52.1	. .	+ 36.8	85 8 50.1	+ 2.4
5	63 20	26.6	20.6	13.3	2.8	34	204	. .	028	. .	004	33.3	63 25 21.5	. .	+ 1 48.6	114 33 31.3	. .
6	71 6	28.9	22.5	14.8	4.3	33	526	. .	. .	. .	596	33.3	71 10 10.6	79.9	+ 2 38.7	122 19 10.5	−17.8
7	71 6	28.9	22.5	14.8	4.3	33	. .	548	. .	598	. .	33.3	71 10 10.9	. .	+ 2 38.7	122 19 10.8	−17.8
8	352 14	25.1	20.4	14.1	1.8	38	. .	160	. .	160	. .	33.3	352 17 3.3	. .	− 7.4	43 23 17.1	+ 0.9
9	64 56	29.8	23.8	16.9	4.8	29	. .	796	. .	798	. .	33.3	65 1 7.3	. .	+ 1 57.0	116 9 25.5	+ 1.7
10	49 8	23.1	17.2	7.7	28.6	36	530	564	. .	. .	. .	33.3	49 11 30.9	. .	+ 1 3.5	100 18 55.6	+ 2.6
11	26 10	10 10.1	5.1	28.3	17.4	29	. .	. .	. .	796	796	33.3	26 14 56.6	. .	+ 27.1	77 21 44.9	− 5.6
12	22 50	9 26.2	20.7	13.6	0.8	31	618	632	. .	. .	. .	33.3	22 54 42.8	77.4	+ 23.2	74 1 27.2	− 4.9
13	58 16	10 5.0	28.3	21.3	9.3	33	. .	500	. .	530	. .	34.2	58 20 6.7	77.0	+ 1 28.9	109 27 56.8	+ 1.3
14	330 42	4.5	0.0	22.0	7.8	34	930	870	. .	. .	. .	34.2	330 45 45.8	. .	− 30.8	21 51 36.2	+ 1.9
15	42 10	8.3	2.1	28.3	11.3	28	. .	. .	. .	800	. .	34.2	42 15 15.2	. .	+ 50.0	93 22 26.4	+ 2.9
16	352 14	3.8	29.6	24.8	8.5	37	. .	. .	. .	730	620	34.2	352 17 3.4	. .	− 7.5	43 23 17.1	+ 1.2
17	65 0	6.1	28.9	23.0	8.3	30	. .	020	. .	960	. .	34.2	65 4 59.6	. .	+ 1 57.9	116 13 18.7	−14.6
18	61 16	6.3	29.3	24.4	10.5	25	. .	. .	. .	730	710	34.2	61 22 4.7	. .	+ 1 40.5	112 30 6.4	−13.7
19	66 6	3.0	27.2	21.3	8.0	33	410	400	260	220	115	34.2	66 10 11.3	. .	+ 2 4.0	117 18 36.5	. .
20	29 14	5.8	0.7	26.3	9.5	29	. .	950	. .	990	. .	34.2	29 18 59.1	. .	+ 31.0	80 25 51.3	+ 2.3
21	5 4	4.8	0.8	23.2	9.8	31	. .	615	. .	605	. .	34.2	5 8 35.1	. .	+ 5.0	56 15 1.3	+ 2.9
22	316 36	6.9	3.0	24.0	13.3	33	190	. .	. .	. .	210	34.2	316 40 8.4	. .	− 52.0	7 45 37.6	+ 1.7
23	24 18	6.9	1.6	24.0	9.0	36	. .	690	. .	650	. .	34.2	24 21 16.7	. .	+ 25.0	75 28 2.9	+ 3.0
24	59 46	6.0	0.6	25.3	11.5	30	. .	355	. .	400	. .	34.2	59 50 52.4	. .	+ 1 34.6	110 58 48.2	− 11.3
25	66 44	6.0	0.2	23.8	9.6	35	420	. .	. .	. .	480	34.2	66 48 52.0	. .	+ 2 7.9	117 57 21.1	. .
26	66 44	6.0	0.2	23.8	9.6	33	. .	925	. .	939	. .	34.2	66 49 15.5	. .	+ 2 8.0	117 57 44.7	. .
27	26 10	10.8	6.5	29.0	16.7	32	. .	. .	. .	950	010	34.2	26 14 8.2	75.0	+ 27.2	77 20 56.6	+ 2.4
28	72 22	1.0	24.4	17.5	4.3	29	. .	. .	. .	340	356	34.5	72 27 15.1	. .	+ 2 50.9	123 36 27.2	−13.1
29	69 36	9 27.4	20.2	13.4	0.5	29	756	788	. .	. .	. .	34.5	69 41 11.9	. .	+ 2 26.9	120 50 0.0	−12.1
30	350 10	23.5	20.6	10.5	29.8	33	. .	. .	. .	578	588	34.5	350 14 16.9	. .	− 9.4	41 20 28.7	− 0.1
31	71 24	28.2	23.0	15.0	2.4	32	. .	542	. .	550	. .	34.5	71 28 28.1	79.2	+ 2 41.5	122 37 30.8	−11.6
32	69 46	10 0.3	23.0	17.8	2.7	35	. .	004	. .	024	. .	34.5	69 49 49.0	. .	+ 2 27.7	120 58 37.9	− 9.3
33	312 14	9 27.8	24.0	14.4	3.8	33	. .	504	500	500	. .	34.5	312 18 13.3	. .	− 1 0.1	3 23 34.4	+ 0.7
34	41 44	27.0	20.5	16.5	0.7	31	. .	670	. .	686	. .	34.5	41 48 42.5	. .	+ 49.0	92 55 52.7	+ 2.8
35	47 8	27.5	21.5	13.5	0.4	32	. .	404	. .	410	. .	34.5	47 12 31.8	. .	+ 59.1	98 19 52.1	+ 1.9
36	0 10	22.6	18.5	9.5	27.5	36	. .	442	. .	446	. .	34.5	0 13 34.0	. .	+ 0.2	51 19 55.4	+ 0.7
37	68 6	10 4.4	28.2	21.5	8.2	38	. .	202	162	172	. .	34.5	68 8 56.0	. .	+ 2 15.6	119 17 32.8	. .
38	5 36	1.2	27.4	19.4	4.5	32	. .	354	. .	360	. .	34.5	5 40 27.9	. .	+ 5.4	56 46 54.5	+ 0.7
39	25 8	9 28.0	23.9	16.5	1.8	32	310	318	. .	. .	. .	34.5	25 12 31.2	78.5	+ 25.8	76 19 18.2	+ 2.4
40	18 14	10 11.7	10.3	4.0	19.7	34	554	554	. .	. .	. .	32.6	18 17 39.0	. .	+ 18.5	69 24 18.7	. .
41	17 42	5.8	3.8	28.5	11.7	33	. .	. .	. .	212	212	32.6	17 46 6.2	74.8	+ 17.9	68 52 45.3	. .
42	26 14	9 28.2	26.2	13.5	5.5	32	. .	. .	. .	018	030	32.6	26 18 33.6	. .	+ 27.5	77 25 22.3	+ 3.4
43	18 20	26.5	26.3	15.1	4.8	30	. .	. .	. .	512	518	32.6	18 24 57.0	76.8	+ 18.5	69 31 36.7	+ 3.6
44	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . . .	. .	. .	. . . .	. .
45	77 16	10 6.2	29.5	19.7	9.2	34	. .	. .	. .	610	690	33.5	77 19 48.5	. .	+ 4 3.4	128 30 13.1	+22.0
46	79 44	6.5	29.4	19.7	8.4	33	. .	564	. .	750	. .	33.5	79 48 3.7	69.2	+ 5 0.6	130 59 25.5	+24.1
47	69 58	6.0	28.0	19.9	7.9	34	. .	. .	. .	978	984	33.5	69 1 44.2	. .	+ 2 24.7	120 10 30.1	+22.1
48	10 26	5.1	1.4	25.3	10.0	36	. .	. .	. .	230	240	33.5	10 29 23.2	. .	+ 10.4	61 35 54.8	+ 1.6
49	297 10	7.4	1.4	25.4	13.0	32	660	. .	. .	. .	692	33.5	297 14 15.7	. .	− 1 48.6	348 18 48.3	+ 2.7
50	310 12	10.5	5.7	28.0	16.5	32	440	200	. .	. .	. .	33.5	310 16 20.0	. .	− 1 6.1	1 21 35.1	+ 1.6

No.	Barom.	At. Ther.
	in.	°
1	30.28	79.0
6	29.88	80.8
12	29.86	78.8
13	29.88	78.0
27	29.87	77.0
31	29.86	80.0
39	29.88	79.5
41	30.24	74.5
43	30.20	75.6
46	29.98	71.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
5	−48 18.3	+ 14 47.2	. .	− 33 31.1
19	−49 32.9	+ 14 49.6	. .	− 34 43.3
25	− 17.9	+ 11.8	. .	− 6.1
26	− 17.9	− 11.8	. .	− 29.7
37	−50 52.2	− 14 59.9	. .	−1 5 52.1
40	− 2.7	− 15 46.7	. .	− 15 49.4
41	− 2.7	+ 15 46.7	. .	+ 15 44.0

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
July 21	1	θ^1 Ceti	Sk.	4.0	6.3	8.0	14.2	16.2	18.3	24.4	26.0	28.5	18 16.21	− 0.56	−27.31	−27.19	1 17 48.46	+ 0.14
	2	β Arietis	Sk.	0.3	2.9	4.5	11.1	13.3	15.4	22.0	23.6	26.3	48 13.27	− 0.35	−27.17	−27.20	1 47 45.72	− 0.01
23	3	Moon II, N.	F.	21.4	24.1	25.7	31.9	34.0	36.1	42.4	43.9	46.5	46 34.00	− 0.31	. .	−28.51	0 46 5.18	−65.25
	4	ε Piscium	F.	45.8	48.4	49.9	56.0	58.2	0.2	6.4	7.9	10.5	56 58.14	− 0.29	−28.54	−28.51	0 56 29.34	+ 0.05
	5	Polaris	F.	. .	. .	13.5	39.0	4.0	31.0	58.0	. .	. .	13 5.10	+20.94	. .	−28.52	1 12 57.52	− 0.25
	6	θ^1 Ceti	F.	5.0	7.6	9.2	15.3	17.4	19.4	25.6	27.0	29.8	18 17.37	− 0.40	−28.57	−28.52	1 17 48.45	+ 0.07
	7	η Piscium	F.	5.6	8.3	9.8	16.1	18.3	20.4	26.7	28.2	30.8	25 18.24	− 0.24	−28.52	−28.52	1 24 49.48	+ 0.07
	8	o Piscium	F.	5.7	8.3	9.9	16.1	18.2	20.2	26.4	27.9	30.6	39 18.14	− 0.28	−28.52	−28.53	1 38 49.33	− 0.04
	9	B. A. C. 569	F.	13.7	16.6	18.4	25.4	27.8	30.2	37.0	38.8	41.7	46 27.73	− 0.11	. .	−28.53	1 45 59.09	− 1.52
	10	β Arietis	F.	1.4	4.2	5.9	12.3	14.5	16.7	23.2	24.8	27.6	48 14.51	− 0.20	−28.50	−28.53	1 47 45.78	− 0.01
	11	B. A. C. 625	F.	53.0	55.7	57.0	3.3	5.4	7.4	13.5	15.0	17.5	56 5.31	− 0.33	. .	−28.53	1 55 36.45	− 1.57
	12	α Arietis	F.	24.7	27.4	29.0	35.8	38.0	40.2	46.8	48.4	51.3	0 37.96	− 0.17	−28.50	−28.54	2 0 9.25	− 0.03
25	13	Polaris	Sk.	28.0	23.5	19.5	. .	. .	. .	. .	. .	. .	13 4.23	+24.77	. .	−29.23	1 12 59.77	+ 0.07
	14	θ^1 Ceti	Sk.	5.9	8.5	10.0	16.2	18.3	20.3	26.5	28.0	30.6	18 18.26	− 0.57	−29.23	−29.23	1 17 48.46	+ 0.02
	15	β Arietis	Sk.	2.4	5.0	6.7	13.2	15.4	17.6	24.2	25.8	28.5	48 15.42	− 0.31	. .	−29.24	1 47 45.87	+ 0.02
	16	α Arietis	Sk.	25.6	28.4	30.0	36.6	38.8	41.0	47.8	49.5	52.2	0 38.88	− 0.28	−29.24	−29.24	2 0 9.36	+ 0.01
	17	Moon II, N.	Sk.	43.0	45.7	47.3	53.8	56.0	58.2	4.9	6.5	9.2	32 56.07	− 0.34	. .	−29.25	2 32 26.48	−70.59
	18	β Tauri	E.	40.0	43.0	44.7	51.6	54.0	56.4	3.3	5.0	8.0	18 54.00	− 0.18	−29.61	−29.57	5 18 24.25	+ 0.02
	19	δ Orionis	E.	55.6	58.0	59.6	5.8	7.8	9.8	16.0	17.6	20.0	26 7.80	− 0.42	−29.55	−29.57	5 25 37.81	− 0.05
	20	ε Orionis	E.	10.6	13.1	14.7	20.8	22.8	24.8	30.9	32.6	35.0	30 22.81	− 0.43	−29.58	−29.58	5 29 52.80	− 0.01
	21	α Orionis	E.	42.3	45.0	46.6	52.8	54.8	56.8	3.0	4.6	7.2	48 54.79	− 0.37	−29.58	−29.58	5 48 24.84	− 0.03
	22	μ Geminorum	E.	41.0	43.8	45.5	52.0	54.3	56.5	3.1	4.8	7.7	15 54.30	− 0.24	−29.55	−29.59	6 15 24.47	− 0.08
	23	γ Geminorum	E.	47.0	49.7	51.4	57.7	59.9	2.1	8.4	9.9	12.6	30 59.86	− 0.30	−29.58	−29.60	6 30 29.96	− 0.05
	24	α Canis Majoris	E.	55.7	58.3	0.0	6.3	8.4	10.7	17.0	18.5	21.3	40 8.47	− 0.53	−29.69	−29.60	6 39 38.34	+ 0.01
	25	ε Canis Majoris	E.	58.7	1.6	3.4	10.4	12.7	15.0	21.9	23.8	26.7	54 12.69	− 0.60	−29.55	−29.61	6 53 42.48	− 0.11
	26	Mercury II, N.	E.	39.5	42.0	43.8	50.2	52.5	54.7	1.3	2.8	5.7	58 52.50	− 0.26	. .	−29.62	6 58 22.62	− 0.28
	27	Mercury, S.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	28	δ Canis Majoris	E.	34.9	37.7	39.4	46.3	48.5	50.7	57.7	59.3	2.2	3 48.52	− 0.59	−29.62	−29.61	7 3 18.32	− 0.04
	29	Venus II, S.	E.	43.2	44.9	49.4	51.6	53.8	56.0	58.2	2.7	4.4	15 53.80	− 0.24	. .	−29.63	7 15 23.93	− 0.38
	30	Venus, N.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
29	31	γ^2 Sagittarii	Sk.	7.6	10.5	12.4	19.5	21.7	24.2	31.3	33.2	36.0	58 21.82	− 0.91	−30.87	−31.06	17 57 49.85	− 0.18
	32	XVIII, 2	Sk.	. .	15.8	18.3	20.6	23.0	25.3	30.3	33.2	35.0	5 20.67	− 0.92	. .	−31.19	18 4 48.56	− 3.36
	33	δ Ursæ Minoris	Sk.	23.5	48.5	59.0	33.0	8.0	. .	. .	. .	. .	13 7.62	+11.06	. .	−31.07	18 12 47.61	− 0.05
	34	XVIII, 16	Sk.	20.0	23.0	24.8	31.9	34.4	36.8	43.7	45.6	48.5	33 34.30	− 0.91	. .	−31.18	18 33 2.21	− 3.48
	35	XVIII, 19	Sk.	0.4	3.0	4.6	11.3	13.3	15.5	22.0	23.6	26.4	39 13.34	− 0.79	. .	−31.18	18 38 41.37	− 3.20
	36	β Lyræ	Sk.	47.2	50.3	52.0	59.5	1.9	4.3	11.7	13.3	16.5	46 1.86	− 0.20	−31.19	−31.09	18 45 30.57	+ 0.13
	37	B. A. C. 6489	Sk.	0.6	3.7	5.6	12.4	14.8	17.2	24.3	26.0	29.0	55 14.84	− 0.91	. .	−31.18	18 54 42.75	− 3.55
	38	ζ Aquilæ	Sk.	1.7	4.2	5.9	12.2	14.2	16.3	22.6	24.2	26.8	0 14.23	− 0.46	−31.17	−31.10	18 59 42.67	+ 0.15
	39	XIX, 3	Sk.	56.1	59.0	0.7	7.8	10.1	12.4	19.5	21.2	24.1	12 10.10	− 0.90	. .	−31.18	19 11 38.02	− 3.57
	40	B. A. C. 6659	Sk.	21.8	25.7	28.0	37.6	40.8	44.0	53.6	55.9	59.9	20 40.81	+ 0.15	. .	−31.18	19 20 9.78	− 2.60
	41	Anonymous	Sk.	34.0	37.1	39.0	46.3	48.6	51.1	58.7	0.4	3.4	32 48.73	− 0.94	. .	−31.18	19 32 16.61	− 3.75
	42	XIX, 13	Sk.	56.0	59.0	1.0	6.3	8.9	11.5	. .	. .	. .	44 11.52	− 1.02	. .	−31.17	19 43 39.33	− 4.03
	43	XIX, 14	Sk.	10.6	13.4	15.0	21.7	24.0	26.2	32.9	34.6	37.4	47 23.98	− 0.84	. .	−31.17	19 46 51.97	− 3.48
	44	λ Ursæ Minoris	Sk	. .	. .	. .	. .	. .	. .	54.0	21.0	. .	49 38.70	+36.70	. .	−31.12	19 49 44.28	+ 2.75
	45	α Cygni	Sk.	26.8	30.4	32.5	41.0	43.9	46.8	55.6	57.6	1.3	37 43.99	+ 0.02	−31.17	−31.15	20 37 12.86	+ 0.04
	46	12 Year Cat. 1879	Sk.	32.0	47.3	56.3	31.8	44.0	56.0	31.0	39.6	54.4	53 43.60	+ 3.27	. .	−31.16	20 53 15.71	+ 0.19
	47	σ^2 Ursæ Majoris, S. P.	Sk.	. .	. .	7.0	1.5	56.2	50.9	45.3	. .	. .	59 56.18	− 2.46	. .	−31.16	8 59 22.56	+ 0.07
	48	ζ Cygni	Sk.	57.0	0.0	1.7	8.6	11.0	13.4	20.4	22.0	25.0	8 11.01	− 0.26	−31.16	−31.17	21 7 39.58	0.00

13. Transits and bisections at set B. B_2 reduced for $13^s.5$.
17, 47. Bisections at sets B and D.
43. Microscope readings probably reversed.
46. Bisections at set C.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan's Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ″	″
1	47 38	10 0.4	26.4	16.9	5.6	33	. .	798	. .	892	. .	33.5	47 42 4.7	. .	+ 1 1.6	98 49 27.5	+ 3.8
2	18 38	4.8	2.5	26.2	12.6	35	. .	910	. .	934	. .	33.5	18 41 26.4	68.3	+ 19.0	69 48 6.6	+ 3.4
3	34 10	0.5	23.5	14.5	4.2	42	. .	888	250	754	. .	33.6	34 11 41.8	. .	+ 38.0	85 18 41.0	. .
4	31 36	0.2	24.8	15.8	5.2	34	. .	630	. .	636	. .	33.6	31 39 53.7	. .	+ 34.5	82 46 49.4	+ 3.7
5	310 12	6.9	27.2	16.0	7.1	32	850	846	834	824	830	33.6	310 16 18.5	71.2	− 1 5.9	1 21 33.8	+ 0.5
6	47 38	0.0	23.5	12.4	4.1	34	. .	020	. .	026	. .	33.6	47 42 4.4	. .	+ 1 1.4	98 49 27.0	+ 3.8
7	24 8	0.5	24.8	14.4	5.2	38	. .	050	. .	058	. .	33.6	24 11 1.6	. .	+ 25.1	75 17 47.9	+ 3.5
8	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
9	9 50	0.8	26.6	19.6	5.2	29	254	258	. .	. .	. .	33.6	9 55 14.4	. .	+ 9.8	61 1 45.4	+ 7.1
10	18 38	0.0	26.2	19.1	5.5	36	. .	. .	. .	476	476	33.6	18 41 24.7	. .	+ 18.9	69 48 4.8	+ 1.9
11	36 38	0.3	24.7	19.5	4.5	29	. .	684	. .	690	. .	33.6	36 43 8.6	. .	+ 41.7	87 50 11.5	+16.6
12	15 58	16.6	12.2	4.3	24.4	36	. .	. .	. .	842	846	33.6	16 1 2.4	71.4	+ 16.1	67 7 39.7	+ 3.0
13	310 12	8.6	4.8	26.7	14.2	32	550	420	. .	. .	. .	33.6	310 16 19.2	71.0	− 1 6.2	1 21 34.2	+ 1.2
14	47 38	6.5	1.0	24.0	9.9	33	. .	520	. .	660	. .	33.6	47 42 3.2	. .	+ 1 1.6	98 49 26.0	+ 3.1
15	18 38	5.5	2.8	26.3	11.5	35	. .	942	. .	030	. .	33.6	18 41 25.5	. .	+ 19.0	69 48 5.7	+ 3.2
16	15 58	6.0	2.7	26.5	11.6	37	. .	549	. .	588	. .	33.6	16 1 1.1	. .	+ 16.1	67 7 38.4	+ 2.0
17	21 20	7.3	4.1	28.3	13.2	35	578	. .	792	. .	958	33.6	21 23 26.9	73.0	+ 21.9	72 30 10.0	. .
18	10 20	11.7	8.0	1.0	20.8	35	. .	740	. .	750	. .	33.6	10 23 21.6	. .	+ 10.1	61 29 52.9	− 0.3
19	39 12	3.5	28.0	18.7	8.1	32	. .	815	. .	840	. .	32.3	39 16 16.8	82.8	+ 44.9	90 23 22.9	+ 1.0
20	40 6	0.0	25.5	19.5	5.4	35	. .	405	. .	495	. .	32.3	40 9 38.7	. .	+ 46.3	91 16 46.2	+ 0.4
21	31 26	0.8	26.5	18.8	6.6	34	. .	080	. .	130	. .	32.3	31 29 58.7	. .	+ 33.6	82 36 53.5	+ 0.7
22	16 14	0.2	27.3	17.6	6.7	31	. .	265	. .	275	. .	32.3	16 18 42.5	. .	+ 16.0	67 25 19.7	+ 1.1
23	22 18	1.5	23.6	19.2	7.0	30	440	450	. .	475	485	32.3	22 22 55.0	. .	+ 22.5	73 29 38.7	+ 3.0
24	55 20	4.1	24.8	18.9	8.2	30	. .	120	. .	240	. .	32.3	55 24 57.9	. .	+ 1 18.9	106 32 38.0	+ 2.9
25	67 36	0.0	25.4	16.0	5.7	36	. .	330	. .	370	. .	32.3	67 39 25.6	. .	+ 2 11.4	118 47 58.2	− 0.6
26	18 20	2.5	29.5	19.0	8.3	35	510	. .	. .	. .	610	32.3	18 23 35.1	. .	+ 18.1	69 30 14.4	. .
27	18 20	2.5	29.5	19.0	8.3	35	. .	015	. .	045	. .	32.3	18 23 43.0	. .	+ 18.1	69 30 22.3	. .
28	65 0	0.3	24.8	19.3	6.1	36	. .	830	. .	855	. .	32.3	65 3 17.2	. .	+ 1 56.2	116 11 34.6	+ 2.2
29	16 16	9 27.5	25.0	15.2	3.8	35	650	. .	. .	. .	770	32.3	16 19 37.2	. .	+ 15.9	67 26 14.3	. .
30	16 16	27.5	25.0	15.2	3.8	36	. .	410	. .	465	. .	32.3	16 19 25.9	89.0	+ 15.9	67 26 3.0	. .
31	69 12	10.8	5.5	28.5	16.0	30	. .	408	. .	412	. .	34.4	69 16 47.7	. .	+ 2 25.2	120 25 34.1	− 0.1
32	69 46	8.4	29.0	23.5	9.5	34	. .	700	. .	690	. .	34.4	69 49 47.2	. .	+ 2 29.5	120 58 37.9	−10.0
33	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
34	69 26	6.0	0.9	22.5	11.0	34	. .	832	. .	884	. .	34.4	69 29 44.7	74.2	+ 2 27.1	120 38 33.0	− 7.4
35	58 32	6.7	1.4	24.4	12.0	32	. .	378	. .	396	. .	34.4	58 36 21.6	. .	+ 1 30.6	109 44 13.4	− 5.1
36	5 36	7.5	5.0	25.8	12.5	32	. .	. .	. .	081	. .	34.4	5 40 25.3	. .	+ 5.5	56 46 52.0	+ 1.4
37	68 50	6.4	29.6	22.6	8.6	30	. .	892	. .	930	. .	34.4	68 54 45.9	. .	+ 2 22.9	120 3 30.0	− 5.3
38	25 8	4.0	29.4	22.6	8.5	32	. .	099	. .	107	. .	34.4	25 12 28.6	. .	+ 26.1	76 19 15.9	+ 2.5
39	68 2	10.0	4.1	27.0	14.4	32	. .	772	. .	880	. .	34.4	68 6 11.8	. .	+ 2 17.3	119 14 50.3	− 3.6
40	348 48	6.1	2.0	25.0	10.5	33	. .	110	. .	160	. .	34.4	348 52 10.8	. .	− 10.9	39 58 21.1	+ 2.2
41	71 34	6.5	1.0	21.5	10.0	39	. .	518	. .	550	. .	34.4	71 36 33.4	. .	+ 2 45.5	122 45 40.1	− 1.9
42	77 28	7.5	29.8	20.8	11.5	31	. .	368	. .	. .	. .	34.4	77 32 38.0	. .	+ 4 6.0	128 43 5.2	− 1.3
43	63 4	8.4	20.5	28.7	7.5	38	. .	558	. .	628	. .	34.4	63 6 48.8	. .	+ 1 49.2	114 14 59.2	+ 0.3
44	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
45	354 0	8.7	5.0	27.0	13.8	35	. .	000	. .	068	. .	34.4	354 3 39.0	. .	− 5.8	45 9 54.4	+ 0.7
46	318 46	4.0	28.0	20.2	8.0	35	648	. .	. .	. .	644	34.4	318 49 35.4	. .	− 48.8	9 55 7.8	+ 2.0
47	286 32	10.5	5.0	26.3	16.5	36	630	662	. .	. .	. .	34.4	286 35 12.8	. .	− 3 5.0	337 38 29.0	+ 3.9
48	9 6	6.0	2.8	26.3	11.2	31	. .	535	. .	620	. .	34.4	9 10 33.8	70.8	+ 9.0	60 17 4.0	+ 2.7

No.	Barom.	At. Ther.
	in.	°
2	30.00	70.0
5	30.04	74.0
12	30.06	74.0
13	30.15	73.3
17	30.17	73.4
19	30.19	80.5
30	30.18	86.0
31	30.12	72.5
34	29.97	75.5
48	29.99	72.3

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
3	−32 37.7	+ 15 56.6	. .	− 16 41.1
17	−21 25.2	+ 16 11.1	. .	− 5 14.1
26	− 3.2	+ 4.0	. .	+ 0.8
27	− 3.2	− 4.0	+ 0.1	− 7.1
29	− 1.5	− 5.7	. .	− 7.2
30	− 1.5	+ 5.7	− 0.1	+ 4.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
July 30	1	δ Scorpii	E.	18.5	21.3	22.9	29.6	31.8	33.9	40.5	42.2	45.0	53 31.74	− 0.57	−32.16	−32.14	15 52 59.03	+ 0.03
	2	β¹ Scorpii	E.	32.3	34.8	36.6	43.2	45.3	47.5	53.9	55.6	58.4	58 45.29	− 0.55	−32.15	−32.14	15 58 12.60	+ 0.04
	3	δ Ophiuchi . . .	E.	10.3	12.8	14.4	20.5	22.5	24.6	31.0	32.5	35.0	8 22.62	− 0.45	−32.14	−32.15	16 7 50.02	+ 0.01
	4	B. A. C. 5437 . .	E.	5.1	7.7	9.1	15.3	17.4	19.7	25.7	27.1	29.8	12 17.43	− 0.46	. .	−32.15	16 11 44.82	− 2.29
	5	B. A. C. 5466 . .	E.	46.0	48.6	50.3	56.8	59.0	1.1	7.6	9.3	12.0	16 58.97	− 0.28	. .	−32.16	16 16 26.53	− 2.19
	6	B. A. C. 5525 . .	E.	12.2	15.0	16.6	23.2	25.4	27.6	34.1	35.8	38.6	25 25.39	− 0.26	. .	−32.16	16 24 52.97	− 2.21
	7	B. A. C. 5596 . .	E.	37.0	40.9	43.3	52.6	55.9	58.9	8.1	10.5	14.5	35 55.74	+ 0.09	. .	−32.16	16 35 23.67	− 2.24
	8	η Herculis . . .	E.	55.5	58.8	0.6	8.5	11.1	13.8	21.7	23.6	27.0	39 11.18	− 0.07	−32.20	−32.16	16 38 38.95	+ 0.05
	9	B. A. C. 5628 . .	E.	. .	. .	. .	. .	42.4	47.0	56.7	0.4	6.6	40 37.51	+ 0.59	. .	−32.16	16 40 5.94	− 2.42
	10	B. A. C. 5731 . .	E.	50.7	53.7	55.5	2.7	5.1	7.5	14.6	16.5	19.5	56 5.09	− 0.17	. .	−32.17	16 55 32.75	− 2.30
	11	ε Ursæ Minoris. .	E.	11.0	23.4	53.5	8.3	23.4	39.0	53.6	24.2	35.3	59 23.52	+ 3.32	. .	−32.18	16 58 54.66	− 0.21
	12	Mars I, S. . . .	E.	15.4	18.3	20.0	. .	. .	. .	38.5	40.2	43.1	22 29.25	− 0.61	. .	−32.18	17 21 56.46	+ 0.80
	13	Mars II, N. . .	E.	. .	. .	26.1	28.4	30.6	33.0	35.5	. .	. .	22 30.72	− 0.61	. .	−32.18	17 21 57.93	− 0.67
	14	B. A. C. 5950 . .	E.	55.9	0.4	3.0	. .	. .	. .	31.7	34.2	38.9	30 17.35	+ 0.24	. .	−32.18	17 29 45.41	− 2.44
	15	B. A. C. 5951 . .	E.	. .	. .	15.5	19.0	22.6	26.0	29.9	. .	. .	30 22.60	+ 0.24	. .	−32.18	17 29 50.66	− 2.44
	16	B. A. C. 5990 . .	E.	. .	. .	24.9	27.8	30.8	33.8	36.8	. .	. .	36 30.82	+ 0.04	. .	−32.18	17 35 58.68	− 2.41
	17	μ Herculis . . .	E.	55.0	57.8	59.6	6.5	8.8	11.0	18.0	19.7	22.6	42 8.78	− 0.21	−32.13	−32.20	17 41 36.37	− 0.07
	18	B. A. C. 6052 . .	E.	20.3	24.4	26.9	36.6	39.9	43.2	52.7	55.1	59.2	46 39.81	+ 0.13	. .	−32.19	17 46 7.75	− 2.45
	19	B. A. C. 6082 . .	E.	17.3	20.5	22.5	30.2	32.9	35.3	42.9	44.8	48.6	52 32.71	− 0.10	. .	−32.19	17 52 0.42	− 2.44
	20	B. A. C. 6162 . .	E.	0.7	4.0	6.2	14.8	17.6	20.4	28.7	30.9	34.5	4 17.53	− 0.01	. .	−32.19	18 3 45.33	− 2.47
	21	δ Ursæ Minoris . .	E.	. .	28.0	53.0	. .	12.0	. .	. .	. .	. .	13 11.71	+ 8.42	. .	−32.23	18 12 47.90	+ 0.60
	22	η Serpentis . . .	E.	13.8	16.3	17.9	24.0	26.0	28.0	34.3	35.7	38.1	15 26.01	− 0.45	−32.27	−32.23	18 14 53.33	+ 0.10
	23	α Lyræ	E.	1.5	4.8	6.7	14.5	17.1	19.9	27.8	29.6	32.8	33 17.19	− 0.08	−32.18	−32.24	18 32 44.87	− 0.04
	24	51 Cephei, S. P. .	E.	. .	. .	. .	35.0	52.5	. .	4.0	32.5	38.5	41 52.86	−11.58	. .	−32.25	6 41 9.03	+ 1.06
Aug. 4	25	μ Geminorum . .	E.	. .	. .	. .	. .	3.4	5.7	10.0	11.6	14.6	16 1.19	− 0.37	−36.05	−36.13	6 15 24.29	− 0.12
	26	γ Geminorum . .	E.	54.0	56.7	58.3	4.6	6.8	9.0	15.4	16.8	19.6	31 6.80	− 0.43	−36.15	−36.14	6 30 30.23	− 0.02
	27	α Canis Majoris . .	E.	2.6	5.4	7.0	13.4	15.5	17.6	24.0	25.7	28.3	40 15.50	− 0.69	−36.35	−36.15	6 39 38.66	+ 0.12
	28	ε Canis Majoris. .	E.	5.6	8.6	10.4	17.4	19.7	22.0	29.0	30.8	33.5	54 19.67	− 0.78	−36.17	−36.16	6 53 42.73	− 0.04
	29	δ Geminorum . .	E.	. .	12.3	14.5	16.7	18.8	21.0	25.5	27.0	29.8	13 16.63	− 0.37	−36.13	−36.17	7 12 40.09	− 0.10
	30	α² Geminorum . .	E.	0.1	3.0	5.0	12.1	14.5	17.0	24.2	26.0	29.0	27 14.54	− 0.26	−36.22	−36.18	7 26 38.10	+ 0.28
	31	α Canis Minoris. .	E.	10.3	13.0	14.5	20.6	22.6	24.6	30.8	32.3	34.9	33 22.62	− 0.52	−36.20	−36.18	7 32 45.92	− 0.14
	32	β Geminorum . .	E.	3.0	6.0	8.0	14.9	17.3	19.5	26.4	28.1	30.9	38 17.12	− 0.31	−36.19	−36.19	7 37 40.62	− 0.03
	33	Mercury II, S. .	E.	27.7	30.5	32.3	38.7	40.9	43.0	49.7	51.4	54.0	54 40.91	− 0.38	. .	−36.25	7 54 4.28	− 0.23
	34	Venus II, S. . .	E.	8.0	10.9	12.6	19.0	21.4	23.6	30.0	31.7	34.5	8 21.30	− 0.38	. .	−36.26	8 7 44.66	− 0.37
	35	Venus, N. . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
5	36	Sun I, S. . . .	E.	26.0	28.6	30.3	36.6	38.8	41.0	47.4	49.0	51.5	0 38.80	− 0.42	. .	−36.30	9 0 2.08	. .
	37	Sun II, N. . . .	E.	38.6	41.0	42.8	49.0	51.3	53.5	0.0	1.6	4.3	2 51.34	− 0.42	. .	−36.30	9 2 14.68	. .
	38	α Ursæ Majoris. .	E.	10.0	15.9	19.0	32.3	36.6	41.0	54.2	57.7	3.3	56 36.67	+ 0.45	. .	−36.30	10 56 0.82	+ 0.17
	39	δ Leonis	E.	52.2	54.6	56.4	3.1	5.1	7.4	13.9	15.5	18.2	8 5.16	− 0.38	−36.42	−36.31	11 7 28.47	− 0.05
	40	β Leonis	E.	5.9	8.6	10.4	16.6	18.7	20.8	27.2	28.7	31.4	43 18.70	− 0.44	−36.41	−36.33	11 42 41.93	+ 0.06
	41	γ Ursæ Majoris. .	E.	31.0	35.5	38.1	48.7	52.0	55.9	6.3	8.6	13.2	47 52.14	+ 0.10	. .	−36.33	11 47 15.97	+ 0.08
	42	Moon I, N. . .	E.	. .	. .	. .	. .	53.0	55.2	59.4	0.9	3.5	22 50.91	− 0.58	. .	−36.45	12 22 13.88	+62.97
	43	κ Ophiuchi . . .	E.	12.0	14.5	16.0	22.4	24.5	26.5	32.7	34.3	36.8	52 24.41	− 0.46	−36.53	−36.51	16 51 47.44	+ 0.06
	44	d Herculis . . .	P.	23.6	26.6	28.5	35.9	38.4	40.8	48.0	49.9	53.0	57 38.30	− 0.20	. .	−36.51	16 57 1.59	+ 0.06
	45	a¹ Herculis . . .	E.	23.5	26.0	27.7	34.0	36.1	38.2	44.6	46.1	48.9	9 36.12	− 0.42	−36.45	−36.52	17 8 59.18	− 0.05
	46	XVII, 2	E.	57.8	0.5	2.0	8.6	10.8	13.0	19.6	21.3	24.0	14 10.84	− 0.71	. .	−36.51	17 13 33.62	− 2.79
	47	B. A. C. 5871 . .	E.	10.4	14.0	16.4	25.2	28.0	31.0	39.8	42.0	46.0	17 28.09	+ 0.01	. .	−36.51	17 16 51.59	− 2.24
	48	XVII, 8	E.	14.2	16.9	18.6	25.3	27.6	29.9	36.5	38.2	41.0	24 27.58	− 0.73	. .	−36.52	17 23 50.33	− 2.91
	49	Mars I, S. . . .	E.	29.6	32.5	34.2	. .	. .	. .	52.7	54.5	57.4	25 43.48	− 0.77	. .	−36.52	17 25 6.19	+ 0.76
	50	Mars II, N. . .	E.	. .	. .	40.3	42.6	44.8	47.1	49.6	. .	. .	25 44.88	− 0.77	. .	−36.52	17 25 7.59	− 0.64

11, 24. Bisections at sets B and D.
12, 13. Telescope micrometer reading decreased five revolutions in reduction.
49. Telescope micrometer reading increased one revolution in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	61 4	9 28.5	27.6	20.7	7.2	33	. .	610	. .	620	. .	34.0	61 8 7.4	77.0	+ 1 40.0	112 16 8.6	+ 4.4
2	58 16	10 0.6	25.3	17.7	5.7	33	. .	760	. .	780	. .	34.0	58 20 6.3	. .	+ 1 29.4	109 27 56.9	+ 1.6
3	42 10	0.3	29.4	22.8	9.0	29	. .	045	. .	075	. .	34.0	42 15 15.4	. .	+ 50.2	93 22 26.8	+ 4.2
4	43 12	0.0	28.3	23.3	7.3	33	. .	550	. .	540	. .	34.0	43 16 7.4	. .	+ 52.1	94 23 20.7	— 9.2
5	19 22	6.3	2.2	25.0	12.2	31	. .	780	. .	820	. .	34.0	19 26 30.1	. .	+ 19.5	70 33 10.8	— 2.2
6	17 4	1.0	26.0	18.5	4.5	35	. .	690	. .	690	. .	34.0	17 7 36.9	. .	+ 17.1	68 14 15.2	— 1.5
7	349 40	7.0	3.6	24.8	11.5	36	. .	480	. .	490	. .	34.0	349 43 18.3	. .	— 10.0	40 49 29.5	+ 3.6
8	359 40	2.2	28.7	22.7	7.3	34	. .	135	. .	175	. .	34.0	359 43 57.8	. .	0.3	50 50 18.7	+ 2.2
9	334 0	10.0	6.5	26.7	15.7	31	. .	. .	. .	730	760	34.0	334 4 28.9	. .	— 27.0	25 10 23.1	+ 4.9
10	7 42	2.6	29.5	21.5	7.3	30	. .	730	. .	800	. .	34.0	7 46 49.7	. .	+ 7.6	58 53 18.5	+ 0.8
11	316 36	0.0	26.3	16.7	7.2	33	740	. .	. .	. .	765	34.0	316 40 7.0	. .	— 52.3	7 45 35.9	+ 3.1
12	66 38	9 29.0	23.3	15.7	3.6	34	520	. .	. .	. .	600	34.0	66 43 12.4	. .	+ 2 8.1	117 51 45.7	. .
13	66 38	29.0	23.3	15.7	3.6	35	. .	900	. .	930	. .	34.0	66 42 51.8	. .	+ 2 8.1	117 51 21.1	. .
14	343 34	10 7.2	3.2	25.2	14.3	35	. .	. .	. .	425	465	34.0	343 37 34.2	. .	— 16.3	34 43 39.1	+ 3.7
15	343 34	7.2	3.2	25.2	14.3	32	. .	. .	. .	100	125	34.0	343 38 25.2	. .	— 16.3	34 44 30.1	+ 3.7
16	352 46	12.2	8.0	0.3	17.7	36	. .	. .	. .	200	200	34.0	352 49 17.8	. .	— 7.0	43 55 32.0	+ 2.9
17	11 2	4.4	0.5	23.0	8.8	34	. .	765	. .	820	. .	34.0	11 5 46.5	. .	+ 10.9	62 12 18.6	+ 2.4
18	348 2	4.5	29.8	21.4	10.2	37	. .	420	. .	430	. .	34.0	348 5 6.6	. .	— 11.7	39 11 16.1	+ 3.2
19	1 34	3.3	0.3	21.7	7.9	35	. .	870	. .	890	. .	34.0	1 37 30.8	. .	+ 1.6	52 43 53.6	+ 2.0
20	355 22	9 28.9	24.6	16.0	3.6	30	. .	785	. .	795	. .	34.0	355 26 53.8	. .	— 4.4	46 33 10.6	+ 2.6
21	312 14	10 1.2	26.8	16.5	7.2	33	180	. .	200	. .	. .	34.0	312 18 14.7	. .	— 1 1.0	3 23 34.9	+ 5.0
22	41 44	2.0	26.8	19.0	5.5	31	360	420	. .	. .	. .	34.0	41 48 41.4	. .	+ 49.7	92 55 52.3	+ 3.7
23	0 10	4.0	0.3	21.3	9.6	35	. .	780	. .	790	. .	34.0	0 13 31.8	. .	+ 0.2	51 19 53.2	+ 2.3
24	306 6	1.3	27.7	15.7	7.6	38	. .	. .	110	. .	005	34.0	306 8 59.2	73.5	— 1 16.1	357 14 4.3	+ 1.3
25	16 14	0.0	27.5	16.7	6.4	31	. .	. .	. .	295	305	32.0	16 18 42.4	. .	+ 16.2	67 25 19.8	+ 1.3
26	22 18	6.9	2.4	24.6	12.2	30	. .	160	. .	210	. .	32.0	22 22 52.6	75.8	+ 22.8	73 29 36.6	+ 1.3
27	55 20	1.3	28.3	19.4	9.5	30	. .	450	. .	470	. .	32.0	55 24 52.6	. .	+ 1 20.2	106 32 34.0	+ 0.8
28	67 36	0.7	26.1	16.5	7.0	36	. .	545	. .	565	. .	32.0	67 39 21.2	. .	+ 2 13.8	118 47 56.2	— 0.2
29	16 36	3.0	0.1	20.0	7.9	31	. .	360	. .	390	. .	32.0	16 40 38.6	. .	+ 16.6	67 47 16.4	+ 2.3
30	6 40	4.5	1.3	22.8	10.7	34	. .	410	. .	475	. .	32.0	6 43 49.2	. .	+ 6.5	57 50 16.9	+ 0.3
31	33 16	4.5	0.0	20.9	9.8	32	. .	670	. .	690	. .	32.0	33 20 17.1	. .	+ 36.3	84 27 14.6	— 0.3
32	10 30	3.2	0.0	21.0	9.8	34	. .	530	. .	565	. .	32.0	10 33 48.9	. .	+ 10.3	61 40 20.4	+ 1.2
33	17 48	1.1	27.8	20.8	7.7	30	. .	. .	. .	500	510	32.0	17 52 52.8	. .	+ 17.8	68 59 31.8	. .
34	17 58	2.5	28.8	21.0	7.5	33	680	. .	. .	. .	675	32.0	18 2 3.4	. .	+ 18.0	69 8 42.6	. .
35	17 58	2.5	28.8	21.0	7.5	34	. .	485	. .	435	. .	32.0	18 1 51.3	. .	+ 18.0	69 8 30.5	. .
36	22 6	2.7	28.8	18.5	6.7	32	120	150	. .	. .	. .	32.0	22 10 27.7	80.5	+ 22.4	73 17 11.3	. .
37	21 34	2.3	29.0	20.5	8.3	30	. .	. .	. .	445	500	32.0	21 38 52.3	. .	+ 21.8	72 45 35.3	. .
38	336 24	2.0	27.6	18.0	7.8	32	. .	190	. .	220	. .	32.0	336 28 27.4	. .	— 23.8	27 34 24.8	— 0.6
39	17 36	2.7	29.5	21.6	7.8	30	. .	420	. .	510	. .	32.0	17 40 52.0	. .	+ 17.4	68 47 30.6	+ 1.6
40	23 32	3.8	1.0	21.0	9.7	29	. .	920	. .	990	. .	32.0	23 36 58.9	. .	+ 23.9	74 43 44.0	— 1.5
41	344 26	2.8	29.8	19.0	5.0	32	. .	060	. .	080	. .	32.0	344 30 29.0	. .	— 15.2	35 36 35.0	+ 2.2
42	41 20	5.8	29.3	20.8	9.5	34	. .	250	. .	. .	470	32.0	41 23 59.0	84.2	+ 48.0	92 31 8.2	. .
43	29 14	5.8	29.8	22.3	9.3	30	. .	075	. .	095	. .	34.2	29 18 58.6	. .	+ 31.0	80 25 50.8	+ 4.1
44	5 4	1.5	29.2	18.4	7.4	32	. .	005	. .	000	. .	34.2	5 8 32.1	76.3	+ 5.0	56 14 58.3	+ 3.6
45	24 18	6.0	0.9	22.0	10.4	36	. .	810	. .	850	. .	34.2	24 21 14.8	. .	+ 25.0	75 28 1.0	+ 4.0
46	59 46	3.0	27.7	18.7	8.5	30	. .	565	. .	615	. .	34.2	59 50 53.0	. .	+ 1 34.9	110 58 49.1	— 11.4
47	352 28	5.5	1.8	21.0	10.0	34	. .	440	. .	480	. .	34.2	352 31 51.6	. .	— 7.3	43 38 5.5	+ 4.1
48	62 40	5.5	27.7	21.6	8.3	34	215	245	. .	. .	. .	34.2	62 43 55.5	. .	+ 1 46.9	113 52 3.6	— 11.6
49	66 36	2.6	27.9	14.5	5.7	33	350	. .	. .	. .	455	34.2	66 39 56.2	. .	+ 2 7.5	117 48 24.9	. .
50	66 36	2.6	27.9	14.5	5.7	35	. .	835	. .	835	. .	34.2	66 39 34.5	. .	+ 2 7.5	117 48 3.2	. .

No.	Barom.	At. Ther.
	in.	°
1	30.05	78.0
24	30.05	74.0
26	30.05	75.0
36	30.04	79.8
42	30.02	83.0
44	30.00	76.6

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
12	— 16.2	— 10.3	. .	— 26.5
13	— 16.2	+ 10.3	0.0	— 5.9
33	— 2.5	— 3.0	. .	— 5.5
34	— 1.7	— 6.1	. .	— 7.8
35	— 1.7	+ 6.1	— 0.1	+ 4.1
36	— 3.3	— 15 48.0	. .	— 15 51.3
37	— 3.3	+ 15 48.0	. .	+ 15 44.7
42	— 36 47.8	+ 15 15.0	. .	— 21 30.8
49	— 15.4	— 10.9	. .	— 26.3
50	— 15.4	+ 10.9	— 0.1	— 4.6

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Aug. 5	1	α Ophiuchi . . .	E.	. .	. .	. .	. .	. .	. .	. .	57.3	0.0	29 47.39	− 0.43	−36.56	−36.54	17 29 10.42	+ 0.05
	2	B. A. C. 5990 . .	E.	17.5	21.2	23.4	32.2	35.0	38.2	47.0	49.2	52.9	36 35.18	0.00	. .	−36.53	17 35 58.65	− 2.30
	3	XVII, 19 . . .	E.	40.1	43.3	45.3	52.8	55.3	57.9	5.6	7.4	10.6	43 55.37	− 0.85	. .	−36.53	17 43 17.99	− 3.37
	4	XVII, 21 . . .	E.	57.9	1.0	2.7	10.2	12.7	15.2	22.5	24.3	27.4	45 12.66	− 0.83	. .	−36.55	17 44 35.28	− 3.30
	5	γ Draconis . . .	E.	1.3	5.5	8.0	17.8	21.0	24.4	34.3	36.7	40.8	54 21.09	+ 0.12	. .	−36.55	17 53 44.66	− 0.06
	6	γ² Sagittarii . . .	P.	12.9	15.9	17.6	24.9	27.1	29.6	36.6	38.3	41.4	58 27.14	− 0.79	−36.35	−36.34	17 57 50.01	+ 0.02
	7	B. A. C. 6162 . .	E.	5.0	8.5	10.5	19.0	21.9	24.7	33.2	35.5	38.9	4 21.91	− 0.05	. .	−36.56	18 3 45.30	− 2.38
	8	δ Ursæ Minoris. .	E.	46.0	29.5	54.5	. .	. .	. .	31.5	57.0	39.0	13 12.90	+ 9.51	. .	−36.56	18 12 45.85	+ 0.28
	9	δ Ursæ Minoris. .	P.	. .	. .	3.5	37.5	12.0	45.0	21.5	. .	. .	13 11.90	+ 9.51	. .	−36.34	18 12 45.07	− 0.50
	10	XVIII, 15 . . .	E.	35.6	38.7	40.5	47.7	50.3	52.5	59.9	1.6	4.9	30 50.19	− 0.82	. .	−36.58	18 30 12.79	− 3.53
	11	B. A. C. 6365 . .	E.	21.6	24.9	26.8	34.6	37.1	39.8	47.6	49.5	52.9	36 37.20	− 0.14	. .	−36.58	18 36 0.48	− 2.47
	12	51 Cephei, S. P. .	E.	14.0	22.0	49.0	. .	. .	. .	10.0	40.0	. .	42 0.17	−13.18	. .	−36.58	6 41 10.41	+ 0.45
	13	51 Cephei, S. P. .	P.	. .	. .	27.0	43.0	0.0	17.0	37.0	. .	. .	42 0.80	−13.18	. .	−36.36	6 41 11.26	+ 1.30
	14	Piazzi VII, 67, S. P.	E.	4.8	57.7	53.4	36.7	31.0	25.1	8.1	4.2	57.0	18 30.89	− 2.26	. .	−36.60	7 19 52.03	− 0.03
	15	δ Aquilæ	E.	. .	. .	. .	. .	. .	. .	. .	1.6	4.0	19 51.80	− 0.52	−36.66	−36.60	19 19 14.68	+ 0.11
	16	κ Aquilæ	P.	40.4	41.9	46.1	48.1	50.1	52.3	54.3	58.2	59.8	30 50.13	− 0.60	−36.49	−36.40	19 30 13.13	+ 0.13
	17	B. A. C. 6731 . .	E.	7.6	11.3	13.4	22.0	24.8	27.8	36.1	38.2	41.9	33 24.79	− 0.04	. .	−36.61	19 32 48.14	− 2.55
	18	B. A. C. 6762 . .	E.	14.4	17.4	19.0	25.9	28.2	30.5	37.4	39.0	41.9	39 28.19	− 0.29	. .	−36.61	19 38 51.29	− 2.65
	19	γ Aquilæ	E.	46.5	49.0	50.6	56.8	58.9	1.0	7.1	8.7	11.4	40 58.89	− 0.46	−36.58	−36.61	19 40 21.82	0.00
	20	α Aquilæ	E.	8.6	11.1	12.8	18.9	21.0	23.1	29.3	30.9	33.5	45 21.02	− 0.47	−36.61	−36.61	19 44 43.94	+ 0.04
	21	β Aquilæ. . . .	P.	38.0	40.5	42.0	48.0	50.3	52.4	58.5	59.8	2.6	49 50.23	− 0.49	−36.48	−36.41	19 49 13.33	+ 0.10
	22	B. A. C. 6882 . .	E.	53.0	55.9	57.5	4.3	6.5	8.7	15.4	17.0	19.9	57 6.47	− 0.32	. .	−36.63	19 56 29.52	− 2.69
	23	μ Geminorum . .	Sk.	48.6	51.4	53.2	57.4	59.7	1.9	. .	12.5	15.2	16 1.93	− 0.30	−36.84	−36.89	6 15 24.74	− 0.09
	24	γ Geminorum . .	Sk.	54.7	57.3	59.0	5.3	7.5	9.6	16.0	17.6	20.4	31 7.49	− 0.35	−36.89	−36.90	6 30 30.24	− 0.04
	25	α Canis Majoris. .	Sk.	3.4	5.9	7.4	13.9	16.0	18.2	24.6	26.2	28.9	40 16.06	− 0.56	−37.02	−36.91	6 39 38.59	+ 0.03
6	26	Sun I, N. . . .	Sk.	17.4	19.9	21.4	28.0	30.0	32.2	38.6	40.0	42.8	4 30.03	− 0.35	. .	−36.98	9 3 52.70	. .
	27	Sun II, S. . . .	Sk.	29.5	32.0	33.6	40.0	42.2	44.4	50.7	52.0	55.0	6 42.16	− 0.35	. .	−36.98	9 6 4.83	. .
	28	δ Leonis	Sk.	52.6	55.4	57.0	3.5	5.7	7.9	14.6	16.0	18.9	8 5.73	− 0.31	−37.06	−37.09	11 7 28.33	− 0.09
	29	β Leonis	Sk.	. .	. .	15.1	17.2	19.2	21.4	23.6	. .	. .	43 19.30	− 0.36	−37.09	−37.11	11 42 41.83	− 0.04
	30	β Corvi	Sk.	14.5	17.4	19.0	25.7	27.9	30.0	36.7	38.4	41.2	28 27.87	− 0.59	−37.19	−37.14	12 27 50.14	+ 0.01
	31	12 Canum Venat. .	Sk.	33.3	36.6	38.6	46.5	49.2	51.9	59.6	1.5	4.9	50 49.12	− 0.13	−37.09	−37.15	12 50 11.84	− 0.06
	32	Polaris, S. P. . .	Sk.	. .	. .	. .	. .	. .	. .	24.0	20.5	32.0	14 9.30	−22.64	. .	−37.17	1 13 9.49	+ 0.09
8	33	B. A. C. 2194 . .	P.	. .	. .	50.9	53.0	55.5	. .	4.4	6.0	8.9	36 55.36	− 0.29	. .	−39.69	6 36 15.38	− 0.95
	34	α Canis Majoris. .	P.	6.2	8.9	10.4	16.8	19.0	21.1	27.6	29.0	31.8	40 18.98	− 0.59	−39.85	−39.66	6 39 38.73	+ 0.11
	35	ε Canis Majoris. .	P.	9.2	12.1	13.8	20.8	23.2	25.5	32.5	34.2	37.2	54 23.17	− 0.68	−39.69	−39.67	6 53 42.82	− 0.03
	36	δ Canis Majoris. .	P.	45.3	48.2	49.9	54.4	59.0	3.9	8.0	9.7	12.6	3 59.00	− 0.66	−39.78	−39.67	7 3 18.67	+ 0.06
	37	δ Geminorum . .	P.	. .	. .	. .	. .	22.4	24.6	29.2	30.8	33.2	13 20.20	− 0.30	−39.69	−39.68	7 12 40.22	− 0.05
	38	α² Geminorum . .	P.	3.8	6.7	8.5	15.8	18.3	20.4	27.8	29.5	32.6	27 18.36	− 0.19	−39.81	−39.69	7 26 38.28	+ 0.36
	39	α Canis Minoris .	P.	14.0	16.4	18.0	24.0	26.1	28.3	34.4	35.8	38.4	33 26.16	− 0.44	−39.74	−39.69	7 32 46.03	− 0.11
	40	Mercury II, S. .	P.	9.2	11.7	13.4	19.9	22.1	24.3	30.9	32.4	35.6	25 22.17	− 0.32	. .	−39.74	8 24 42.11	− 0.20
	41	Venus II, S. . .	P.	47.0	49.7	51.6	58.1	0.1	2.2	8.8	10.3	13.4	29 0.13	− 0.32	. .	−39.74	8 28 20.07	− 0.36
	42	Venus, N. . . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
9	43	Sun I, N. . . .	P.	47.7	50.5	52.0	58.3	0.5	2.4	8.9	10.7	13.4	16 0.49	− 0.35	. .	−39.78	9 15 20.36	. .
	44	Sun II, S. . . .	P.	59.5	2.3	3.9	10.4	12.3	14.4	20.7	22.4	25.0	18 12.32	− 0.35	. .	−39.78	9 17 32.19	. .
	45	β Leonis	P.	. .	. .	20.0	22.0	24.1	26.3	30.5	32.1	34.8	43 22.04	− 0.36	−39.85	−39.84	11 42 41.84	− 0.01
	46	Polaris, S. P. . .	P.	. .	. .	. .	42.2	16.0	47.0	. .	. .	. .	14 14.95	−24.67	. .	−39.90	1 13 10.38	− 1.68
	47	β Bootis	P.	. .	. .	50.6	53.2	56.0	58.7	1.3	. .	. .	57 55.96	− 0.06	. .	−39.96	14 57 15.94	+ 0.04
	48	β Libræ	P.	47.0	49.6	51.0	57.2	59.3	1.4	7.6	9.1	11.7	10 59.32	− 0.54	−40.02	−39.96	15 10 18.82	+ 0.06
	49	μ¹ Bootis	P.	12.4	15.7	17.6	25.5	28.0	30.6	38.2	40.0	43.4	20 27.93	− 0.11	−39.93	−39.97	15 19 47.85	− 0.05
	50	Moon I, N. . .	P.	3.3	6.2	7.8	14.8	17.0	19.3	26.1	27.9	30.7	30 17.01	− 0.65	. .	−39.97	15 29 36.39	+66.54

4. Microscope I reduced for 5''.0.
8. Bisections at sets B and D.
10. Wire B used.
12. Bisections at wires B_2 and D_2.
50. Bisections at set C.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	26 10	10 5.7	0.2	20.2	11.5	33	. .	. .	. .	540	545	34.2	26 14 5.6	. .	+ 27.3	77 20 54.1	+ 2.8
2	352 46	6.1	1.3	23.2	10.3	36	. .	. .	. .	655	695	34.2	352 49 17.6	. .	− 7.0	43 55 31.8	+ 4.1
3	75 12	9.0	2.5	23.6	12.0	32	810	830	. .	. .	. .	34.2	75 16 13.5	. .	+ 3 27.0	126 26 1.7	−13.5
4	72 52	0.0	28.5	20.0	9.0	34	. .	910	. .	040	. .	34.2	72 55 44.6	. .	+ 2 58.1	124 5 3.9	−12.8
5	347 20	3.1	28.3	19.7	7.7	35	. .	790	. .	800	. .	34.2	347 23 33.7	. .	− 12.4	38 29 42.5	+ 2.5
6	69 12	7.2	0.7	20.4	9.8	30	. .	700	. .	730	. .	34.2	69 16 48.5	. .	+ 2 25.3	120 25 35.0	+ 0.3
7	355 22	4.0	29.2	19.4	7.3	30	. .	580	. .	605	. .	34.2	355 26 52.9	. .	− 4.4	46 33 9.7	+ 3.9
8	312 14	4.2	29.5	18.2	10.1	33	400	. .	. .	. .	415	34.2	312 18 10.3	. .	− 1 0.9	3 23 30.6	+ 1.9
9	312 14	4.2	29.5	18.2	10.1	33	330	. .	. .	. .	285	34.2	312 18 10.7	. .	− 1 0.9	3 23 31.0	+ 2.3
10	71 38	4.3	28.3	18.3	7.8	38	. .	970	. .	980	. .	34.2	71 38 11.5	. .	+ 2 45.6	122 47 18.3	− 8.6
11	0 34	4.7	0.8	21.5	10.5	31	. .	970	. .	000	. .	34.2	0 38 29.6	. .	+ 0.6	51 44 51.4	+ 3.7
12	306 6	7.0	2.7	23.8	12.9	37	. .	730	. .	810	. .	34.2	306 8 57.5	. .	− 1 15.9	357 14 2.8	+ 1.2
13	306 6	7.0	2.7	23.8	12.9	37	. .	850	. .	820	. .	34.2	306 8 57.5	. .	− 1 15.9	357 14 2.8	+ 1.2
14	287 36	8.3	2.8	23.8	14.0	35	. .	235	. .	340	. .	34.2	287 39 35.1	. .	− 2 52.7	338 43 3.6	+ 1.8
15	35 56	3.7	28.2	20.5	7.4	30	. .	. .	. .	260	275	34.2	36 0 58.0	. .	+ 40.4	87 7 59.6	+ 3.9
16	46 6	3.8	28.4	20.4	7.3	30	. .	450	. .	490	. .	34.2	46 10 54.4	. .	+ 57.9	97 18 13.5	+ 3.1
17	354 24	4.3	0.1	24.8	8.0	31	. .	725	. .	775	. .	34.2	354 28 33.4	. .	− 5.4	45 34 49.2	+ 4.3
18	12 0	5.5	3.2	26.8	13.0	37	025	060	. .	. .	. .	34.2	12 3 9.2	. .	+ 11.9	63 9 42.3	+ 4.0
19	28 30	5.2	0.5	24.5	9.0	31	. .	840	. .	905	. .	34.2	28 34 30.8	. .	+ 30.3	79 41 22.3	+ 2.4
20	30 16	4.7	0.0	21.0	8.9	31	. .	155	. .	180	. .	34.2	30 20 42.7	. .	+ 32.6	81 27 36.5	+ 3.3
21	32 44	1.8	28.0	22.0	6.0	36	. .	. .	. .	970	. .	34.2	32 47 15.8	72.4	+ 35.9	83 54 12.9	+ 2.3
22	14 22	5.0	1.4	26.5	11.1	33	. .	550	. .	585	. .	34.2	14 26 3.8	72.4	+ 14.3	65 32 39.3	+ 4.3
23	16 14	4.4	2.9	24.5	11.7	30	. .	. .	. .	962	990	33.0	16 18 42.7	. .	+ 16.0	67 25 19.9	+ 1.4
24	22 18	5.8	1.9	23.9	11.8	30	. .	210	. .	308	. .	33.0	22 22 53.2	80.4	+ 22.6	73 29 37.0	+ 1.8
25	55 20	4.0	1.1	22.0	11.1	30	. .	228	. .	324	. .	33.0	55 24 54.1	. .	+ 1 19.3	106 32 34.6	+ 1.5
26	21 52	7.7	3.0	25.8	12.7	36	442	450	. .	. .	. .	33.0	21 55 17.1	. .	+ 21.9	73 2 0.2	. .
27	22 22	5.7	1.5	24.3	9.5	30	. .	. .	. .	432	470	33.0	22 26 50.9	84.3	+ 22.5	73 33 34.6	. .
28	17 36	6.5	2.5	26.0	10.7	30	. .	270	. .	282	. .	33.0	17 40 52.4	. .	+ 17.3	68 47 30.9	+ 1.9
29	23 32	6.1	2.4	25.8	10.7	29	. .	540	. .	610	. .	33.0	23 37 3.3	86.0	+ 23.7	74 43 48.2	+ 2.6
30	61 30	6.2	0.7	23.5	12.1	31	. .	614	. .	638	. .	33.0	61 34 32.3	. .	+ 1 39.5	112 42 33.0	+ 2.7
31	359 50	3.8	0.5	21.3	8.7	33	. .	810	. .	838	. .	33.0	359 54 1.1	. .	− 0.1	51 0 22.2	+ 3.0
32	307 30	4.8	2.9	21.2	13.0	36	. .	. .	. .	390	290	33.0	307 33 17.8	86.0	− 1 10.2	358 38 28.8	+ 0.5
33	13 34	2.9	1.0	21.8	11.5	33	. .	203	. .	334	. .	32.3	13 38 8.0	. .	+ 13.5	64 44 42.7	+ 7.7
34	55 20	6.4	2.7	21.9	13.2	30	. .	294	. .	370	. .	32.3	55 24 51.0	75.4	+ 1 20.4	106 32 32.6	0.0
35	67 36	0.2	26.1	15.2	7.2	36	. .	742	. .	. .	760	32.3	67 39 19.0	. .	+ 2 14.0	118 47 54.2	− 1.4
36	65 0	5.6	29.5	19.1	11.3	37	. .	051	. .	061	. .	32.3	65 3 10.1	. .	+ 1 58.5	116 11 29.8	+ 0.5
37	16 36	4.0	0.6	19.0	9.0	31	. .	. .	. .	465	. .	32.3	16 40 37.0	. .	+ 16.6	67 47 14.8	+ 0.7
38	6 40	6.1	4.0	21.5	13.7	34	. .	. .	. .	395	370	32.3	6 43 49.5	. .	+ 6.5	57 50 17.2	+ 0.2
39	33 16	3.5	29.7	18.8	9.7	32	. .	720	. .	770	. .	32.3	33 20 17.3	. .	+ 36.4	84 27 14.9	+ 0.2
40	18 36	4.0	0.5	18.7	10.0	29	. .	425	. .	450	. .	32.3	18 41 7.6	. .	+ 18.6	69 47 47.4	. .
41	18 56	2.8	0.3	18.6	9.2	32	490	. .	. .	. .	495	32.3	19 0 21.6	. .	+ 19.0	70 7 1.8	. .
42	18 56	2.8	0.3	18.6	9.2	33	. .	100	. .	125	. .	32.3	19 0 12.0	80.2	+ 19.0	70 6 52.2	. .
43	22 42	3.7	0.0	21.7	9.0	33	590	585	. .	. .	. .	32.3	22 46 3.9	. .	+ 23.0	73 52 48.1	. .
44	23 14	3.9	28.3	24.2	7.7	35	. .	. .	. .	170	220	32.3	23 17 39.3	81.6	+ 23.6	74 24 24.1	.
45	23 32	5.3	0.8	18.0	10.6	29	. .	590	. .	635	. .	32.3	23 37 4.6	84.1	+ 23.9	74 43 49.7	+ 4.0
46	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	.	. . . .	. .	. .	. . . .	. .
47	357 56	5.4	0.8	17.5	8.8	31	. .	. .	. .	630	640	32.8	358 0 35.4	83.0	− 2.0	49 6 54.6	+ 2.1
48	47 44	3.7	0.8	18.2	8.3	33	. .	600	. .	685	. .	32.8	47 48 4.1	. .	+ 1 0.3	98 55 25.6	+ 2.6
49	1 0	5 7	0.2	20.2	5.6	31	. .	395	. .	435	. .	32.8	1 4 38.4	. .	+ 1.0	52 11 0.6	+ 3.5
50	62 12	6.3	2.5	22.1	12.8	35	200	. .	125	. .	005	32.8	62 15 38.5	. .	+ 1 44.0	113 23 43.7	. .

No.	Barom.	At. Ther.
	in.	°
21	29.99	73.5
22	29.99	73.5
24	29.96	78.8
27	29.94	82.8
32	29.86	85.0
34	30.07	73.3
42	30.08	78.6
44	30.07	79.6
45	30.05	83.5
47	30.03	80.8

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
26	− 3.3	+ 15 47.2	. .	+ 15 43.9
27	− 3.3	− 15 47.2	. .	− 15 50.5
40	− 2.3	− 2.8	. .	− 5.1
41	− 1.7	− 4.8	. .	− 6.5
42	− 1.7	+ 4.8	0.0	+ 3.1
43	− 4.8	+ 15 48.0	. .	+ 15 43.2
44	− 4.7	− 15 48.0	. .	− 15 52.7
50	−47 52.7	+ 14 48.7	. .	− 33 4.0

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Aug. 9	1	α Serpentis	P.	36.7	39.2	40.8	46.9	49.0	51.0	57.3	58.8	1.4	38 49.01	− 0.43	−39.94	−39.98	15 38 8.60	− 0.02
	2	ε Serpentis	P.	5.3	7.9	9.3	15.5	17.6	19.6	25.7	27.2	29.9	45 17.56	− 0.44	−39.96	−39.98	15 44 37.14	− 0.02
	3	B. A. C. 5284	P.	10.3	12.9	14.7	21.0	23.0	25.2	31.6	33.1	35.8	51 23.07	− 0.35	. .	−39.99	15 50 42.73	+ 1.96
	4	τ Herculis	P.	23.0	27.0	29.0	38.0	41.0	44.1	53.0	55.2	58.9	16 41.02	+ 0.04	. .	−40.00	16 16 1.06	+ 0.22
	5	A Draconis	P.	20.8	28.3	32.3	49.5	55.0	0.6	17.9	22.2	29.5	28 55.12	+ 0.89	. .	−40.00	16 28 16.01	− 0.17
	6	9 Camelopard., S. P.	P.	51.8	45.5	41.8	26.9	21.7	16.7	1.3	57.8	51.2	42 21.63	− 1.91	. .	−40.02	4 41 39.70	+ 0.20
	7	B. A. C. 5731	P.	58.5	1.4	3.3	10.4	12.7	15.1	22.3	24.2	27.1	56 12.78	− 0.20	. .	−40.02	16 55 32.56	− 2.15
	8	ε Ursæ Minoris.	P.	58.0	17.5	28.4	14.3	28.7	44.6	29.8	41.0	59.4	0 29.08	+ 3.54	. .	−40.03	16 58 52.59	− 0.72
	9	B. A. C. 5834	P.	8.7	11.8	13.7	21.5	23.9	26.5	34.0	36.0	39.2	11 23.92	− 0.11	. .	−40.03	17 10 43.78	− 2.17
	10	44 Ophiuchi	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	11	Mars I, N.	P.	49.8	52.5	54.4	. .	. .	. .	12.8	14.5	17.4	29 3.57	− 0.69	. .	−40.03	17 28 22.85	+ 0.70
	12	Mars II, S.	P.	. .	. .	0.3	2.6	4.8	7.0	9.5	. .	. .	29 4.84	− 0.69	. .	−40.03	17 28 24.12	− 0.57
	13	22 Camelopard., S. P.	P.	22.2	14.9	10.7	53.1	47.6	41.9	24.3	19.9	12.8	5 47.49	− 2.14	. .	−40.07	6 5 5.28	+ 0.27
	14	δ Ursæ Minoris.	P.	. .	. .	5.0	41.0	15.0	. .	24.0	. .	. .	13 14.94	+ 9.92	. .	−40.07	18 12 44.79	+ 0.39
	15	1 Aquilæ.	P.	55.4	58.0	59.6	5.7	7.8	9.9	16.0	17.7	20.3	29 7.82	− 0.54	−40.08	−40.08	18 28 27.20	+ 0.07
	16	51 Cephei, S. P.	P.	. .	. .	29.0	47.0	5.0	22.0	39.0	. .	. .	42 4.40	−12.30	. .	−40.09	6 41 12.01	+ 0.72
	17	Piazzi VII, 67, S. P.	P.	7.8	0.7	56.5	39.9	34.0	28.8	11.7	7.2	0.4	18 34.11	− 2.09	. .	−40.11	7 17 51.91	− 0.34
	18	δ Aquilæ.	P.	. .	. .	53.1	55.2	57.2	59.3	3.4	5.0	7.4	19 55.19	− 0.45	−40.12	−40.11	19 19 14.63	+ 0.06
	19	γ Aquilæ.	P.	49.8	52.5	54.0	0.2	2.3	4.4	10.6	12.2	14.7	41 2.30	− 0.40	−40.05	−40.12	19 40 21.78	− 0.04
	20	α Aquilæ.	P.	12.0	14.6	16.2	22.3	24.3	26.4	32.5	34.1	36.7	45 24.34	− 0.41	−39.99	−40.12	19 44 43.81	− 0.09
	21	ν Cygni	P.	57.6	0.8	2.9	10.9	13.6	16.3	24.4	26.4	29.8	53 13.63	− 0.06	−40.10	−40.16	20 52 33.41	0.00
	22	B. A. C. 7398	P.	57.8	0.8	2.8	10.7	13.3	16.0	23.8	25.6	29.0	13 13.31	− 0.11	. .	−40.14	21 12 33.06	− 2.64
	23	1 Draconis, S. P.	P.	16.3	58.2	46.6	4.4	49.5	34.8	51.0	40.8	21.6	19 49.24	− 4.59	. .	−40.18	9 19 4.47	− 0.68
	24	B. A. C. 7502	P.	48.4	51.4	53.2	0.5	2.9	5.4	12.8	14.6	17.8	30 3.00	− 0.74	. .	−40.15	21 29 22.11	− 3.91
	25	Saturn I, N.	P.	20.7	23.3	24.9	. .	. .	. .	41.8	43.4	46.0	44 33.35	− 0.59	. .	−40.16	21 43 52.60	. .
	26	Saturn II, S.	P.	. .	. .	30.4	32.5	34.6	36.7	38.8	. .	. .	44 34.60	− 0.59	. .	−40.16	21 43 53.85	. .
	27	79 Draconis	P.	18.8	27.4	32.8	53.7	0.8	7.9	28.9	34.0	42.6	52 0.77	+ 1.27	. .	−40.20	21 51 21.84	+ 0.08
	28	B. A. C. 7714	P.	19.3	22.2	24.0	31.3	33.8	36.1	43.5	45.4	48.5	3 33.79	− 0.73	. .	−40.16	22 2 52.90	− 3.82
	29	32 Ursæ Minoris, S. P.	P.	8.6	2.2	58.5	43.9	39.0	33.6	18.8	15.2	8.9	9 38.74	− 1.89	. .	−40.21	10 8 56.64	− 0.04
	30	π Aquarii.	P.	24.9	27.5	29.1	35.1	37.3	39.3	45.4	47.0	49.5	19 37.23	− 0.47	−40.22	−40.21	22 18 56.55	− 0.03
	31	9 Draconis, S. P.	P.	0.0	48.8	42.5	16.9	7.8	59.4	33.2	26.9	16.3	25 7.98	− 2.97	. .	−40.22	10 24 24.79	− 0.36
	32	ζ Pegasi	P.	44.7	47.2	48.8	55.0	57.0	59.0	5.3	6.8	9.5	35 57.03	− 0.40	−40.16	−40.23	22 35 16.40	− 0.01
	33	B. A. C. 7944	P.	9.5	12.7	14.8	22.6	25.3	27.9	35.9	37.7	41.3	41 25.30	− 0.79	. .	−40.18	22 40 44.33	− 3.91
	34	λ Aquarii	P.	37.0	39.6	41.0	47.3	49.4	51.5	57.6	59.0	1.8	46 49.36	− 0.54	−40.24	−40.24	22 46 8.58	+ 0.08
	35	α Piscis Australis	P.	14.6	17.8	19.5	26.5	28.9	31.3	38.4	40.0	43.2	51 28.91	− 0.71	−40.23	−40.24	22 50 47.96	+ 0.03
	36	α Pegasi	P.	2.7	5.3	6.8	13.4	15.4	17.6	23.9	25.4	28.0	59 15.39	− 0.36	−40.19	−40.25	22 58 34.78	− 0.03
	37	β Geminorum	Sk.	7.6	10.5	12.2	19.0	21.4	23.8	30.7	32.6	35.4	38 21.47	− 0.16	−40.59	−40.50	7 37 40.81	+ 0.06
	38	Mercury II, S.	Sk.	. .	. .	22.4	24.5	26.7	28.9	31.0	. .	. .	33 26.70	− 0.28	. .	−40.61	8 32 45.81	− 0.20
10	39	Sun I, N.	Sk.	36.5	39.3	40.7	47.0	49.4	51.4	57.7	59.4	2.0	19 49.27	− 0.33	. .	−40.62	9 19 8.32	. .
	40	Sun II, S.	Sk.	48.3	50.8	52.4	58.7	0.8	3.0	9.3	11.0	13.7	22 0.89	− 0.33	. .	−40.62	9 21 19.94	. .
	41	α Leonis	Sk.	12.0	14.5	16.1	22.4	24.5	26.5	32.8	34.4	37.0	2 24.47	− 0.36	−40.65	−40.57	10 1 43.54	+ 0.04
	42	γ^1 Leonis	Sk.	. .	42.0	44.1	46.4	48.6	50.7	55.2	56.6	59.4	13 46.35	− 0.27	−40.63	−40.57	10 13 5.51	+ 0.04
	43	α Ursæ Majoris	Sk.	14.2	19.8	23.0	36.4	40.8	45.0	58.4	1.5	7.2	56 40.70	+ 0.78	. .	−40.59	10 56 0.89	+ 0.28
	44	Moon I	Sk.	1.9	4.9	6.7	13.7	16.0	18.4	25.2	27.2	30.2	22 16.02	− 0.78	. .	−40.74	16 21 34.50	+68.40
	45	ζ Ophiuchi	Sk.	48.0	50.5	52.0	58.2	0.4	2.4	8.6	10.3	12.9	31 0.37	− 0.62	−40.79	−40.79	16 30 18.96	0.00
	46	η Herculis	Sk.	3.8	7.0	9.0	16.7	19.4	22.3	30.0	32.1	35.4	39 19.52	− 0.03	−40.79	−40.79	16 38 38.70	+ 0.01
	47	κ Ophiuchi	Sk.	16.0	18.7	20.3	26.4	28.5	30.6	38.8	38.4	41.0	52 28.52	− 0.43	−40.73	−40.79	16 51 47.30	− 0.02
	48	ε Ursæ Minoris	Sk.	58.0	18.0	28.5	14.0	29.5	44.5	. .	. .	. .	59 29.29	+ 4.47	. .	−40.80	16 58 52.96	− 0.18
	49	δ Ursæ Minoris	Sk.	. .	. .	4.5	39.5	14.0	48.0	23.0	. .	. .	13 13.80	+11.25	. .	−40.84	18 12 44.21	+ 0.14

23, 31. Bisections at sets B and D.
48. Bisections at set C.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	32 0	10 5.7	0.0	20.0	9.7	34	. .	020	. .	000	. .	32.8	32 3 57.5	. .	+ 34.5	83 10 53.2	+ 1.7
2	33 58	3.7	28.8	17.6	8.7	34	. .	645	. .	670	. .	32.8	34 1 49.2	. .	+ 37.2	85 8 47.6	+ 1.7
3	22 44	7.7	3.1	25.0	10.8	29	. .	460	. .	520	. .	32.8	22 49 4.0	. .	+ 23.2	73 55 48.4	− 2.7
4	352 14	4.7	1.4	21.2	9.6	37	. .	770	. .	835	. .	32.8	352 16 59.4	. .	− 7.5	43 23 13.1	+ 0.7
5	329 48	7.7	3.8	20.5	12.7	34	. .	580	. .	570	. .	32.8	329 51 47.3	. .	− 32.1	20 57 36.4	+ 1.4
6	285 0	8.5	4.0	22.8	14.6	31	. .	110	. .	200	. .	32.8	285 4 36.8	. .	− 3 22.2	336 7 35.8	− 0.1
7	7 42	8.2	3.6	22.0	12.2	30	. .	640	. .	630	. .	32.8	7 46 46.7	. .	+ 7.6	58 53 15.5	+ 2.1
8	316 36	4.1	0.2	19.0	10.5	33	. .	. .	. .	820	. .	32.8	316 40 3.5	. .	− 52.2	7 45 32.5	+ 1.1
9	1 52	6.8	1.8	19.8	10.8	31	. .	790	. .	850	. .	32.8	1 56 30.3	. .	+ 1.9	53 2 53.4	+ 3.4
10	62 52	5.8	28.8	18.5	9.8	35	. .	740	. .	790	. .	32.8	62 55 31.1	. .	+ 1 48.3	114 3 40.6	+ 1.8
11	66 34	4.6	28.0	17.3	9.0	36	870	930	. .	. .	. .	32.8	66 37 14.2	. .	+ 2 8.0	117 45 43.4	. .
12	66 34	4.6	28.0	17.3	9.0	35	. .	. .	.	695	735	32.8	66 37 33.0	. .	+ 2 8.0	117 46 2.2	. .
13	288 14	7.8	1.2	18.3	11.7	33	. .	600	. .	645	. .	32.8	288 18 8.6	. .	− 2 47.0	339 21 35.8	+ 2.0
14	312 14	6.5	1.6	19.4	14.0	33	220	. .	180	. .	175	32.8	312 18 8.6	. .	− 1 1.3	3 23 28.5	+ 0.8
15	47 8	4.1	28.3	18.0	8.2	32	. .	075	. .	115	. .	32.8	47 12 28.4	. .	+ 1 0.3	98 19 49.9	+ 1.1
16	306 6	4.5	0.2	17.0	10.0	37	. .	995	055	020	980	32.8	306 8 57.0	. .	− 1 16.4	357 14 1.8	+ 1.2
17	287 36	6.2	29.8	18.2	10.3	35	. .	. .	. .	395	295	32.8	287 39 36.2	. .	− 2 54.2	338 43 3.2	+ 3.4
18	35 56	4.3	27.7	17.5	7.0	30	. .	. .	. .	350	335	32.8	36 0 56.2	. .	+ 40.7	87 7 58.1	+ 2.8
19	28 30	5.5	0.0	18.4	9.5	31	. .	930	. .	000	. .	32.8	28 34 29.3	. .	+ 30.6	79 41 21.1	+ 1.8
20	30 16	7.2	1.7	18.7	10.5	31	. .	140	. .	195	. .	32.8	30 20 39.4	68.8	+ 32.9	81 27 33.5	+ 0.9
21	358 8	3.0	29.7	18.2	7.5	32	. .	470	. .	510	. .	32.8	358 12 22.8	. .	− 1.8	49 18 42.2	+ 2.1
22	359 58	2.7	29.0	18.6	7.4	36	. .	935	. .	965	. .	32.8	0 1 14.6	. .	0.0	51 7 35.8	+ 6.3
23	300 44	3.7	28.2	16.6	9.5	34	. .	765	850	790	. .	32.8	300 47 46.8	. .	− 1 33.9	351 52 34.1	+ 0.5
24	72 24	4.8	28.4	16.6	9.6	38	. .	160	. .	205	. .	32.8	72 26 54.9	. .	+ 2 55.5	123 36 11.6	+ 9.9
25	53 54	5.2	29.8	17.7	9.0	28	780	. .	. .	. .	840	32.8	53 59 17.8	. .	+ 1 17.1	105 6 56.1	. .
26	53 54	5.2	29.8	17.7	9.0	27	. .	685	. .	710	. .	32.8	53 59 35.0	. .	+ 1 17.1	105 7 13.1	. .
27	325 44	0.0	26.0	15.8	6.5	35	. .	775	. .	815	. .	32.8	325 47 35.5	. .	− 38.2	16 53 18.5	0.0
28	71 56	5.0	28.6	17.8	9.6	32	. .	850	. .	905	. .	32.8	72 0 15.7	. .	+ 2 51.0	123 9 27.9	+13.4
29	284 38	5.3	1.0	19.5	11.0	37	. .	265	. .	430	. .	32.8	284 41 5.3	. .	− 3 30.8	335 43 55.7	+ 3.7
30	38 4	2.0	26.2	15.3	7.3	33	. .	650	. .	700	. .	32.8	38 8 6.2	. .	+ 44.1	89 15 11.5	+ 1.9
31	295 12	7.5	2.2	20.3	13.3	29	730	. .	. .	. .	775	32.8	295 17 0.4	. .	− 1 58.4	346 21 23.2	+ 1.6
32	28 38	3.2	27.8	19.5	8.0	33	. .	220	. .	270	. .	32.8	28 42 11.0	. .	+ 30.8	79 49 3.0	+ 1.8
33	77 38	4.0	27.8	20.0	8.7	34	. .	585	. .	475	. .	32.8	77 41 50.5	. .	+ 4 11 4	128 52 23.1	+17.6
34	47 4	5.2	0.2	22.5	10.8	37	. .	530	. .	560	. .	32.8	47 7 2.5	. .	+ 1 0.5	98 14 24.2	+ 1.2
35	69 4	3.8	27.8	19.7	8.2	34	. .	020	. .	130	. .	32.8	69 7 57.7	. .	+ 2 26.3	120 16 45.2	+ 0.9
36	24 18	8.5	2.2	22.5	13.7	37	. .	390	. .	400	. .	32.8	24 21 2.8	67.8	+ 25.4	75 27 49.4	+ 1.6
37	10 30	7.3	3.3	25.0	13.7	34	. .	352	. .	412	. .	32.2	10 33 47.9	81.0	+ 10.2	61 40 19.3	− 0.2
38	18 56	3.3	0.0	20.2	8.2	34	440	450	. .	. .	. .	32.2	18 59 51.5	. .	+ 18.8	70 6 31.5	. .
39	23 0	4.5	0.6	20.4	8.5	35	773	781	. .	. .	. .	32.2	23 3 30.4	. .	+ 23.2	74 10 14.8	. .
40	23 32	5.5	0.7	21.0	10.7	37	. .	. .	. .	270	268	32.2	23 35 6.4	84.4	+ 23.8	74 41 51.4	. .
41	26 14	5.8	2.0	24.2	10.5	31	. .	482	. .	536	. .	32.2	26 18 33.5	. .	+ 26.9	77 25 21.6	+ 2.5
42	18 20	4.3	1.9	24.5	9.3	30	. .	. .	. .	000	988	32.2	18 24 57.7	. .	+ 18.1	69 31 37.0	+ 2.7
43	336 24	4.0	2.0	20.0	9.3	31	. .	. .	. .	926	984	32.2	336 28 29.7	. .	− 23.6	27 34 27.3	+ 0.6
44	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
45	49 8	4.4	29.8	19.2	9.1	35	. .	820	. .	890	. .	33.6	49 11 30.7	. .	+ 1 3.7	100 18 55.6	+ 3.7
46	359 40	7.7	4.3	26.3	11.5	33	. .	904	. .	918	. .	33.6	359 43 56.5	76.7	− 0.3	50 50 17.4	+ 2.2
47	29 14	9.1	4.0	25.5	11.8	29	. .	900	. .	950	. .	33.6	29 18 57.2	. .	+ 31.0	80 25 49.4	+ 3.1
48	316 36	5.4	2.2	21.5	11.6	33	510	. .	. .	. .	570	33.6	316 40 4.2	76.0	− 52.1	7 45 33.3	+ 2.1
49	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .

No.	Barom.	At Ther.
	in.	°
20	30.02	70.8
36	30.00	69.5
37	30.03	72.2
40	30.03	82.2
46	29.95	78.0
48	29.97	77.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
11	− 15.0	+ 9.4	. .	− 5.6
12	− 15.0	− 9.4	. .	− 24.4
25	− 0.9	+ 8.5	. .	+ 7.6
26	− 0.9	− 8.5	. .	− 9.4
38	− 2.4	− 2.8	. .	− 5.2
39	− 3.5	+ 15 48.3	. .	+ 15 44.8
40	− 3.5	− 15 48.3	. .	− 15 51.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Aug. 10	1	B. A. C. 6349 . .	Sk.	38.0	41.4	43.3	48.6	51.2	53.9	56.6	59.1	. .	31 53.85	− 0.04	. .	−40.77	18 31 13.04	− 2.40
	2	α Lyræ	Sk.	13.0	15.0	20.3	23.0	25.7	28.3	31.0	36.0	37.9	33 25.58	− 0.04	−40.74	−40.85	18 32 44.69	− 0.09
	3	B. A. C. 6395 . .	Sk.	33.9	38.4	41.0	52.0	55.6	59.1	9.9	12.6	17.0	40 55.50	+ 0.39	. .	−40.78	18 40 15.11	− 2.38
	4	β Lyræ	Sk.	56.7	59.8	1.6	6.4	11.4	16.2	21.0	22.9	26.0	46 11.33	− 0.14	−40.81	−40.86	18 45 30.33	− 0.02
13	5	ζ Pegasi	P.	47.9	50.6	52.2	58.3	0.4	2.5	8.7	10.3	12.9	36 0.42	− 0.34	−43.54	−43.58	22 35 16.50	+ 0.02
	6	α Piscis Australis .	P.	18.0	21.0	22.7	29.8	32.2	34.6	41.7	43.4	46.4	51 32.20	− 0.60	−43.55	−43.59	22 50 48.01	0.00
	7	α Pegasi	P.	6.2	8.7	10.3	16.6	18.7	20.8	27.3	28.9	31.4	59 18.77	− 0.31	−43.55	−43.59	22 58 34.87	− 0.01
	8	λ Draconis, S. P. .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	9	β Ceti	P.	53.0	55.6	57.2	3.6	5.8	7.7	14.4	16.0	18.6	38 5.77	− 0.53	−43.58	−43.62	0 37 21.62	+ 0.01
	10	32¹ Camelopard., S. P.	P.	. .	. .	33.8	14.0	53.4	33.3	13.3	. .	. .	48 53.56	− 5.28	. .	−43.63	12 48 4.65	+ 1.57
	11	32² Camelopard., S. P.	P.	. .	. .	41.2	22.0	1.7	41.3	20.8	. .	. .	49 1.40	− 5.28	. .	−43.63	12 48 12.49	+ 0.27
	12	Polaris	P.	. .	. .	47.3	11.8	39.6	4.4	31.3	. .	. .	13 38.88	+20.07	. .	−43.64	1 13 15.31	− 0.49
	13	B. A. C. 458 . .	P.	14.7	17.5	19.2	26.5	28.8	31.0	38.0	40.0	43.2	26 28.77	− 0.61	. .	−43.66	1 25 44.50	− 2.63
	14	B. A. C. 469 . .	P.	54.5	57.3	59.1	6.2	8.5	11.0	18.2	20.0	23.0	31 8.64	− 0.61	. .	−43.66	1 30 24.37	− 2.59
	15	B. A. C. 526 . .	P.	29.4	32.6	34.7	42.4	45.1	47.6	55.5	57.5	0.9	36 45.08	− 0.67	. .	−43.66	1 36 0.75	− 2.66
	16	B. A. C. 553 . .	P.	54.8	56.9	2.0	4.6	7.2	9.9	12.4	17.6	19.6	43 7.22	− 0.67	. .	−43.66	1 42 22.89	− 2.58
	17	β Arietis	P.	17.4	20.0	21.7	28.3	30.4	32.6	39.1	40.7	43.4	48 30.40	− 0.26	−43.66	−43.66	1 47 46.48	+ 0.02
	18	α Arietis	P.	40.6	43.3	45.5	. .	. .	. .	2.8	4.4	7.2	0 53.97	− 0.24	−43.75	−43.67	2 0 10.06	+ 0.09
	19	α Draconis S. P. .	P.	. .	. .	56.3	51.6	46.7	41.8	37.1	. .	. .	1 46.70	− 1.60	. .	−43.67	14 1 1.43	− 0.04
17	20	κ Ophiuchi . . .	P.	21.5	24.0	25.7	31.8	33.9	35.9	42.0	43.6	46.3	52 33.86	− 0.36	−46.22	−46.21	16 51 47.29	+ 0.05
	21	α¹ Herculis . . .	P.	32.9	35.7	37.2	43.6	45.6	47.8	4.0	5.6	8.4	9 45.64	− 0.33	−46.20	−46.21	17 8 59.10	+ 0.01
	22	B. A. C. 5863 . .	P.	33.2	36.0	37.9	45.2	47.5	49.9	57.5	59.3	2.3	16 47.64	− 0.16	. .	−46.21	17 16 1.27	− 2.08
18	23	α Canis Minoris. .	E.	22.0	24.5	26.0	32.1	34.2	36.3	42.5	44.0	46.5	33 34.23	− 0.42	−47.64	−47.64	7 32 46.17	− 0.16
	24	β Geminorum . .	E.	14.9	17.9	19.5	26.5	28.8	31.0	38.0	39.9	42.7	38 28.80	− 0.23	−47.64	−47.64	7 37 40.93	− 0.03
19	25	Sun I, S. . . .	E.	30.8	33.4	35.0	41.4	43.4	45.5	51.6	53.3	56.0	53 43.38	− 0.36	. .	−47.71	9 52 55.31	. .
	26	Sun II, N. . . .	E.	41.0	43.7	45.3	51.6	53.6	55.7	2.0	3.8	6.4	55 53.68	− 0.36	. .	−47.71	9 55 5.61	. .
	27	ε Canis Majoris. .	E.	18.0	22.7	27.4	29.7	32.1	34.4	36.6	41.4	46.0	54 32.03	− 0.65	−48.33	−48.40	6 53 42.98	− 0.12
	28	δ Canis Majoris. .	E.	54.0	56.9	58.6	5.5	7.7	10.0	16.8	18.7	21.4	4 7.73	− 0.64	−48.29	−48.41	7 3 18.68	− 0.17
	29	δ Geminorum . .	E.	15.9	18.7	20.4	27.1	29.2	31.2	38.0	39.6	42.5	13 29.18	− 0.26	−48.44	−48.41	7 12 40.51	− 0.03
	30	α² Geminorum . .	P.	12.6	15.4	17.3	24.7	26.8	29.2	36.5	38.4	41.5	27 26.93	− 0.15	−48.34	−48.20	7 26 38.58	+ 0.38
	31	α Canis Minoris .	P.	22.6	25.1	26.6	32.8	34.9	37.0	43.1	44.7	47.2	33 34.89	− 0.39	−48.31	−48.20	7 32 46.30	− 0.05
	32	β Geminorum . .	P.	15.5	18.3	20.0	27.1	29.3	31.6	39.0	40.4	43.3	38 29.39	− 0.20	−48.24	−48.20	7 37 40.99	+ 0.01
	33	Venus I, N. . .	P.	12.2	14.8	16.5	. .	. .	. .	33.6	35.3	37.9	24 25.05	− 0.31	. .	−48.32	9 23 36.42	+ 0.34
	34	Venus II, S. . .	P.	. .	. .	21.5	23.6	25.7	27.9	30.0	. .	. .	24 25.74	− 0.31	. .	−48.32	9 23 37.11	− 0.35
20	35	Sun I, N. . . .	P.	14.2	16.9	18.3	24.6	26.7	28.9	35.2	36.8	39.3	57 26.77	− 0.35	. .	−48.35	9 56 38.07	. .
	36	Sun II, S. . . .	P.	24.0	26.6	28.3	34.5	36.6	38.8	45.0	46.6	49.3	59 36.63	− 0.35	. .	−48.35	9 58 47.93	. .
	37	σ Scorpii	P.	13.2	16.2	17.8	24.6	26.9	29.2	35.9	37.5	40.6	14 26.88	− 0.65	. .	−48.50	16 13 37.73	− 2.22
	38	α Ophiuchi . . .	P.	. .	. .	55.0	57.2	59.3	1.4	3.5	. .	. .	29 59.28	− 0.36	−48.70	−48.47	17 29 10.45	+ 0.26
	39	B. A. C. 5988 . .	P.	34.8	37.7	39.4	46.0	48.3	50.7	57.3	59.1	2.0	36 48.37	− 0.25	. .	−48.52	17 35 59.60	− 2.18
	40	B. A. C. 6082 . .	P.	36.8	38.6	44.0	46.4	48.9	51.4	54.0	59.3	1.0	52 48.93	− 0.10	. .	−48.52	17 52 0.31	− 2.12
	41	γ Draconis . . .	P.	. .	. .	26.1	29.3	32.8	36.2	39.3	. .	. .	54 32.74	+ 0.16	. .	−48.48	17 53 44.42	+ 0.07
	42	22 Camelopard., S. P.	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	43	XVIII, 15 . . .	P.	. .	. .	. .	2.0	4.4	6.9	11.8	13.6	16.8	31 2.07	− 0.71	. .	−48.54	18 30 12.82	− 3.42
	44	α Lyræ	P.	17.6	20.7	22.7	30.6	33.2	35.8	43.6	45.5	49.0	33 33.19	− 0.08	−48.46	−48.50	18 32 44.61	− 0.02
	45	51 Cephei, S. P. .	P.	. .	. .	40.0	58.0	15.0	34.0	52.0	. .	. .	42 15.80	−12.01	. .	−48.50	6 41 15 29	− 0.52
	46	ζ Aquilæ	P.	18.8	21.4	23.0	29.3	31.4	33.5	39.7	41.3	44.0	0 31.38	− 0.35	−48.54	−48.51	18 59 42.52	+ 0.13
	47	B. A. C. 6599 . .	P.	37.3	40.4	42.4	50.2	52.7	55.3	3.1	5.1	8.5	12 52.78	− 0.09	. .	−48.55	19 12 4.14	− 2.39
	48	δ Aquilæ	P.	51.3	53.9	55.4	1.5	3.6	5.6	11.9	13.4	15.9	20 3.61	− 0.44	−48.60	−48.52	19 19 14.65	+ 0.13
	49	Mural Zones 176, 77	P.	51.7	54.6	56.3	3.2	5.4	7.8	14.7	16.3	19.2	29 5.47	− 0.66	. .	−48.56	19 28 16.25	− 3.52
	50	Mural Zones 176, 78	P.	. .	. .	. .	. .	. .	. .	53.1	54.8	57.8	29 44.01	− 0.66	. .	−48.56	19 28 54.79	− 3.52

10, 11. Bisections at sets B and D.
49. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	0 2	10 6.0	4.0	23.8	9.9	34	020	040	. .	. .	. .	33.6	0 5 56.0	. .	+ 0.1	51 12 17.3	+ 4.8
2	0 10	10.0	6.5	26.9	15.5	35	. .	646	. .	630	. .	33.6	0 13 27.8	. .	+ 0.2	51 19 49.2	+ 0.9
3	343 26	5.9	3.0	23.5	10.2	37	608	688	. .	. .	. .	33.6	343 29 1.2	. .	− 16.4	34 35 6.0	+ 5.9
4	5 36	9.3	5.9	27.5	13.2	32	. .	155	. .	. .	. .	33.6	5 40 21.5	75.4	+ 5.5	56 46 48.2	+ 0.4
5	28 38	6.4	4.7	9.7	9.2	33	. .	280	. .	335	. .	33.8	28 42 10.6	. .	+ 30.7	79 49 2.5	+ 2.0
6	69 4	4.2	0.5	11.6	6.4	34	. .	205	. .	295	. .	33.8	69 7 57.8	. .	+ 2 26.0	120 16 45.0	+ 0.5
7	24 18	7.0	4.8	17.1	11.5	37	. .	615	. .	660	. .	33.8	24 21 1.7	68.5	+ 25.4	75 27 48.3	+ 1.4
8	288 54	8.0	5.1	14.3	11.0	35	. .	. .	. .	. .	140	33.8	288 57 38.8	. .	− 2 41.8	340 1 18.2	+ 3.2
9	57 28	2.4	0.4	12.8	7.7	33	. .	385	. .	375	. .	33.8	57 32 11.0	. .	+ 1 28.0	108 40 0.2	+ 1.4
10	302 56	4.4	3.0	13.2	10.3	29	835	. .	. .	. .	. .	33.8	303 1 2.6	. .	− 1 26.3	354 5 57.5	− 2.9
11	302 56	4.4	3.0	13.2	10.3	31	055	. .	. .	. .	. .	33.8	303 0 44.0	. .	− 1 26.3	354 5 38.9	+ 4.9
12	310 12	7.7	7.8	17.6	13.0	32	720	718	720	685	690	33.8	310 16 15.9	67.5	− 1 6.3	1 21 30.8	+ 1.9
13	69 24	3.5	0.2	13.0	7.4	32	. .	010	. .	020	. .	33.8	69 28 31.6	. .	+ 2 29.0	120 37 21.8	+28.4
14	69 20	7.1	2.5	15.5	9.5	35	. .	385	. .	475	. .	33.8	69 23 36.7	. .	+ 2 28.3	120 32 26.2	+28.5
15	77 32	8.8	6.2	15.0	12.8	37	. .	470	. .	520	. .	33.8	77 35 3.0	. .	+ 4 9.6	128 45 33.8	+30.3
16	76 32	7.8	4.0	14.4	10.0	32	. .	515	. .	. .	. .	33.8	76 36 20.6	. .	+ 3 51.4	127 46 33.2	+30.3
17	18 38	3.2	4.0	16.8	9.0	36	. .	485	. .	530	. .	33.8	18 41 20.9	. .	+ 19.0	69 48 1.1	+ 2.2
18	15 58	3.8	3.2	15.0	7.2	38	025	115	. .	. .	. .	33.8	16 0 57.7	. .	+ 16.2	67 7 35.1	+ 2.2
19	283 52	6.1	3.7	15.5	11.2	34	150	. .	. .	. .	. .	33.8	283 55 54.1	66.8	− 3 42.8	334 58 32.5	+ 4.1
20	29 14	4.2	2.8	13.0	7.6	30	. .	295	. .	290	. .	32.9	29 18 56.5	. .	+ 31.1	80 25 48.8	+ 3.0
21	24 18	8.0	6.1	18.0	10.7	36	. .	900	. .	935	. .	32.9	24 21 11.3	. .	+ 25.1	75 27 57.6	+ 1.7
22	6 12	5.9	6.5	18.0	10.8	34	. .	. .	. .	828	830	32.9	6 15 44.2	73.0	+ 6.1	57 22 11.5	+ 3.6
23	33 16	2.3	1.4	14.4	7.0	32	. .	870	. .	920	. .	32.8	33 20 17.2	76.0	+ 36.3	84 27 14.7	+ 0.5
24	10 30	6.4	6.5	18.5	11.8	34	. .	400	. .	410	. .	32.8	10 33 49.7	. .	+ 10.3	61 40 21.2	+ 1.1
25	26 18	5.6	4.3	15.2	4.1	31	230	255	. .	. .	. .	32.8	26 22 41.7	80.0	+ 27.1	77 29 30.0	. .
26	25 46	2.0	3.4	14.3	7 7	29	. .	. .	. .	985	995	32.8	25 51 1.1	. .	+ 26.5	76 57 48.8	. .
27	67 36	3.3	1.8	16.4	8.8	36	. .	615	. .	715	. .	32.1	67 39 17.2	. .	+ 2 14.6	118 47 53.0	− 0.3
28	65 0	5.3	4.4	16.5	10.0	36	. .	995	. .	030	. .	32.1	65 3 10.4	. .	+ 1 59.1	116 11 30.7	+ 3.5
29	16 36	1.3	3.0	16.3	5.9	31	. .	470	. .	475	. .	32.1	16 40 38.0	74.0	+ 16.7	67 47 15.9	+ 1.5
30	6 40	4.3	5.6	19.0	9.8	34	. .	495	. .	. .	. .	32.1	6 43 48.6	. .	+ 6.6	57 50 16.4	− 1.4
31	33 16	1.5	2.0	13.7	7.0	32	. .	960	. .	975	. .	32.1	33 20 15.5	. .	+ 36.6	84 27 13.3	− 0.8
32	10 30	5.1	6.3	18.6	11.8	34	. .	380	. .	420	. .	32.1	10 33 49.4	. .	+ 10.4	61 40 21.0	− 1.2
33	22 22	2.8	1.8	15.8	7.8	34	330	. .	. .	. .	300	32.1	22 25 54.1	. .	+ 22.8	73 32 38.1	. .
34	22 22	2.8	1.8	15.8	7.8	33	. .	680	. .	585	. .	32.1	22 26 4.4	. .	+ 22.8	73 32 48.4	. .
35	26 6	8.3	5.4	19.7	10.5	31	030	980	. .	. .	. .	32.1	26 10 40.8	. .	+ 27.1	77 17 29.1	. .
36	26 38	2.1	1.9	15.8	5.8	32	. .	. .	. .	645	575	32.1	26 42 20.6	78.0	+ 27.8	77 49 9.6	. .
37	64 6	2.0	0.0	12.0	5.5	36	. .	175	. .	290	. .	34.0	64 9 28.5	72.8	+ 1 54.7	115 17 44.4	−15.5
38	26 10	9.5	7.7	17.0	14.2	33	. .	. .	. .	535	480	34.0	26 14 3.6	. .	+ 27.6	77 20 52.4	+ 2.5
39	14 14	5.8	5.0	17.5	9.0	30	. .	755	. .	785	. .	34.0	14 18 48.0	. .	+ 14.3	65 25 23.5	+ 2.8
40	1 34	5.5	5.2	16.5	9.4	35	. .	990	. .	040	. .	34.0	1 38 27.9	. .	+ 1.6	52 44 50.7	+ 5.6
41	347 20	6.3	5.0	16.0	10.2	35	. .	. .	. .	820	890	34.0	347 23 30.9	. .	− 12.5	38 29 39.6	+ 2.4
42	288 14	8.5	5.6	16.7	12.8	33	. .	. .	. .	685	. .	34.0	288 18 1.1	. .	− 2 47.6	339 21 34.7	+ 2.4
43	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
44	0 10	6.8	6.3	17.8	10.8	36	010	960	. .	965	060	34.0	0 13 27.1	. .	+ 0.2	51 19 48.5	+ 2.0
45	306 6	4.7	3.3	13.0	9.5	38	135	165	165	130	125	34.0	306 8 56.5	. .	− 1 16.7	357 14 1.0	+ 2.8
46	25 8	4.0	2.9	15.0	7.6	32	290	290	. .	340	365	34.0	25 12 26.1	. .	+ 26.4	76 19 13.7	+ 3.6
47	0 56	3.7	3.8	15.8	7.7	38	. .	. .	. .	600	650	34.0	0 58 49.8	. .	+ 1.0	52 5 12.0	+ 7.5
48	35 56	2.3	0.0	12.8	5.5	30	. .	430	. .	550	. .	34.0	36 0 56.3	. .	+ 40.8	87 7 58.3	+ 4.1
49	65 24	2.3	29.3	11.8	6.3	31	. .	805	. .	825	. .	34.0	65 26 3.2	. .	+ 2 2.4	116 34 26.8	− 2.6
50	65 24	2.3	29.3	11.8	6.3	36	. .	. .	. .	745	710	34.0	65 27 21.2	. .	+ 2 2.5	116 35 44.9	− 2.6

No.	Barom.	At. Ther.
	in.	°
4	29.95	77.0
7	29.99	70.6
12	29.98	69.6
19	29.99	68.6
22	29.89	74.8
23	29.90	75.5
25	29.91	79.3
29	30.06	73.5
36	30.05	77.4
37	30.06	74.7

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
25	− 3.8	− 15 50.6	. .	− 15 54.4
26	− 3.8	+ 15 50.6	. .	+ 15 46.8
33	− 2.0	+ 5.2	. .	+ 3.2
34	− 2.0	− 5.2	+ 0.1	− 7.1
35	− 3.8	+ 15 50.2	. .	+ 15 46.4
36	− 3.9	− 15 50.2	. .	− 15 54.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Aug. 20	1	γ Aquilæ. . . .	P.	58.3	0.8	2.5	8.7	10.7	12.9	18.9	20.7	23.3	41 10.76	− 0.39	−48.56	−48.53	19 40 21.84	+ 0.06
	2	α Aquilæ. . . .	P.	20.5	22.9	24.5	30.8	32 8	34.9	41.1	42.7	45.2	45 32.82	− 0.39	−48.52	−48.53	19 44 43.90	+ 0.03
	3	XIX, 16 . . .	P.	43.2	46.0	47.9	54.9	57.4	59.8	7.0	8.8	11.9	51 57.43	− 0.70	. .	−48.56	19 51 8.17	− 3.75
	4	B. A. C. 6879 . .	P.	34.9	37.4	39.3	. .	. .	. .	. .	. .	. .	56 48.52	− 0.22	. .	−48.56	19 55 59.74	− 2.61
	5	B. A. C. 6983 . .	P.	24.0	27.7	30.0	39.0	42.1	45.1	54.2	56.5	0.1	11 42.08	+ 0.06	. .	−48.57	20 10 53.57	− 2.49
	6	B. A. C. 7022 . .	P.	19.9	23.0	25.0	33.0	35.9	38.6	46.3	48.4	51.6	18 35.74	− 0.06	. .	−48.57	20 17 47.11	− 2.56
	7	B. A. C. 7077 . .	P.	5.0	7.8	9.5	16.2	18.4	20.9	27.6	29.4	32.5	26 18.59	− 0.65	. .	−48.58	20 25 29.36	− 3.65
	8	Anonymous . .	P.	21.4	23.9	25.6	30.0	34.5	39.2	43.8	45.5	48.2	26 34.68	− 0.65	. .	−48.58	20 25 45.45	− 3.66
	9	Anonymous . .	P.	0.5	3.2	5.1	11.6	13.9	16.1	22.9	24.7	27.6	28 13.96	− 0.65	. .	−48.58	20 27 24.73	− 3.66
	10	B. A. C. 7175 . .	P.	48.8	51.9	54.1	2.0	4.6	7.5	15.3	17.2	20.7	39 4.68	− 0.78	. .	−48.58	20 38 15.32	− 4.27
	11	B. A. C. 7280 . .	P.	15.8	18.8	20.7	28.0	30.4	32.9	40.1	41.9	45.1	54 30.41	− 0.71	. .	−48.59	20 53 41.11	− 3.97
	12	Mural Zones 187, 66	P.	31.1	33.7	35.4	42.0	44.2	46.4	52.9	54.6	57.3	7 44.18	− 0.61	. .	−48.59	21 6 54.98	− 3.56
	13	O. Arg. S. 21237 .	P.	30.8	33.6	35.2	41.5	43.8	46.0	52.6	54.2	56.9	8 43.84	− 0.61	. .	−48.59	21 7 54.64	− 3.56
	14	B. A. C. 7447 . .	P.	49.0	51.8	53.5	0.2	2.2	4.3	11.2	12.6	15.5	21 2.26	− 0.62	. .	−48.60	21 20 13.04	− 3.60
	15	B. A. C. 7475 . .	P.	19.2	22.2	24.2	31.6	34.0	36.5	44.0	46.0	48.9	25 34.07	− 0.73	. .	−48.60	21 24 44.74	− 4.06
	16	B. A. C. 7502 . .	P.	56.7	59.7	1.8	9.0	11.5	14.0	21.2	23.0	26.2	30 11.46	− 0.72	. .	−48.60	21 29 22.14	− 4.02
	17	Saturn I, N. . .	P.	16.8	19.6	21.1	. .	. .	. .	38.0	39.7	42.3	41 29.58	− 0.57	. .	−48.61	21 40 40.40	. .
	18	Saturn II, S. . .	P.	. .	. .	26.4	28.8	30.8	33.0	35.1	. .	. .	41 30.82	− 0.57	. .	−48.61	21 40 41.64	. .
	19	B. A. C. 7647 . .	P.	22.0	25.2	27.2	35.2	37.7	40.3	48.2	50.1	53.7	52 37.73	− 0.78	. .	−48.61	21 51 48.34	− 4.25
	20	Anonymous . .	P.	25.4	28.2	29.9	36.1	38.4	40.5	46.9	48.4	51.3	0 38.34	− 0.59	. .	−48.61	21 59 49.14	− 3.46
	21	Anonymous . .	P.	58.4	1.0	2.5	9.0	11.1	13.2	19.9	21.4	24.2	2 11.19	− 0.59	. .	−48.61	22 1 21.99	− 3.46
	22	ζ Pegasi	P.	53.2	55.7	57.3	3.5	5.6	7.7	14.0	15.5	18.0	36 5.61	− 0.38	−48.60	−48.61	22 35 16.62	− 0.05
	23	B. A. C. 7944 . .	P.	18.2	21.5	23.5	31.2	34.0	36.3	44.6	46.3	49.9	41 33.94	− 0.77	. .	−48.63	22 40 44.54	− 4.11
	24	α Piscis Australis .	P.	23.2	25.9	27.7	35.1	37.3	39.7	46.7	48.5	51.6	51 37.30	− 0.69	−48.44	−48.62	22 50 47.99	− 0.14
	25	α Pegasi	P.	11.3	13.8	15.6	21.8	23.9	26.1	32.3	33.9	36.7	59 23.93	− 0.34	−48.58	−48.62	22 58 34.97	− 0.01
	26	ι Piscium . . .	P.	11.0	13.5	15.2	21.2	23.2	25.3	31.5	33.0	35.6	34 23.28	− 0.42	−48.61	−48.64	23 33 34.22	− 0.03
	27	Anonymous . .	P.	53.5	56.1	57.7	3.6	5.8	7.9	14.0	15.6	18.2	42 5.82	− 0.50	. .	−48.65	23 41 16.67	− 3.01
	28	Weisse 848 . .	P.	59.9	2.3	4.2	10.2	12.2	14.2	20.5	22.0	24.4	43 12.21	− 0.50	. .	−48.66	23 42 23.05	− 3.01
	29	B. A. C. 8309 . .	P.	41.9	45.2	47.1	55.6	58.2	1.1	9.1	11.2	15.0	48 58.27	− 0.80	. .	−48.66	23 48 8.81	− 3.85
	30	B. A. C. 8357 . .	P.	39.0	42.4	44.4	51.9	54.6	57.2	4.7	6.4	9.9	57 54.50	− 0.75	. .	−48.66	23 57 5.09	− 3.64
	31	B. A. C. 69 . .	P.	17.8	21.1	22.9	30.9	33.9	36.4	44.2	46.2	49.7	15 33.68	− 0.78	. .	−48.66	0 14 44.24	− 3.62
	32	B. A. C. 104 . .	P.	53.2	56.8	58.8	6.6	9.3	12.1	20.3	22.0	25.9	23 9.44	− 0.79	. .	−48.67	0 22 19.98	− 3.59
	33	B. A. C. 118 . .	P.	58.2	1.5	3.4	11.4	14.2	16.8	24.9	26.8	30.2	25 14.16	− 0.78	. .	−48.67	0 24 24.71	− 3.56
	34	B. A. C. 192 . .	P.	19.1	22.2	24.1	32.1	34.6	37.2	45.2	47.2	50.4	37 34.68	− 0.78	. .	−48.67	0 36 45.23	− 3.42
	35	B. A. C. 202 . .	P.	46.2	49.2	51.5	59.3	2.1	4.8	12.6	14.4	17.9	39 2.00	− 0.78	. .	−48.67	0 38 12.55	− 3.41
	36	32^1 Camelopard., S. P.	P.	. .	. .	36.0	17.2	56.7	37.9	17.0	. .	. .	48 56.96	− 5.93	. .	−48.67	12 48 2.36	+ 2.54
	37	32^2 Camelopard., S. P.	P.	. .	. .	45.0	24.6	5.0	44.9	24.0	. .	. .	49 4.70	− 5.93	. .	−48.67	12 48 10.10	− 1.14
	38	Lalande 1799 . .	P.	33.7	36.3	37.8	43.9	46.0	48.0	54.1	55.7	58.4	56 45.99	− 0.42	. .	−48.68	0 55 56.89	− 2.66
	39	Weisse 982 . .	P.	52.5	55.0	56.7	2.7	4.9	6.9	13.0	14.4	17.2	58 4.81	− 0.42	. .	−48.68	0 57 15.71	− 2.65
	40	Polaris	P.	. .	. .	50.0	18.0	45.5	9.0	39.0	. .	. .	13 44.30	+22.69	. .	−48.68	1 13 18.31	− 2.26
	41	Moon II . . .	P.	4.5	7.2	8.8	15.2	17.3	19.4	25.8	27.4	30.0	22 17.29	− 0.39	. .	−48.69	1 21 28.21	−67.61
	42	ο Piscium . . .	P.	26.8	29.3	30.9	36.9	39.0	41.2	47.3	49.0	51.6	39 39.11	− 0.39	−48.56	−48.70	1 38 50.02	− 0.17
	43	β Arietis	P.	22.8	25.3	26.9	33.4	35.5	37.9	44.6	46.0	48.6	48 35.67	− 0.29	−48.69	−48.70	1 47 46.68	+ 0.01
	44	50 Cassiopeæ . . .	P.	0.1	7.9	12.7	32.3	38.4	45.2	4.9	9.9	18.0	53 38.82	+ 1.11	. .	−48.71	1 52 51.22	+ 0.13
21	45	σ Scorpii	P.	14.1	16.9	18.5	25.3	27.6	29.9	36.6	38.3	41.2	14 27.60	− 0.71	. .	−48.97	16 13 37.92	− 2.22
	46	B. A. C. 5629 . .	P.	. .	8.5	12.1	15.7	19.4	23.0	30.3	33.0	37.6	41 15.71	+ 0.23	. .	−49.00	16 40 26.94	− 1.59
	47	B. A. C. 5793 . .	P.	29.2	32.3	34.0	41.2	43.8	46.2	53.4	55.1	58.2	5 43.71	− 0.77	. .	−49.00	17 4 53.94	− 2.76
	48	Anonymous . .	P.	9.8	12.5	14.3	21.0	23.2	25.4	32.2	33.9	36.7	15 23.22	− 0.70	. .	−49.00	17 14 33.52	− 2.66
	49	XVII, 3 . . .	P.	46.5	49.2	51.0	57.5	59.7	1.9	8.6	10.2	13.1	16 59.74	− 0.68	. .	−49.00	17 16 10.06	− 2.64

20, 28. Wire B used.
34. Wire A used.
36, 37. Bisections at set C.
48. Telescope micrometer reading decreased one revolution in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	28 30	10 5.6	4.0	15.5	10.1	32	. .	025	. .	040	. .	34.0	28 34 29.1	. .	+ 30.6	79 41 20.9	+ 3.2
2	30 16	4.0	3.2	14.3	7.2	31	. .	340	. .	385	. .	34.0	30 20 40.9	. .	+ 33.0	81 27 35.1	+ 4.0
3	69 40	7.3	2.7	14.2	10.5	36	. .	160	. .	080	. .	34.0	69 43 26.3	. .	+ 2 31.1	120 52 18.6	− 1.3
4	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
5	351 30	5.5	5.5	16.3	10.5	33	875	875	. .	925	895	34.0	351 34 0.4	. .	− 8.4	42 40 13.2	+ 8.8
6	358 58	3.3	3.3	14.5	6.7	33	. .	. .	. .	. .	720	34.0	359 2 6.0	. .	− 0.9	50 8 26.3	+ 8.8
7	64 12	6.0	4.3	17.0	11.0	33	600	602	. .	. .	. .	34.0	64 13 30.6	. .	+ 1 56.2	115 21 48.0	+ 3.2
8	64 12	6.0	4.3	17.0	11.0	32	. .	. .	. .	295	220	34.0	64 16 24.8	. .	+ 1 56.5	115 24 42.5	+ 3.2
9	64 12	6.0	4.3	17.0	11.0	29	. .	. .	. .	320	. .	34.0	64 17 9.9	. .	+ 1 56.5	115 25 27.6	+ 3.4
10	78 24	4.0	1.7	11.5	7.6	33	. .	340	. .	390	. .	34.0	78 28 10.9	. .	+ 4 29.0	129 39 1.1	+ 2.5
11	71 32	5.7	3.0	14.5	9.2	36	. .	010	. .	190	. .	34.0	71 35 27.2	. .	+ 2 47.8	122 44 36.2	+ 5.1
12	59 24	2.5	0.5	14.5	7.4	33	770	760	. .	. .	. .	34.0	59 28 4.5	. .	+ 1 35.4	110 36 1.1	+ 7.8
13	59 24	2.5	0.5	14.5	7.4	37	. .	425	. .	435	. .	34.0	59 27 8.8	. .	+ 1 35.4	110 35 5.4	+ 7.9
14	60 32	8.2	5.5	19.5	12.9	33	810	855	. .	. .	. .	34.0	60 35 58.2	. .	+ 1 39.9	111 43 59.3	+ 9.0
15	73 16	3.3	0.5	13.0	7.6	33	875	900	. .	. .	. .	34.0	73 20 2.6	. .	+ 3 6.4	124 29 30.2	+ 8.4
16	72 24	4.2	0.5	13.0	8.2	38	. .	270	. .	325	. .	34.0	72 26 55.2	. .	+ 2 56.6	123 36 13.0	+ 9.0
17	54 12	5.3	4.6	17.3	10.5	32	725	. .	. .	. .	765	34.0	54 16 17.3	. .	+ 1 18.5	105 23 57.0	. .
18	54 12	5.3	4.6	17.3	10.5	31	. .	665	. .	675	. .	34.0	54 16 33.8	. .	+ 1 18.5	105 24 13.5	. .
19	77 44	4.6	1.7	11.3	8.0	31	. .	525	. .	405	. .	34.0	77 48 39.8	. .	+ 4 15.7	128 59 16.7	+11.1
20	56 6	4.3	3.0	15.5	8.8	33	. .	415	. .	385	. .	34.0	56 7 36.0	. .	+ 1 24.1	107 15 21.3	+12.8
21	56 6	4.3	3.0	15.5	8.8	33	. .	950	. .	990	. .	34.0	56 10 0.1	65.8	+ 1 24.3	107 17 45.6	+12.9
22	28 38	2.0	0.2	11.8	5.3	33	. .	580	. .	555	. .	34.0	28 42 9.5	. .	+ 31.0	79 49 1.7	+ 2.4
23	77 38	3.0	0.5	11.0	6.6	34	. .	640	. .	730	. .	34.0	77 41 51.6	. .	+ 4 13.6	128 52 26.4	+16.6
24	69 4	2.6	0.5	11.5	6.5	34	. .	260	. .	320	. .	34.0	69 7 57.8	. .	+ 2 27.5	120 16 46.5	+ 1.6
25	24 18	6.0	4.5	17.2	10.5	37	. .	750	. .	735	. .	34.0	24 21 0.9	. .	+ 25.7	75 27 47.8	+ 2.3
26	33 52	6.2	4.2	16.5	10.3	34	. .	625	. .	625	. .	34.0	33 55 48.8	65.0	+ 38.2	85 2 48.2	+ 1.8
27	44 0	5.5	4.0	16.7	10.0	32	. .	422	. .	420	. .	34.0	44 1 49.9	. .	+ 54.8	95 9 5.9	+18.9
28	44 0	5.5	4.0	16.7	10.0	38	. .	645	. .	590	. .	34.0	44 0 15.0	. .	+ 54.8	95 7 31.0	+18.9
29	79 44	4.8	1.0	12.0	7.1	33	. .	840	. .	995	. .	34.0	79 48 2.4	. .	+ 5 4.7	130 59 28.3	+23.3
30	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
31	78 40	7.2	4.0	13.8	10.0	31	. .	610	. .	735	. .	34.0	78 44 34.3	. .	+ 4 37.2	129 55 32.7	+25.4
32	79 20	6.0	3.3	13.4	9.5	31	. .	300	. .	345	. .	34.0	79 24 40.4	. .	+ 4 54.2	130 35 55.8	+26.1
33	78 56	4.0	0.8	11.6	7.0	30	. .	310	. .	460	. .	34.0	79 0 56.9	. .	+ 4 44.1	130 12 2.2	+26.2
34	77 52	8.0	5.2	14.8	11.6	36	. .	775	. .	795	. .	34.0	77 57 47.8	. .	+ 4 19.9	129 8 28.9	+27.0
35	77 52	8.0	5.2	14.8	11.6	35	. .	685	. .	700	. .	34.0	77 55 31.6	. .	+ 4 19.0	129 6 11.8	+27.1
36	302 56	4.3	3.5	13.0	9.3	30	030	. .	. .	. .	045	34.0	303 1 0.7	. .	− 1 27.3	354 5 54.6	+ 1.0
37	302 56	4.3	3.5	13.0	9.3	31	110	. .	. .	. .	. .	34.0	303 0 44.3	. .	− 1 27.3	354 5 38.2	+ 6.2
38	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
39	34 16	0.8	28.5	10.5	4.8	38	. .	. .	. .	790	793	34.0	34 18 51.0	. .	+ 38.8	85 25 51.0	+19.6
40	310 12	4.0	3.0	13.8	9.5	33	040	035	030	045	020	34.0	310 16 15.1	. .	− 1 7.1	1 21 29.2	+ 2.1
41	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
42	30 18	2.6	1.3	13.8	7.0	37	. .	485	. .	440	. .	34.0	30 21 8.5	. .	+ 33.3	81 28 3.0	+ 2.5
43	18 38	0.2	0.8	14.0	4.7	36	. .	720	. .	765	. .	34.0	18 41 20.9	63.3	+ 19.3	69 48 1.4	+ 3.9
44	327 2	6.5	7.0	17.4	12.5	36	. .	280	. .	235	. .	34.0	327 5 23.2	. .	− 36.9	18 11 7.5	+ 1.1
45	64 6	1.0	29.0	11.2	5.2	36	. .	285	. .	295	. .	31.8	64 9 26.2	. .	+ 1 54.8	115 11 42.2	−15.5
46	342 54	1.5	1.2	11.0	6.0	31	. .	. .	. .	720	770	31.8	342 58 36.2	. .	− 17.1	34 4 40.3	+ 6.6
47	71 4	2.4	0.8	11.0	5.9	32	. .	760	. .	890	. .	31.8	71 8 18.3	. .	+ 2 42.4	122 17 21.9	−15.6
48	62 14	4.4	1.8	13.4	7.6	31	. .	160	. . .	250	. .	31.8	62 18 56.7	. .	+ 1 46.4	113 27 4.3	−12.1
49	60 24	2.3	29.8	12.8	6.5	34	. .	. .	. .	770	772	31.8	60 27 48.5	. .	+ 1 38.6	111 35 48.3	−11.4

No.	Barom.	At. Ther.
	in.	°
21	30.09	66.6
26	30.11	66.4
43	30.12	65.3

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
17	− 0.8	+ 8.3	.	+ 7.5
18	− 0.8	− 8.2	.	− 9.0

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s	s.	h. m. s.	s.
1875. Aug. 21	1	XVII, 8 . . .	P.	26.4	29.0	30.9	37.6	39.7	42.0	48.7	50.3	53.2	24 39.76	− 0.70	. .	−49.01	17 23 50.05	− 2.73
	2	B. A. C. 5929 . .	P.	5.1	8.3	10.4	18.3	20.8	23.5	31.3	33.3	36.5	27 20.83	− 0.13	. .	−49.01	17 26 31.69	− 1.98
	3	B. A. C. 5950 . .	P.	. .	26.5	30.0	33.2	37.1	40.8	47.9	50.6	55.0	30 33.53	+ 0.20	. .	−49.00	17 29 44.72	− 1.80
	4	B. A. C. 5951 . .	P.	. .	31.8	35.2	38.4	42.4	46.1	53.3	56.0	0.5	30 38.84	+ 0.20	. .	−49.00	17 29 50.03	− 1.80
	5	O. Arg. S. 17123 .	P.	2.5	5.3	7.1	14.0	16.2	18.7	25.5	27.2	30.4	37 16.32	− 0.72	. .	−49.02	17 36 26.58	− 2.89
	6	Transit Zones 36, 67	P.	55.6	58.5	0.3	7.2	9.4	11.8	18.8	20.5	23.6	38 9.52	− 0.72	. .	−49.02	17 37 19.78	− 2.90
	7	O. Arg. S. 17177 .	P.	19.4	22.2	24.2	30.7	33.0	35.3	42.2	43.9	46.7	39 33.07	− 0.72	. .	−49.02	17 38 43.33	− 2.91
	8	Mars I, N. . . .	P.	44.3	47.0	48.8	. .	. .	. .	7.2	8.9	11.8	43 58.00	− 0.73	. .	−49.02	17 43 8.25	+ 0.70
	9	Mars II, S. . .	P.	. .	. .	54.6	56.9	59.4	1.5	3.8	. .	. .	43 59.24	− 0.73	. .	−49.02	17 43 9.49	− 0.54
	10	γ^2 Sagittarii . . .	P.	25.3	28.2	30.1	37.0	39.4	41.9	49.0	50.7	53.8	58 39.49	− 0.75	−48.89	−49.04	17 57 49.70	− 0.14
	11	δ Ursæ Minoris. .	P.	53.5	36.5	2.5	10.0	46.0	20.5	. .	. .	. .	13 20.26	+ 8.77	. .	−49.05	18 12 39.98	− 0.23
	12	η Serpentis . . .	P.	30.5	33.1	34.6	40.7	42.7	44.7	51.0	52.4	55.1	15 42.76	− 0.54	−49.08	−49.05	18 14 53.17	+ 0.09
	13	α Lyræ	P.	18.1	21.5	23.4	31.3	34.0	36.6	44.3	46.3	49.4	33 33.88	− 0.13	−49.12	−49.06	18 32 44.69	+ 0.08
	14	51 Cephei, S. P. . .	P.	. .	. .	41.5	0.5	16.0	35.0	52.5	. .	. .	42 17.10	−12.18	. .	−49.07	6 41 15.85	− 0.37
	15	β Lyræ	P.	4.9	8.1	9.7	17.1	19.4	22.0	29.3	31.0	34.2	46 19.52	− 0.20	−49.08	−49.07	18 45 30.25	+ 0.04
	16	XIX, 10 . . .	P.	13.9	16.8	18.6	26.0	28.3	30.9	38.3	40.0	43.0	32 28.42	− 0.77	. .	−49.07	19 31 38.58	− 3.74
	17	B. A. C. 6762 . .	P.	27.2	29.8	31.5	38.3	40.4	43.0	49.8	51.6	54.4	39 40.67	− 0.28	. .	−49.07	19 38 51.32	− 2.57
	18	B. A. C. 6806 . .	P.	38.3	41.4	43.5	51.3	53.9	56.5	4.6	6.3	9.6	45 53.93	− 0.14	. .	−49.08	19 45 4.71	− 2.47
	19	λ Ursæ Minoris. .	P.	. .	. .	. .	. .	45.0	37.0	24.0	. .	. .	49 45.35	+29.32	. .	−49.08	19 49 25.59	− 0.91
	20	B. A. C. 6879 . .	P.	35.6	38.2	40.0	46.8	49.3	51.7	58.5	0.2	3.0	56 49.26	− 0.27	. .	−49.09	19 55 59.90	− 2.60
	21	B. A. C. 6934 . .	P.	31.8	34.3	35.8	41.9	44.0	46.0	52.2	53.7	56.3	5 44.00	− 0.53	. .	−49.09	20 4 54.38	− 3.02
	22	B. A. C. 6948 . .	P.	44.0	47.0	48.6	55.8	58.1	0.4	7.7	9.4	12.4	8 58.16	− 0.75	. .	−49.09	20 8 8.32	− 3.78
	23	B. A. C. 6990 . .	P.	47.2	50.6	52.4	0.0	2.7	5.2	13.1	15.0	18.2	14 2.71	− 0.15	. .	−49.09	20 13 13.47	− 2.55
	24	B. A. C. 7077 . .	P.	5.7	8.4	10.2	14.6	16.9	19.3	21.5	23.7	. .	26 19.20	− 0.71	. .	−49.10	20 25 29.39	− 3.65
	25	Anonymous . .	P.	22.0	24.6	26.3	33.0	35.3	37.6	44.3	46.1	48.8	26 35.33	− 0.71	. .	−49.10	20 25 45.52	− 3.66
	26	Anonymous . .	P.	25.6	28.5	30.6	36.8	39.0	41.4	47.9	49.9	52.6	27 39.14	− 0.71	. .	−49.10	20 26 49.33	− 3.66
	27	Anonymous . .	P.	1.0	4.0	5.7	12.3	14.5	16.9	23.6	25.4	28.3	28 14.63	− 0.71	. .	−49.10	20 27 24.82	− 3.66
	28	B. A. C. 7213 . .	P.	9.4	12.5	14.2	22.0	24.3	26.8	34.5	36.4	39.8	43 24.43	− 0.17	. .	−49.11	20 42 35.15	− 2.63
	29	XX, 16	P.	. .	. .	. .	58.7	0.9	3.4	8.0	9.7	12.5	44 58.66	− 0.73	. .	−49.11	20 44 8.82	− 3.79
	30	β Aquarii . . .	P.	39.3	41.8	43.5	49.6	51.7	53.7	59.8	1.4	3.9	25 51.63	− 0.56	−49.16	−49.14	21 25 1.93	+ 0.05
	31	ε Pegasi	P.	42.8	45.6	47.2	53.2	55.3	57.4	3.8	5.2	7.8	38 55.37	− 0.44	−49.12	−49.15	21 38 5.78	− 0.02
	32	Saturn I, N. . .	P.	0.2	2.7	4.3	. .	. .	. .	21.3	23.0	25.6	41 12.85	− 0.63	. .	−49.14	21 40 23.08	. .
	33	Saturn II, S. . .	P.	. .	. .	9.8	11.9	14.2	16.3	18.4	. .	. .	41 14.12	− 0.63	. .	−49.14	21 40 24.35	. .
	34	B. A. C. 7635 . .	P.	7.5	10.9	12.9	20.8	23.5	26.1	33.9	35.7	39.1	50 23.38	− 0.83	. .	−49.15	21 49 33.40	− 4.23
	35	α Aquarii . . .	P.	2.4	4.9	6.4	12.6	14.6	16.8	22.9	24.3	26.9	0 14.64	− 0.52	−49.18	−49.16	21 59 24.96	+ 0.05
	36	B. A. C. 7742 . .	P.	29.0	31.6	33.3	39.4	41.6	43.7	50.2	51.7	54.4	6 41.66	− 0.39	. .	−49.15	22 5 52.12	− 2.91
	37	Tran. Zones 205, 40	P.	18.0	20.6	22.1	28.5	30.7	32.9	39.2	40.7	43.3	17 30.67	− 0.63	. .	−49.15	22 16 40.89	− 3.41
	38	Tran. Zones 204, 17	P.	57.3	59.9	1.5	8.0	10.0	12.0	18.7	20.2	22.8	20 10.04	− 0.63	. .	−49.15	22 19 20.26	− 3.41
	39	B. A. C. 7842 . .	P.	. .	. .	12.8	15.1	17.4	20.0	22.6	. .	. .	25 17.58	− 0.78	. .	−49.15	22 24 27.65	− 3.92
	40	Weisse 604 . .	P.	49.1	51.8	53.4	57.6	59.8	1.8	4.0	5.9	. .	31 1.79	− 0.61	. .	−49.16	22 30 12.02	− 3.34
	41	B. A. C. 7923 . .	P.	46.8	49.8	51.5	58.6	0.9	3.2	10.2	12.0	14.9	38 0.88	− 0.25	. .	−49.16	22 37 11.47	− 2.79
	42	B. A. C. 7980 . .	P.	41.4	44.0	45.6	51.9	54.1	56.3	2.6	4.2	6.9	48 54.11	− 0.64	. .	−49.17	22 48 4.30	− 3.38
	43	B. A. C. 8032 . .	P.	21.4	24.3	26.0	32.9	35.3	37.6	44.4	46.0	49.0	58 35.21	− 0.27	. .	−49.18	22 57 45.76	− 2.80
	44	θ Piscium . . .	P.	18.0	20.6	22.1	28.2	30.3	32.3	38.6	40.0	42.7	22 30.31	− 0.47	−49.23	−49.23	23 21 40.61	+ 0.06
	45	Anonymous . .	P.	54.3	56.8	58.3	4.5	6.6	8.7	15.0	16.4	19.0	42 6.62	− 0.56	. .	−49.20	23 41 16.86	− 3.03
	46	Weisse 848 . .	P.	0.7	3.2	4.7	10.6	12.8	15.1	21.3	22.7	25.4	43 12.98	− 0.56	. .	−49.20	23 42 23.22	− 3.03
	47	Weisse 1114 . .	P.	5.7	8.2	10.0	15.7	17.8	20.0	26.1	27.6	30.2	56 17.92	− 0.54	. .	−49.21	23 55 28.17	− 2.97
	48	Polaris	P.	13.0	5.0	56.0	18.0	50.0	13.0	40.0	35.0	26.0	13 48.34	+22.69	. .	−49.25	1 13 21.78	+ 0.43
	49	ο Piscium . . .	P.	27.5	30.1	31.7	37.8	39.9	42.0	48.2	49.7	52.4	39 39.92	− 0.45	−49.28	−49.26	1 38 50.21	− 0.01

16, 24, 39, 45, 46, 47. Wire B used.
26. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	62 40	10 4.8	2.0	14.6	8.3	34	. .	345	. .	380	. .	31.8	62 43 52.4	. .	+ 1 48.3	113 52 1.9	−11.8
2	359 50	2.8	3.2	14.7	7.0	30	. .	120	. .	160	. .	31.8	359 54 58.0	. .	— 0.1	51 1 19.1	+ 5.4
3	343 34	4.2	2.0	12.5	7.8	35	. .	. .	. .	. .	625	31.8	343 37 35.4	. .	— 16.5	34 43 40.1	+ 7.4
4	343 34	4.2	2.0	12.5	7.8	32	. .	. .	. .	. .	990	31.8	343 38 15.8	. .	— 16.5	34 44 20.5	+ 7.4
5	66 12	7.2	3.5	15.6	10.2	35	. .	250	. .	. .	. .	31.8	66 15 36.8	. .	+ 2 6.9	117 24 4.9	−12.1
6	66 12	7.2	3.5	15.6	10.2	34	. .	000	. .	. .	. .	31.8	66 15 56.0	. .	+ 2 7.0	117 24 24.2	−12.0
7	66 12	7.2	3.5	15.6	10.2	38	. .	040	. .	150	. .	31.8	66 14 53.5	. .	+ 2 6.9	117 23 21.6	−11.9
8	66 24	5.1	3.3	15.4	10.0	33	590	. .	. .	. .	640	31.8	66 28 2.6	. .	+ 2 8.2	117 36 32.0	. .
9	66 24	5.1	3.3	15.4	10.0	32	. .	460	. .	495	. .	31.8	66 28 20.2	. .	+ 2 8.2	117 36 49.6	. .
10	69 12	12.0	8.5	20.0	15.8	30	. .	. .	. .	425	. .	31.8	69 16 46.0	. .	+ 2 27.4	120 25 34.6	— 0.8
11	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
12	41 44	2.6	29.2	11.8	4.5	31	. .	540	. .	590	. .	31.8	41 48 38.2	. .	+ 50.3	92 55 49.7	+ 2.4
13	0 10	5.2	5.8	18.2	10.8	35	920	910	. .	940	955	31.8	0 13 26.4	. .	+ 0.2	51 19 47.8	+ 1.5
14	306 6	1.8	1.2	10.2	7.6	38	135	200	150	205	200	31,8	306 8 56.2	. .	— 1 17.0	357 14 0.4	+ 2.5
15	5 36	4.6	4.4	15.0	8.6	32	. .	535	. .	545	. .	31.8	5 40 19.9	69.5	+ 5.6	56 46 46.7	+ 1.0
16	71 34	4.7	2.7	12.6	7.6	31	. .	000	. .	990	. .	31.8	71 35 11.6	. .	+ 2 48.1	122 45 20.9	— 3.7
17	12 0	4.5	4.0	16.0	10.5	37	. .	400	. .	430	. .	31.8	12 3 4.6	. .	+ 12.1	63 9 37.9	+ 7.4
18	0 26	2.6	2.3	12.6	5.7	35	. .	010	. .	095	. .	31.8	0 29 43.9	. .	+ 0.5	51 36 5.6	+ 8.4
19	309 54	1.5	1.2	9.8	6.8	30	. .	. .	820	835	880	31.8	309 58 49.2	. .	— 1 7.4	1 4 3.0	+ 0.6
20	11 26	2.4	1.1	13.3	6.5	38	. .	780	. .	820	. .	31.8	11 28 46.4	. .	+ 11.5	62 35 19.1	+ 8.0
21	40 0	3.5	0.6	12.0	7.2	33	. .	040	. .	135	. .	31.8	40 4 13.6	. .	+ 47.6	91 11 22.4	+ 5.1
22	69 10	7.2	3.5	14.8	10.5	32	. .	820	. .	850	. .	31.8	69 14 14.2	. .	+ 2 28.1	120 23 3.5	+ 0.5
23	1 12	8.6	7.0	17.8	11.2	38	. .	505	. .	490	. .	31.8	1 14 45.8	. .	+ 1.2	52 21 8.2	+ 9.0
24	64 12	4.2	0.2	13.5	8.3	33	. .	710	. .	. .	. .	31.8	64 13 30.0	. .	+ 1 56.8	115 21 48.0	+ 3.1
25	64 12	4.2	0.2	13.5	8.3	32	. .	. .	. .	350	. .	31.8	64 16 24.3	. .	+ 1 57.0	115 24 42.5	+ 3.2
26	64 12	4.2	0.2	13.5	8.3	29	. .	. .	. .	910	. .	31.8	64 19 34.6	. .	+ 1 57.3	115 27 53.1	+ 3.2
27	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
28	2 48	2.4	1.5	13.7	6.7	35	850	845	. .	. .	. .	31.8	2 51 31.2	. .	+ 2.8	53 57 55.2	+ 9.5
29	67 16	3.3	0.0	11.9	7.0	37	. .	. .	. .	995	980	31.8	67 18 59.0	66.5	+ 2 14.8	118 27 35.0	+ 4.6
30	44 56	4.2	1.5	13.3	7.0	34	. .	900	. .	975	. .	31.8	44 59 44.6	. .	+ 56.7	96 7 2.5	+ 2.2
31	29 30	6.8	4.0	15.8	10.5	30	710	745	. .	. .	. .	31.8	29 34 46.1	. .	+ 32.2	80 41 39.5	+ 2.0
32	54 14	5.0	2.6	15.8	9.8	34	575	. .	. .	. .	620	31.8	54 17 47.9	. .	+ 1 18.8	105 25 27.9	. .
33	54 14	5.0	2.6	15.8	9.8	33	. .	425	. .	510	. .	31.8	54 18 5.3	. .	+ 1 18.9	105 25 45.4	. .
34	77 6	2.3	28.8	8.8	5.3	34	. .	720	. .	005	. .	31.8	77 9 48.2	. .	+ 4 3.7	128 20 13.1	+10.8
35	39 44	4.3	0.2	13.2	7.3	33	. .	010	. .	100	. .	31.8	39 48 13.7	. .	+ 47.3	90 55 22.2	+ 0.9
36	23 24	5.6	3.0	15.8	10.2	35	. .	665	. .	635	. .	31.8	23 27 31.7	. .	+ 24.6	74 34 17.5	+12.4
37	54 22	4.2	0.8	14.2	7.8	31	. .	300	. .	360	. .	31.8	54 26 39.6	. .	+ 1 19.3	105 34 20.1	+14.2
38	54 22	4.2	0.8	14.2	7.8	29	. .	025	. .	085	. .	31.8	54 27 14.4	. .	+ 1 19.4	105 34 55.0	+14.4
39	71 46	3.3	29.5	11.0	7.8	25	. .	062	. .	080	. .	31.8	71 49 43.8	. .	+ 2 51.2	122 58 56.2	+14.8
40	51 50	8.0	4.8	18.5	11.6	33	. .	955	. .	115	. .	31.8	51 53 54.2	. .	+ 1 12.4	103 1 27.8	+15.1
41	9 16	5.0	3.5	15.7	9.2	36	. .	860	. .	905	. .	31.8	9 19 13.2	. .	+ 9.3	60 25 43.7	+11.9
42	55 18	6.0	0.8	15.0	8.2	37	. .	265	. .	355	. .	31.8	55 21 7.2	. .	+ 1 22.1	106 28 50.5	+16.7
43	11 26	1.7	0.5	12.5	7.3	38	. .	025	. .	030	. .	31.8	11 28 58.5	. .	+ 11.5	62 35 31.2	+12.5
44	33 8	2.3	29.8	11.8	7.0	37	. .	060	. .	140	. .	31.8	33 11 12.8	. .	+ 37.2	84 18 11.2	+ 2.3
45	44 0	5.3	3.1	15.2	8.8	32	. .	398	. .	393	. .	31.8	44 1 49.1	. .	+ 55.0	95 9 5.3	+19.0
46	44 0	5.3	3.1	15.2	8.8	33	. .	. .	. .	572	. .	31.8	44 0 14.9	. .	+ 54.9	95 7 31.0	+19.0
47	42 34	5.8	3.2	15.6	10.0	32	. .	. .	. .	240	265	31.8	42 35 51.2	64.8	+ 52.3	93 43 4.7	+19.4
48	310 12	8.3	6.6	16.8	13.3	32	770	775	735	780	775	31.8	310 16 13.3	. .	— 1 7.1	1 21 27.4	+ 0.6
49	30 18	3.0	2.2	13.6	7.5	37	. .	360	. .	400	. .	31.8	30 21 7.2	. .	+ 33.3	81 28 1.7	+ 1.4

No.	Barom.	At. Ther.
	in.	°
15	30.19	71.6
29	30.20	68.6
47	30.18	66.8

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
8	— 13.5	+ 8.8	. .	— 4.7
9	— 13.5	— 8.8	. .	— 22.3
32	— 0.8	+ 8.7	. .	+ 7.9
33	— 0.8	— 8.8	. .	— 9.6

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Aug. 21	1	β Arietis	P.	23.3	26.0	27.7	34.2	36.2	38.5	44.9	46.7	49.2	48 36.30	− 0.35	−49.24	−49.26	1 47 46.69	0.00
	2	α Arietis	P.	46.6	49.3	51.0	57.6	59.8	2.0	8.6	10.3	13.0	0 59.80	− 0.32	−49.26	−49.27	2 0 10.21	0.00
	3	Moon II, N. . .	P.	0.1	2.9	4.4	11.0	13.2	15.4	21.8	23.6	26.2	16 13.18	− 0.39	. .	−49.27	2 15 23.52	−69.76
24	4	ι Ursæ Majoris. .	P.	13.0	16.9	19.2	28.4	31.4	34.6	43.7	46.2	50.0	51 31.49	+ 0.18	. .	−51.81	8 50 39.86	+ 0.28
25	5	Sun I, N. . . .	P.	44.6	47.0	48.6	54.9	57.0	59.0	5.3	6.9	9.6	15 56.99	− 0.47	. .	−51.86	10 15 4.66	. .
	6	Sun II, S. . . .	P.	53.6	56.5	58.0	4.3	6.3	8.4	14.7	16.2	18.9	18 6.32	− 0.47	. .	−51.86	10 17 13.99	. .
	7	η Ursæ Minoris . .	P.	. .	23.2	26.3	29.6	32.7	36.1	42.3	44.7	48.6	43 29.58	+ 0.22	. .	−51.99	13 42 37.81	− 0.03
	8	η Bootis	P.	24.6	27.3	29.0	35.4	37.7	40.1	46.0	47.9	50.6	49 37.62	− 0.37	−52.08	−52.00	13 48 45.25	+ 0.03
	9	α Bootis	P.	. .	. .	49.0	51.2	53.4	55.7	0.0	1.5	4.2	10 51.23	− 0.36	−52.03	−52.01	14 9 58.86	+ 0.04
	10	B. A. C. 5629 . .	P.	. .	. .	. .	. .	22.0	25.7	33.0	35.7	40.3	41 18.36	+ 0.31	. .	−52.10	16 40 26.57	− 1.44
	11	κ Ophiuchi . . .	P.	27.5	30.0	31.6	37.8	39.9	42.0	48.1	49.6	52.4	52 39.88	− 0.55	−52.17	−52.11	16 51 47.22	+ 0.10
	12	ε Ursæ Minoris. .	P.	25.7	36.7	7.3	22.2	37.3	52.9	7.5	37.8	48.5	59 37.32	+ 4.40	. .	−52.11	16 58 49.61	− 0.96
	13	a^1. Herculis . . .	P.	38.8	41.5	43.2	49.4	51.5	53.8	0.1	1.7	4.4	9 51.60	− 0.49	−52.13	−52.12	17 8 58.99	+ 0.03
	14	B. A. C. 5871 . .	P.	25.4	29.0	31.3	40.1	43.0	46.0	55.0	57.0	1.0	17 43.09	+ 0.02	. .	−52.11	17 16 51.00	− 1.76
	15	α Ophiuchi . . .	P.	50.0	52.9	54.3	0.6	2.7	4.9	11.0	12.6	15.3	30 2.70	− 0.52	−52.03	−52.13	17 29 10.05	− 0.07
	16	B. A. C. 5967 . .	P.	3.4	6.0	7.7	14.4	16.7	18.9	25.6	27.3	30.0	33 16.67	− 0.37	. .	−52.12	17 32 24.18	− 2.08
	17	μ Herculis . . .	P.	14.6	17.5	19.3	26.0	28.3	30.5	37.5	39.4	42.2	42 28.37	− 0.32	−51.97	−52.14	17 41 35.91	− 0.17
	18	B. A. C. 6033 . .	P.	26.0	28.8	30.5	37.3	39.6	41.9	48.7	50.1	53.3	44 39.58	− 0.35	. .	−52.12	17 43 47.11	− 2.12
	19	Mars I, N. . .	P.	8.8	11.8	13.4	. .	. .	. .	32.0	33.7	36.4	50 22.68	− 0.95	. .	−52.13	17 49 29.60	+ 0.60
	20	Mars II, S. . .	P.	. .	. .	19.2	21.4	23.7	26.0	28.4	. .	. .	50 23.74	− 0.95	. .	−52.13	17 49 30.66	− 0.46
	21	B. A. C. 6162 . .	P.	20.0	23.6	25.9	34.2	36.9	39.8	48.3	50.3	53.9	4 36.99	− 0.05	. .	−52.13	18 3 44.81	− 1.99
	22	Weisse (2) 395 .	P.	49.0	51.5	53.3	59.9	2.0	4.2	10.8	12.5	15.3	16 2.06	− 0.42	. .	−52.13	18 15 9.51	− 2.30
	23	Weisse (2) 415 .	P.	27.5	30.0	31.7	38.2	40.3	42.7	49.3	50.9	53.4	16 40.44	− 0.42	. .	−52.13	18 15 47.89	− 2.30
	24	Weisse (2) 475 .	P.	17.9	20.5	22.0	28.8	30.9	33.1	39.6	41.4	44.0	18 30.91	− 0.42	. .	−52.14	18 17 38.35	− 2.31
	25	B. A. C. 6350 . .	P.	40.6	44.6	47.3	57.2	0.6	3.9	13.7	16.3	20.5	32 0.52	+ 0.19	. .	−52.14	18 31 8.57	− 1.99
	26	B. A. C. 6365 . .	P.	37.0	40.1	42.1	50.0	52.4	55.0	2.8	4.7	8.0	36 52.46	− 0.16	. .	−52.14	18 36 0.16	− 2.18
	27	51 Cephei, S. P. . .	P.	. .	. .	51.0	10.0	. .	. .	. .	. .	. .	42 26.80	−15.22	. .	−52.18	6 41 19.40	+ 1.29
	28	B. A. C. 6438 . .	P.	37.8	40.6	42.3	48.7	51.2	53.3	59.8	1.4	4.3	47 51.04	− 0.41	. .	−52.15	18 46 58.48	− 2.42
	29	B. A. C. 6601 . .	P.	12.5	17.0	19.9	31.4	35.0	38.9	50.3	53.0	57.9	12 35.10	+ 0.37	. .	−52.15	19 11 43.32	− 2.11
	30	B. A. C. 6718 . .	P.	14.8	18.0	20.3	28.5	31.3	34.2	42.4	44.3	47.8	31 31.29	− 0.08	. .	−52.16	19 30 39.05	− 2.34
	31	B. A. C. 6724 . .	P.	. .	. .	. .	. .	. .	. .	41.7	43.3	45.9	32 33.20	− 0.47	. .	−52.16	19 31 40.57	− 2.64
	32	B. A. C. 6780 . .	P.	19.3	24.0	27.1	38.5	42.3	46.1	57.6	0.5	5.2	41 42.29	+ 0.39	. .	−52.17	19 40 50.51	− 2.24
	33	B. A. C. 6794 . .	P.	8.0	10.8	12.4	18.8	21.0	23.1	29.7	31.2	33.9	44 20.99	− 0.44	. .	−52.17	19 43 28.38	− 2.64
	34	B. A. C. 6827 . .	P.	50.7	53.4	55.1	1.9	4.1	6.3	13.0	14.7	17.4	49 4.07	− 0.38	. .	−52.17	19 48 11.52	− 2.59
	35	B. A. C. 6839 . .	P.	3.2	5.8	7.5	13.8	15.9	18.0	24.4	26.0	28.7	51 15.92	− 0.47	. .	−52.17	19 50 23.28	− 2.70
	36	B. A. C. 6882 . .	P.	8.6	11.3	13.0	19.8	22.0	24.3	31.0	32.7	35.5	57 22.02	− 0.37	. .	−52.17	19 56 29.48	− 2.61
	37	B. A. C. 6895 . .	P.	. .	. .	. .	. .	. .	50.2	56.5	58.7	2.8	58 43.78	+ 0.11	. .	−52.17	19 57 51.72	− 2.37
	38	B. A. C. 6986 . .	P.	7.3	10.6	12.5	20.6	23.3	26.0	33.7	35.9	39.1	13 23.22	− 0.12	. .	−52.18	20 12 30.92	− 2.50
	39	B. A. C. 7001 . .	P.	3.7	7.0	9.0	16.8	19.3	22.0	29.7	31.8	35.0	15 19.37	− 0.15	. .	−52.18	20 14 27.04	− 2.51
	40	B. A. C. 7077 . .	P.	9.0	11.9	13.4	18.0	20.4	22.7	24.8	27.2	. .	26 22.61	− 0.93	. .	−52.18	20 25 29.50	− 3.65
	41	Anonymous . .	P.	. .	34.3	36.4	38.7	40.9	43.2	47.8	49.3	52.3	26 38.70	− 0.93	. .	−52.18	20 25 45.59	− 3.65
	42	Anonymous . .	P.	29.0	32.0	33.6	40.3	42.5	44.8	51.6	53.2	56.2	27 42.58	− 0.93	. .	−52.18	20 26 49.47	− 3.65
	43	α Cygni	P.	47.8	51.3	53.5	2.1	4.9	7.8	16.4	18.7	22.4	38 4.99	− 0.02	−52.18	−52.25	20 37 12.72	− 0.05
	44	B. A. C. 7218 . .	P.	22.3	25.0	31.7	34.9	38.4	41.8	45.0	51.8	54.2	43 38.34	+ 0.20	. .	−52.18	20 42 46.35	− 2.51
	45	B. A. C. 7241 . .	P.	16.5	20.0	22.1	30.6	33.5	36.4	44.6	46.8	50.4	46 33.43	− 0.04	. .	−52.19	20 45 41.20	− 2.56
	46	B. A. C. 7316 . .	P.	11.0	14.0	15.7	22.9	25.2	27.5	34.6	36.4	39.3	59 25.18	− 0.99	. .	−52.19	20 58 32.00	− 3.90
	47	ζ Cygni	P.	18.2	21.1	22.8	30.0	32.3	34.7	41.5	43.3	46.4	8 32.26	− 0.30	−52.24	−52.26	21 7 39.70	− 0.01
	48	α Cephei	P.	9.2	12.5	21.3	25.6	30.0	34.3	38.4	37.6	50.6	16 29.94	+ 0.59	. .	−52.27	21 15 38.26	− 0.10
	49	1 Draconis, S. P. .	P.	31.1	12.0	2.2	32.7	3.3	49.8	34.3	5.5	. .	20 3.63	− 5.69	. .	−52.27	9 19 5.67	− 0.30
	50	β Aquarii. . . .	P.	42.6	45.0	46.6	52.7	54.9	57.0	3.0	4.5	7.2	25 54.83	− 0.72	−52.18	−52.28	21 25 1.83	− 0.07

3. Bisections at wires II–VI.
12. Bisections at set C.
24. Telescope micrometer reading increased one revolution in reduction.
40. Wire B used.
42. Wire A used.
49. Transits observed over wires B, C_1, C_3, C_4, C_6, and D_1

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	18 38	10 0.4	0.5	13.5	6.3	36	. .	605	. .	670	. .	31.8	18 41 20.0	. .	+ 19.3	69 48 0.5	+ 3.1
2	15 58	3.5	2.8	16.2	8.2	38	. .	060	. .	075	. .	31.8	16 0 55.7	. .	+ 16.4	67 7 33.3	+ 2.0
3	22 54	4.7	3.0	15.4	8.8	36	140	375	620	790	010	31.8	22 57 18.0	64.4	+ 24.1	74 4 3.3	. .
4	350 18	9 27.5	28.0	10.6	4.3	34	. .	195	. .	205	. .	29.6	350 21 58.0	. .	— 9.6	41 28 9.6	— 1.2
5	27 48	27.5	26.5	11.0	2.5	33	990	080	. .	. .	. .	29.6	27 52 1.1	. .	+ 29.8	78 58 52.1	. .
6	28 20	10 0.8	28.4	12.4	6.2	35	. .	. .	. .	135	145	29.6	28 23 41.4	71.8	+ 30.5	79 30 33.1	. .
7	348 54	9 28.6	27.2	9.6	4.2	35	. .	. .	. .	895	. .	29.6	348 57 32.6	. .	— 11.0	40 3 42.8	+ 0.5
8	19 48	28.6	28.0	12.6	4.3	34	. .	. .	. .	590	. .	29.6	19 51 51.0	. .	+ 20.4	70 58 32.6	+ 0.9
9	19 0	10 2.0	0.4	14.0	6.4	36	. .	430	. .	415	. .	29.6	19 3 20.6	. .	+ 19.5	70 10 1.3	+ 1.3
10	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . . .	71.0	. .	. . . . .	. .
11	29 14	9 28.8	26.7	8.5	3.0	30	. .	605	. .	670	. .	32.0	29 18 55.5	. .	+ 31.7	80 25 48.4	+ 3.0
12	316 36	10 0.5	29.8	11.0	6.8	33	775	. .	780	. .	810	32.0	316 40 4.5	. .	— 53.2	7 45 32.5	+ 2.4
13	24 18	2.5	0.0	13.0	6.8	37	. .	148	. .	150	. .	32.0	24 21 12.0	. .	+ 25.6	75 27 58.8	+ 3.5
14	352 28	2.5	1.4	13.1	7.3	34	. .	720	. .	680	. .	32.0	352 31 49.2	. .	— 7.4	43 38 3.0	+ 6.6
15	26 10	4.3	2.3	13.3	9.6	33	. .	645	. .	700	. .	32.0	26 14 3.4	. .	+ 27.9	77 20 52.5	+ 3.0
16	14 26	2.1	0.4	14.0	6.2	33	. .	122	. .	125	. .	32.0	14 30 13.6	. .	+ 14.6	65 36 49.4	+ 3.1
17	11 2	0.4	0.2	12.3	6.7	35	. .	060	. .	. .	. .	32.0	11 5 44.5	. .	+ 11.1	62 12 16.8	+ 4.2
18	13 10	3.5	2.7	14.7	8.9	36	035	020	. .	. .	. .	32 0	13 13 27.1	. .	+ 13.3	64 20 1.6	+ 3.8
19	66 20	0.3	27.7	11.3	5.7	35	860	. .	. .	. .	920	32.0	66 23 32.6	. .	+ 2 9.0	117 32 2.8	. .
20	66 20	0.3	27.7	11.3	5.7	34	. .	770	. .	860	. .	32.0	66 23 49.3	. .	+ 2 9.0	117 32 19.5	. .
21	355 22	0.2	29.2	11.4	5.7	30	. .	880	. .	880	. .	32.0	355 26 49.6	. .	— 4.5	46 33 6.3	+ 7.4
22	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
23	17 56	3.6	1.6	14.3	8.0	31	. .	. .	. .	575	565	32.0	18 0 36.5	. .	+ 18.5	69 7 16.2	+ 4.0
24	17 56	3.6	1.6	14.3	8.0	36	130	205	. .	. .	. .	32.0	17 59 10.2	. .	+ 18.5	69 5 49.9	+ 4.0
25	346 34	2.5	0.3	11.0	5.8	32	. .	. .	. .	330	. .	32.0	346 38 27.0	. .	— 13.5	37 44 34.7	+ 8.9
26	0 34	0.2	0.3	12.3	6.5	32	365	435	. .	. .	. .	32.0	0 38 25.4	. .	+ 0.6	51 44 47.2	+ 7.6
27	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
28	17 34	1.3	0.2	12.5	5.6	39	040	025	. .	. .	. .	32.0	17 36 43.6	65.4	+ 18.1	68 43 22.9	+ 5.3
29	341 20	1.0	29.6	10.0	6.5	32	490	420	. .	. .	. .	32.0	341 24 35.6	. .	— 19.2	32 30 27.6	+ 9.7
30	356 42	2.5	1.7	11.7	6.3	37	175	165	. .	. .	. .	32.0	356 45 11.7	. .	— 3.3	47 51 29.6	+ 9.3
31	22 38	1.5	29.6	12.0	5.7	33	. .	. .	. .	460	440	32.0	22 42 9.6	. .	+ 23.9	73 48 54.7	+ 6.4
32	341 8	9 29.8	29.5	9.8	5.5	39	265	200	. .	. .	. .	32.0	341 10 42.1	. .	— 19.5	32 16 43.8	+ 9.9
33	20 0	10 1.8	1.3	13.5	7.0	36	315	290	. .	. .	. .	32.0	20 3 24.4	. .	+ 20.9	71 10 6.5	+ 7.3
34	15 4	0.0	28.8	10.6	5.0	34	115	125	. .	. .	. .	32.0	15 8 0.2	. .	+ 15.5	66 14 36.9	+ 8.1
35	22 32	2.0	0.0	12.9	5.7	38	. .	540	. .	560	. .	32.0	22 34 51.0	. .	+ 23.8	73 41 36.0	+ 7.2
36	14 22	2.4	0.0	12.8	6.8	33	985	005	. .	. .	. .	32.0	14 26 0.2	. .	+ 14.7	65 32 36.1	+ 8.5
37	349 4	1.2	29.8	10.5	5.5	33	. .	. .	. .	220	250	32.0	349 8 14.1	. .	— 11.0	40 14 24.3	+10.1
38	358 52	0.6	0.7	12.2	6.4	38	870	890	. .	. .	. .	32.0	358 54 46.1	. .	— 1.1	50 1 6.2	+10.0
39	0 14	1.5	1.2	13.1	5.9	39	180	190	. .	. .	. .	32.0	0 16 41.0	. .	+ 0.3	51 23 2.5	+10.0
40	64 12	0.2	27.4	10.3	5.7	33	. .	980	. .	. .	. .	32.0	64 13 29.2	. .	+ 1 58.1	115 21 48.5	+ 2.9
41	64 12	0.2	27.4	10.3	5.7	32	. .	. .	. .	630	. .	32.0	64 16 23.4	. .	+ 1 58.4	115 24 43.0	+ 3.0
42	64 12	0.2	27.4	10.3	5.7	30	. .	. .	. .	240	. .	32.0	64 19 32.8	. .	+ 1 58.7	115 27 52.7	+ 3.1
43	354 0	0.6	29.8	11.0	5.8	36	010	012	. .	. .	. .	32.0	354 3 31.1	. .	— 6.0	45 9 46.3	+ 1.0
44	346 18	9 28.7	26.3	7.0	1.8	37	260	258	. .	. .	. .	32.0	346 21 15.2	. .	— 13.9	37 27 22.5	+10.4
45	355 14	29.2	29.0	10.5	5.5	33	335	330	. .	. .	. .	32.0	355 18 12.6	. .	— 4.7	46 24 29.1	+10.6
46	69 24	28.1	24.8	8.0	2.8	33	425	440	. .	. .	. .	32.0	69 28 12.8	. .	+ 2 32.2	120 37 6.2	+ 5.5
47	9 6	10 1.2	1.0	13.6	6.4	32	385	375	. .	. .	. .	32.0	9 10 24.9	. .	+ 9.3	60 16 55.4	+ 1.4
48	336 46	0.0	29.6	10.0	5.2	32	120	090	. .	. .	. .	32.0	336 50 31.7	. .	— 24.6	27 56 28.3	— 0.3
49	300 44	1.5	29.2	10.5	7.5	35	. .	. .	135	. .	. .	32.0	300 47 43.6	. .	— 1 36.2	351 52 28.6	+ 0.5
50	44 56	9 29.8	27.6	10.0	3.6	35	. .	. .	. .	225	. .	32.0	44 59 44.2	. .	+ 57.4	96 7 2.8	+ 2.7

No.	Barom.	At. Ther.
	in.	°
3	30.18	65.8
6	30.31	71.0
10	30.27	71.0
28	30.26	67.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
3	—22 51.2	+ 16 8.3	. .	— 6 42.9
5	— 4.1	+ 15 50.5	. .	+ 15 46.4
6	— 4.1	— 15 50.5	. .	— 15 54.6
19	— 13.0	+ 8.3	. .	— 4.7
20	— 13.0	— 8.4	. .	— 21.4

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Aug. 25	1	Saturn I, N.	P.	54.3	56.9	58.6	. .	. .	. .	15.6	17.2	19.9	40 7.08	− 0.82	. .	−52.21	21 39 14.05	. .
	2	Saturn II, S.	P.	. .	. .	4.0	6.0	8.2	10.3	12.5	. .	. .	40 8.20	− 0.82	. .	−52.21	21 39 15.17	. .
	3	Anonymous	P.	29.6	32.2	33.8	40.3	42.5	44.4	50.9	52.5	55.2	0 42.38	− 0.84	. .	−52.21	21 59 49.33	− 3.50
	4	Anonymous	P.	2.4	5.0	6.6	11.0	15.1	19.4	23.9	25.4	28.2	2 15.22	− 0.84	. .	−52.21	22 1 22.17	− 3.50
	5	B. A. C. 7749	P.	2.9	7.7	10.6	22.0	25.8	29.5	41.1	43.9	48.7	7 25.80	+ 0.38	. .	−52.21	22 6 33.97	− 2.78
	6	Weisse (2) 628.	P.	10.9	13.6	15.2	21.7	23.9	26.0	32.4	34.2	37.0	31 23.88	− 0.45	. .	−52.25	23 30 31.18	− 2.88
	7	μ Geminorum	P.	5.2	8.0	9.6	16.1	18.4	20.7	27.2	28.9	31.8	16 18.43	− 0.38	−52.68	−52.61	6 15 25.44	+ 0.03
	8	Moon II, S.	P.	59.6	2.6	4.4	11.6	14.0	16.4	23.5	25.2	28.3	28 13.96	− 0.31	. .	−52.71	6 27 20.94	−76.94
	9	γ Geminorum	P.	11.2	14.0	15.4	21.8	23.9	26.0	32.4	34.0	36.6	31 23.92	− 0.46	−52.69	−52.62	6 30 30.84	+ 0.04
	10	α Canis Majoris.	P.	19.7	22.3	24.0	30.4	32.6	34.8	40.9	42.7	45.4	40 32.53	− 0.82	−52.76	−52.63	6 39 39.08	+ 0.05
	11	51 Cephei	P.	. .	. .	. .	. .	. .	. .	48.0	19.5	11.0	41 58.10	+13.88	. .	−52.63	6 41 19.35	+ 0.98
	12	α Canis Minoris	Sk.	27.3	29.9	31.5	37.7	39.7	41.7	47.9	49.4	51.9	33 39.67	− 0.51	−52.83	−52.71	7 32 46.45	− 0.04
	13	β Geminorum	Sk.	20.3	23.0	24.8	31.7	34.2	36.4	43.3	45.2	48.0	38 34.10	− 0.23	−52.77	−52.71	7 37 41.16	+ 0.03
	14	ι Ursæ Majoris	Sk.	. .	. .	26.2	29.4	32.3	35.5	38.6	. .	. .	51 32.40	+ 0.17	. .	−52.76	8 50 39.81	+ 0.20
	15	θ Ursæ Majoris	Sk.	2.8	6.9	9.5	19.5	22.6	26.0	36.0	38.6	42.0	25 22.76	+ 0.28	. .	−52.78	9 24 30.26	+ 0.13
	16	Venus I, N.	Sk.	35.0	37.4	39.0	. .	. .	. .	56.0	57.8	0.3	53 47.58	− 0.41	. .	−52.88	9 52 54.29	+ 0.37
	17	Venus II, S.	Sk.	. .	. .	44.1	46.1	48.3	50.5	52.6	. .	. .	53 48.32	− 0.41	. .	−52.88	9 52 55.03	− 0.37
26	18	Sun I, N.	Sk.	25.0	28.0	29.7	35.7	38.2	39.9	46.3	47.9	50.5	19 37.91	− 0.46	. .	−52.90	10 18 44.55	. .
	19	Sun II, S.	Sk.	34.7	37.3	38.9	45.1	47.2	49.3	55.6	57.0	59.7	21 47.20	− 0.46	. .	−52.90	10 20 53.84	. .
	20	δ Leonis	Sk.	. .	. .	. .	. .	21.6	23.8	26.0	. .	34.8	8 21.60	− 0.33	−52.89	−52.85	11 7 28.42	− 0.02
	21	λ Draconis	Sk.	14.0	21.5	26.2	43.7	49.9	56.1	13.6	18.2	25.8	24 49.89	+ 1.31	. .	−52.86	11 23 58.34	+ 0.37
	22	12 Canum Venat.	Sk.	49.0	52.2	54.2	2.0	5.1	7.5	15.3	17.4	20.4	51 4.79	− 0.05	−53.07	−52.92	12 50 11.82	+ 0.15
	23	Polaris, S. P.	Sk.	. .	37.0	11.0	48.0	20.0	54.0	59.0	58.0	8.0	14 45.89	−31.22	. .	−52.94	1 13 21.73	− 3.07
	24	α Virginis	Sk.	18.7	21.3	22.9	29.2	31.2	33.3	39.4	41.0	43.6	19 31.18	− 0.68	−52.96	−52.94	13 18 37.56	0.00
	25	α Scorpii	Sk.	27.3	30.0	31.9	38.6	40.9	43.2	50.0	51.7	54.6	22 40.91	− 0.88	−53.06	−53.06	16 21 46.97	− 0.01
	26	ζ Ophiuchi	Sk.	0.2	2.6	4.3	10.5	12.6	14.5	20.8	22.4	25.0	31 12.54	− 0.71	−53.10	−53.07	16 30 18.76	+ 0.03
	27	η Herculis	Sk.	15.8	18.9	21.0	28.9	31.5	34.2	42.0	44.0	47.4	39 31.52	− 0.11	−53.07	−53.07	16 38 38.34	+ 0.01
	28	B. A. C. 5731	Sk.	14.4	16.1	20.8	23.2	25.6	27.9	30.3	35.1	36.9	56 25.59	− 0.25	. .	−53.09	16 55 32.25	− 1.83
	29	B. A. C. 5781	Sk.	56.2	58.8	0.4	6.9	8.9	11.0	17.4	19.0	21.7	4 8.92	− 0.77	. .	−53.10	17 3 15.05	− 2.39
	30	B. A. C. 5871	Sk.	25.9	29.8	32.0	40.9	44.0	46.9	55.9	58.0	1.8	17 43.91	+ 0.04	. .	−53.10	17 16 50.85	− 1.73
	31	B. A. C. 5917	Sk.	33.8	38.6	42.0	54.2	58.3	2.3	14.6	17.7	23.0	24 58.28	+ 0.50	. .	−53.11	17 24 5.67	− 1.51
	32	B. A. C. 5962	Sk.	32.2	35.1	36.9	44.2	46.6	48.9	55.9	57.8	0.6	32 46.47	− 0.25	. .	−53.11	17 31 53.11	− 1.99
	33	B. A. C. 5988	Sk.	39.4	42.0	43.8	50.4	52.7	55.0	1.8	3.4	6.2	36 52.74	− 0.34	. .	−53.11	17 35 59.29	− 2.08
	34	Mars I, N.	Sk.	51.0	53.7	55.5	. .	. .	. .	13.8	15.6	18.7	52 4.72	− 0.89	. .	−53.12	17 51 10.71	+ 0.72
	35	Mars II, S.	Sk.	. .	. .	1.5	3.7	5.9	8.2	10.6	. .	. .	52 5.98	− 0.89	. .	−53.12	17 51 11.97	− 0.54
	36	B. A. C. 6162	Sk.	20.8	24.3	26.5	34.9	37.7	40.6	49.1	51.1	54.6	4 37.73	− 0.02	. .	−53.13	18 3 44.58	− 1.96
	37	B. A. C. 6178	Sk.	52.8	55.8	57.7	4.9	7.2	9.6	16.8	18.6	21.5	8 7.21	− 0.24	. .	−53.13	18 7 13.84	− 2.12
	38	B. A. C. 6203	Sk.	24.0	27.5	29.5	37.8	40.6	43.3	51.6	53.6	57.2	12 40.57	− 0.05	. .	−53.13	18 11 47.39	− 2.01
	39	Weisse (2) 395	Sk.	49.8	52.5	54.0	0.6	2.9	5.2	11.8	13.2	15.9	16 2.88	− 0.38	. .	−53.13	18 15 9.37	− 2.28
	40	Weisse (2) 415	Sk.	. .	. .	. .	. .	. .	. .	. .	51.7	54.5	16 41.38	− 0.39	. .	−53.13	18 15 47.86	− 2.29
	41	α Lyræ	Sk.	22.0	25.2	27.1	35.1	37.6	40.0	48.0	50.2	53.4	33 37.62	− 0.12	−52.96	−53.15	18 32 44.35	− 0.17
	42	51 Cephei, S. P.	Sk.	. .	. .	52.0	11.0	30.0	45.5	3.0	. .	. .	42 28.30	−14.90	. .	−53.16	18 41 20.24	+ 1.60
	43	β Lyræ	Sk.	8.9	11.9	13.7	21.0	23.4	25.8	33.1	35.0	38.0	46 23.42	− 0.21	−53.04	−53.16	18 45 30.05	− 0.09
	44	B. A. C. 6487	Sk.	40.4	42.9	44.6	50.9	53.0	55.2	1.4	2.9	5.5	54 52.98	− 0.35	. .	−53.16	18 53 59.47	− 2.51
	45	B. A. C. 6523	Sk.	20.3	23.9	25.9	33.9	36.7	39.4	47.4	49.4	53.0	0 36.66	− 1.05	. .	−53.16	18 59 42.45	− 3.86
	46	B. A. C. 6601	Sk.	12.9	17.6	20.7	32.0	36.0	39.8	51.2	54.0	58.8	12 35.89	+ 0.39	. .	−53.17	19 11 43.11	− 2.08
	47	τ Draconis	Sk.	8.0	16.3	21.7	42.6	49.9	56.6	18.0	23.4	31.8	18 49.92	+ 1.55	. .	−53.18	19 17 58.29	− 0.33
	48	B. A. C. 6718	Sk.	15.6	19.0	21.0	26.6	29.3	32.2	35.0	37.8	. .	31 32.15	− 0.05	. .	−53.18	19 30 38.92	− 2.32
	49	B. A. C. 6724	Sk.	21.4	24.0	25.6	32.0	34.0	36.2	42.7	44.2	46.8	32 34.10	− 0.44	. .	−53.18	19 31 40.48	− 2.63
	50	B. A. C. 6784	Sk.	22.0	25.0	26.8	31.8	34.3	36.6	39.0	41.5	. .	42 36.64	− 0.21	. .	−53.18	19 41 43.25	− 2.45

3. Wire B used.
6. Wire A used.
31. Bisections at wires C_1 and D_3.
47. Bisections at wires C_1 and C_5.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan's Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	54 20	9 29.5	27.6	11.0	4.2	35	175	. .	. .	. .	240	32.0	54 23 43.9	. .	+ 1 20.2	105 31 25.3	. .
2	54 20	29.5	27.6	11.0	4.2	34	. .	050	. .	115	. .	32.0	54 24 1.2	60.1	+ 1 20.2	105 31 42.6	. .
3	56 6	29.8	27.3	10.1	5.2	33	. .	700	. .	690	. .	32.0	56 7 34.3	. .	+ 1 25.6	107 15 21.1	+12.8
4	56 6	29.8	27.3	10.1	5.2	34	. .	210	. .	250	. .	32.0	56 9 59.0	. .	+ 1 25.8	107 17 46.0	+12.9
5	341 16	10 0.6	29.5	10.2	5.0	39	. .	340	. .	310	. .	32.0	341 18 40.8	. .	— 19.5	32 24 42.5	+ 9.9
6	20 16	3.0	0.9	13.5	6.0	30	. .	205	. .	320	375	32.0	20 23 29.7	. .	+ 21.5	71 30 12.4	+15.5
7	16 14	1.0	0.6	14.3	6.6	31	. .	255	. .	300	. .	32.1	16 18 41.9	. .	+ 16.7	67 25 19.8	+ 1.5
8	10 46	9 29.3	29.0	11.2	4.5	32	. .	. .	395	342	355	32.1	10 50 30.1	. .	+ 10.9	61 57 2.2	. .
9	22 18	10 3.0	0.2	13.3	7.8	30	. .	570	. .	595	. .	32.1	22 22 52.1	. .	+ 23.5	73 29 36.8	+ 2.1
10	55 20	0.6	29.0	11.5	6.3	30	. .	930	. .	985	. .	32.1	55 24 47.9	. .	+ 1 22.4	106 32 31.5	+ 1.5
11	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	65.6	. .	. . . .	. .
12	33 16	9 28.1	28.5	11.2	4.7	33	. .	005	. .	076	. .	29.8	33 20 15.0	. .	+ 37.3	84 27 13.5	— 0.4
13	10 30	10 2.0	2.9	14.5	9.1	34	. .	458	. .	480	. .	29.8	10 33 49.3	68.5	+ 10.6	61 40 21.1	+ 0.5
14	350 18	9 29.4	0.2	13.5	4.0	34	. .	. .	. .	100	159	29.8	350 21 58.1	. .	— 9.6	41 28 9.7	— 1.3
15	346 36	10 2.0	1.9	13.0	5.7	37	. .	135	. .	135	. .	29.8	346 39 10.2	. .	— 13.4	37 45 18.0	+ 0.2
16	24 38	0.5	29.8	14.5	6.5	31	774	. .	. .	. .	680	29.8	24 42 33.1	. .	+ 25.8	75 49 20.1	. .
17	24 38	0.5	29.8	14.5	6.5	31	. .	025	. .	019	. .	29.8	24 42 43.8	. .	+ 25.9	75 49 30.9	. .
18	28 8	0.6	0.4	15.0	7.0	30	746	776	. .	. .	. .	29.8	28 12 47.5	. .	+ 30.1	79 19 38.8	. .
19	28 40	1.3	29.2	11.7	5.9	31	. .	. .	. .	828	935	29.8	28 44 31.4	73.2	+ 30.8	79 51 23.4	. .
20	17 36	2.9	2.4	17.0	8.1	30	. .	260	. .	400	. .	29.8	17 40 52.2	. .	+ 17.9	68 47 31.3	+ 0.5
21	328 48	0.6	1.0	12.5	7.3	30	. .	086	. .	132	. .	29.8	328 52 59.4	. .	— 33.8	19 58 46.8	— 2.2
22	359 50	2.0	2.9	15.0	7.1	33	. .	620	. .	676	. .	29.8	359 54 2.4	. .	— 0.1	51 0 23.5	+ 1.5
23	307 30	2.8	5.4	15.5	10.9	35	844	. .	934	. .	872	29.8	307 33 25.7	. .	— 1 12.4	358 38 34.5	— 0.1
24	49 18	9 28.3	28.8	10.0	4.0	29	. .	250	. .	322	. .	29.8	49 23 12.8	76.0	+ 1 5.0	100 30 39.0	+ 0.2
25	64 56	10 0.6	28.9	10.7	4.3	29	. .	810	. .	855	. .	30.5	65 1 4.2	72.2	+ 1 59.8	116 9 25.2	+ 1.2
26	49 8	0.7	0.0	11.4	5.0	36	. .	. .	. .	150	. .	30.5	49 11 27.2	. .	+ 1 5.0	100 18 53.4	+ 2.0
27	359 40	2.0	2.7	15.7	7.3	34	142	112	. .	. .	. .	30.5	359 43 55.4	. .	— 0.3	50 50 16.3	+ 2.2
28	7 42	3.8	4.0	15.6	7.3	30	. .	. .	. .	772	798	30.5	7 46 46.4	. .	+ 7.7	58 53 15.3	+ 3.5
29	54 22	4.9	1.0	13.2	7.2	31	. .	502	. .	538	. .	30.5	54 26 35.5	. .	+ 1 18.6	105 34 15.3	—10.0
30	352 28	2.3	3.2	11.5	6.8	34	. .	660	. .	680	. .	30.5	352 31 48.3	. .	— 7.4	43 38 2.1	+ 6.7
31	338 40	0.4	1.0	10.9	5.5	31	323	. .	. .	. .	323	30.5	338 44 40.9	. .	— 22.0	29 50 40.1	+ 8.1
32	7 58	2.8	3.2	12.5	6.5	35	. .	240	. .	260	. .	30.5	8 1 39.0	. .	+ 8.0	59 8 8.2	+ 4.6
33	14 14	4.5	3.4	14.4	8.2	30	760	750	. .	. .	. .	30.5	14 18 46.2	. .	+ 14.4	65 25 21.8	+ 3.4
34	66 18	2.1	28.3	11.1	5.0	33	. .	160	. .	238	. .	30.5	66 22 12.1	. .	+ 2 8.5	117 30 41.8	. .
35	66 18	2.1	28.3	11.1	5.0	31	645	. .	. .	. .	890	30.5	66 22 33.8	. .	+ 2 8.5	117 31 3.5	. .
36	355 22	2.0	1.0	11.0	5.7	30	. .	834	. .	888	. .	30.5	355 26 47.6	. .	— 4.5	46 33 4.3	+ 7.6
37	7 26	3.3	1.6	13.2	6.0	30	. .	380	. .	378	. .	30.5	7 30 53.8	. .	+ 7.5	58 37 22.5	+ 5.8
38	356 42	2.6	2.6	12.7	5.8	31	838	800	. .	. .	. .	30.5	356 46 31.8	. .	— 3.2	47 52 49.8	+ 7.6
39	17 56	1.5	29.8	13.5	4.7	28	. .	. .	. .	632	. .	30.5	18 1 21.9	. .	+ 18.4	69 8 1.5	+ 4.0
40	17 56	1.5	29.8	13.5	4.7	31	. .	. .	. .	. .	775	30.5	18 0 34.0	. .	+ 18.4	69 7 13.6	+ 4.1
41	0 10	4.9	3.5	14.5	8.8	36	. .	048	. .	090	. .	30.5	0 13 24.8	. .	+ 0.2	51 19 46.2	+ 0.7
42	306 6	3.3	0.3	9.5	6.0	38	180	. .	220	. .	193	30.5	306 8 55.0	. .	— 1 17.6	357 13 58.6	+ 1.8
43	5 36	3.5	3.0	13.1	6.4	32	. .	610	. .	690	. .	30.5	5 40 18.6	. .	+ 5.6	56 46 45.4	+ 0.5
44	23 56	2.6	0.6	12.6	5.1	37	150	204	. .	. .	. .	30.5	23 59 10.9	. .	+ 25.3	75 5 57.4	+ 4.5
45	79 26	3.8	29.4	9.9	6.0	33	314	450	. .	. .	. .	30.5	79 30 8.1	. .	+ 4 57.3	130 41 26.6	— 9.4
46	341 20	4.0	3.7	12.0	7.3	32	. .	193	. .	193	. .	30.5	341 24 25.6	. .	— 19.2	32 30 27.6	+ 9.9
47	325 44	3.5	0.9	12.3	8.6	38	570	. .	. .	. .	600	30.5	325 46 47.7	64.2	— 38.8	16 52 30.1	+ 1.2
48	356 42	4.3	4.8	14.0	6.4	37	020	980	. .	. .	. .	30.5	356 45 11.0	. .	— 3.2	47 51 29.0	+ 9.5
49	22 38	2.8	2.5	13.3	6.5	33	. .	. .	. .	330	320	30.5	22 42 8.7	. .	+ 23.9	73 48 53.8	+ 6.5
50	5 24	2.3	2.0	12.9	7.0	37	182	132	. .	. .	. .	30.5	5 27 9.8	. .	+ 5.4	56 33 36.4	+ 9.1

No.	Barom.	At. Ther
	in.	°
2	30.24	62.3
11	30.26	64.5
13	30.26	67.0
19	30.25	72.4
24	30.23	75.0
25	30.20	72.6
47	30.21	67.4

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
1	— 0.8	+ 8.7	. .	+ 7.9
2	— 0.8	— 8.6	. .	— 9.4
8	—10 55.1	— 16 8.3	. .	— 27 3.4
16	— 2.1	+ 5.4	0.0	+ 3.3
17	— 2.1	— 5.4	. .	— 7.5
18	— 4.2	+ 15 52.3	. .	+ 15 48.1
19	— 4.2	— 15 52.3	. .	— 15 56.5
34	— 13.0	+ 10.8	. .	— 2.2
35	— 13.0	— 10.9	. .	— 23.9

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Aug. 26	1	B. A. C. 6794	Sk.	9.0	11.7	13.4	19.8	22.0	24.1	30.5	32.2	35.0	44 21.97	− 0.41	. .	−53.18	19 43 28.38	− 2.63
	2	B. A. C. 6827	Sk.	. .	54.4	56.0	0.3	2.7	4.9	7.1	9.4	. .	49 4.90	− 0.35	. .	−53.19	19 48 11.36	− 2.58
	3	B. A. C. 6839	Sk.	4.0	6.7	8.2	14.6	16.8	18.9	25.3	27.0	29.4	51 16.77	− 0.44	. .	−53.19	19 50 23.14	− 2.69
	4	B. A. C. 6882	Sk.	. .	. .	18.6	20.9	23.0	25.3	27.4	. .	. .	57 23.04	− 0.34	. .	−53.19	19 56 29.51	− 2.60
	5	B. A. C. 6895	Sk.	25.8	29.5	31.8	41.5	44.7	47.7	57.3	59.5	3.6	58 44.60	+ 0.12	. .	−53.19	19 57 51.53	− 2.35
	6	B. A. C. 6986	Sk.	8.0	11.3	13.4	18.6	21.3	24.0	26.8	29.6	. .	13 24.04	− 0.10	. .	−53.20	20 12 30.74	− 2.48
	7	B. A. C. 6998	Sk.	32.1	35.2	37.2	14.3	46.9	49.4	56.8	58.6	1.9	14 46.93	− 0.19	. .	−53.20	20 13 53.54	− 2.54
	8	XX, 15	Sk.	31.2	34.0	35.8	12.5	44.8	47.0	54.0	55.6	58.4	44 44.81	− 0.87	. .	−53.21	20 43 50.73	− 3.71
	9	α Cephei (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	10	α Cephei	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	11	Saturn I, S.	Sk.	37.3	39.7	41.4	. .	. .	. .	58.4	0.0	2.6	39 49.90	− 0.77	. .	−53.25	21 38 55.88	. .
	12	Saturn II, N.	Sk.	. .	. .	48.8	50.9	52.9	55.0	57.3	. .	. .	39 52.98	− 0.77	. .	−53.25	21 38 58.96	. .
	13	α Aquarii (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	14	α Aquarii.	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	15	9 Draconis, S. P.	Sk.	14.3	2.8	56.1	31.3	21.9	13.4	48.0	41.3	. .	25 22.25	− 3.56	. .	−53.30	10 24 25.39	+ 0.15
	16	ζ Pegasi	Sk.	58.0	0.6	2.2	8.4	10.5	12.6	18.9	20.4	23.0	36 10.51	− 0.51	−53.32	−53.31	22 35 16.69	+ 0.07
	17	ι Cephei	Sk.	39.7	46.0	49.8	4.7	9.7	14.8	29.0	33.1	39.0	46 9.53	+ 0.81	. .	−53.32	22 45 17.02	− 0.01
	18	α Piscis Australis	Sk.	28.3	31.2	33.0	40.1	42.6	44.9	51.9	53.7	56.6	51 42.48	− 0.93	−53.30	−53.32	22 50 48.23	+ 0.02
	19	α Pegasi	Sk.	16.1	18.8	20.5	26.7	28.6	30.8	37.3	38.7	41.5	59 28.78	− 0.46	−53.23	−53.33	22 58 34.99	− 0.07
	20	γ Cephei	Sk.	15.0	25.8	32.7	0.1	9.3	18.0	45.6	51.0	3.3	35 8.98	+ 2.22	. .	−53.35	23 34 17.85	+ 0.01
29	21	ι Ursæ Majoris.	P.	18.0	21.8	24.0	33.3	36.6	39.6	49.0	51.0	55.0	51 36.48	0.00	. .	−56.54	8 50 39.94	+ 0.23
	22	ε Leonis	P.	. .	. .	38.6	40.9	43.2	45.4	47.7	. .	. .	39 43.16	− 0.25	−56.77	−56.56	9 38 46.35	+ 0.15
	23	Venus I, S.	P.	51.4	54.3	55.7	. .	. .	. .	12.4	14.2	16.7	13 4.12	− 0.33	. .	−56.59	10 12 7.20	+ 0.33
	24	Venus II, N.	P.	. .	. .	0.6	2.7	4.8	6.8	8.9	. .	. .	13 4.78	− 0.33	. .	−56.59	10 12 7.86	− 0.33
30	25	Sun I, N.	P.	5.8	8.4	10.0	16.0	18.2	20.4	26.6	28.0	30.8	34 18.24	− 0.34	. .	−56.60	10 33 21.30	. .
	26	Sun II, S.	P.	. .	. .	. .	27.0	29.2	31.3	35.5	37.0	39.6	36 27.14	− 0.34	. .	−56.60	10 35 30.20	. .
	27	Mercury I, N.	P.	1.4	4.0	5.5	. .	. .	. .	22.0	23.6	26.5	7 13.83	− 0.36	. .	−56.62	11 6 16.85	+ 0.15
	28	Mercury II, S.	P.	. .	. .	10.0	12.1	14.0	16.2	18.3	. .	. .	7 14.12	− 0.36	. .	−56.62	11 6 17.14	− 0.14
	29	12 Canum Venat.	P.	52.6	56.0	58.0	5.9	8.5	11.0	19.0	21.0	24.4	51 8.49	− 0.13	−56.73	−56.68	12 50 11.68	+ 0.05
	30	Polaris, S. P.	P.	. .	. .	. .	8.5	43.0	15.5	. .	. .	. .	14 42.27	−18.81	. .	−56.69	1 13 26.77	− 0.35
	31	α Virginis	P.	22.2	24.8	26.5	32.7	34.7	36.8	43.0	44.4	47.2	19 34.70	− 0.44	−56.75	−56.69	13 18 37.57	+ 0.04
	32	ζ Virginis	P.	5.4	8.0	9.6	15.6	17.7	19.8	25.6	27.3	30.0	29 17.67	− 0.39	−56.76	−56.70	13 28 20.58	+ 0.06
	33	η Bootis	P.	29.3	31.9	33.5	39.9	42.1	44.3	50.7	52.4	55.0	49 42.12	− 0.29	−56.71	−56.71	13 48 45.12	− 0.05
	34	η Herculis	P.	19.3	22.7	24.5	32.6	35.2	37.8	45.8	47.7	51.1	39 35.19	− 0.15	−56.79	−56.80	16 38 38.24	0.00
	35	B. A. C. 5629	P.	1.2	5.6	8.3	19.3	23.0	26.6	37.5	40.3	44.7	41 22.94	+ 0.10	. .	−56.82	16 40 26.22	− 1.26
	36	κ Ophiuchi	P.	32.0	34.5	36.0	42.3	44.3	46.4	52.5	54.0	56.7	52 44.30	− 0.37	−56.85	−56.82	16 51 47.11	+ 0.07
	37	ε Ursæ Minoris.	P.	31.1	42.3	13.0	28.0	42.6	57.8	13.0	43.2	54.8	59 42.87	+ 2.47	. .	−56.82	16 58 48.52	− 1.15
	38	α^1 Herculis	P.	43.4	46.0	47.6	54.0	56.2	58.3	4.6	6.0	8.8	9 56.10	− 0.34	−56.86	−56.83	17 8 58.93	+ 0.05
	39	XVII, 4	P.	35.8	38.9	40.8	48.3	50.9	53.2	0.8	2.6	5.9	16 50.80	− 0.58	. .	−56.84	17 15 53.38	− 2.75
	40	B. A. C. 5918	P.	46.6	51.8	54.5	6.5	10.4	14.4	26.2	29.0	34.0	25 10.38	+ 0.16	. .	−56.84	17 24 13.70	− 1.38
	41	B. A. C. 5975	P.	1.3	5.2	7.4	16.8	20.0	23.0	32.2	34.7	38.5	34 19.90	− 0.03	. .	−56.84	17 33 23.03	− 1.65
	42	μ Herculis	P.	19.0	22.0	23.8	30.6	32.9	35.4	42.0	43.8	46.8	42 32.92	− 0.25	−56.68	−56.85	17 41 35.82	− 0.17
	43	B. A. C. 6033	P.	30.5	33.3	35.0	41.8	44.0	46.4	53.0	54.8	57.7	44 44.06	− 0.27	. .	−56.85	17 43 46.94	− 2.03
	44	Mars I, N.	P.	2.6	5.3	7.2	. .	. .	. .	25.6	27.2	30.3	59 16.37	− 0.54	. .	−56.85	17 58 18.98	+ 0.60
	45	Mars II, S.	P.	. .	. .	12.8	15.0	17.5	19.8	22.0	. .	. .	59 17.42	− 0.54	. .	−56.85	17 58 20.03	− 0.45
	46	B. A. C. 6162	P.	24.8	28.2	30.4	38.7	41.6	44.4	52.8	55.0	58.4	4 41.59	− 0.10	. .	−56.85	18 3 44.64	− 1.87
	47	B. A. C. 6203	P.	27.9	31.2	33.3	41.5	44.0	46.9	55.3	57.4	0.9	12 44.27	− 0.12	. .	−56.86	18 11 47.29	− 1.92
	48	B. A. C. 6218	P.	54.9	56.9	2.4	5.0	7.7	10.3	13.2	18.5	20.6	14 7.72	− 0.13	. .	−56.86	18 13 10.73	− 1.95
	49	B. A. C. 6235	P.	12.8	15.9	17.8	25.4	27.9	30.3	37.9	39.7	43.0	16 27.86	− 0.18	. .	−56.86	18 15 30.82	− 2.02
	50	B. A. C. 6349	P.	53.7	57.2	59.0	7.0	9.5	12.2	20.0	21.9	25.2	32 9.52	− 0.15	. .	−56.86	18 31 12.51	− 2.05

2. Bisections at wires II and III.
15, 17, 20, 37. Bisections at set C.
25. Telescope micrometer reading increased one revolution in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	20 0	10 2.7	1.0	12.9	6.0	36	200	178	. .	. .	. .	30.5	20 3 24.8	. .	+ 20.8	71 10 6.8	+ 7.4
2	15 4	2.7	1.1	11.0	6.0	33	980	965	. .	. .	. .	30.5	15 7 59.3	. .	+ 15.4	66 14 35.7	+ 8.3
3	22 32	4.9	4.0	14.9	8.2	38	. .	228	. .	300	. .	30.5	22 34 51.0	. .	+ 23.7	73 41 35.9	+ 7.4
4	14 22	4.6	3.5	15.1	8.2	33	760	780	. .	. .	. .	30.5	14 25 59.8	. .	+ 14.7	65 32 35.7	+ 8.7
5	349 4	5.0	3.5	14.0	9.5	32	. .	900	. .	936	. .	30.5	349 8 1.1	. .	− 11.0	40 14 23.3	+10.3
6	358 52	5.0	5.3	15.5	9.5	38	572	568	. .	. .	. .	30.5	358 54 45.5	. .	− 1.1	50 1 5.6	+10.3
7	4 14	2.8	2.9	14.0	7.5	34	. .	460	. .	490	. .	30.5	4 17 50.3	64.2	+ 4.3	55 24 15.8	+10.1
8	64 52	4.0	0 5	12.1	7.7	40	. .	040	. .	100	. .	30.5	64 54 25.0	. .	+ 2 1.3	116 2 47.5	+ 4.6
9	203 6	6.0	3.5	13.0	6.8	35	480	528	. .	. .	. .	30.5	203 9 32.5	. .	+ 24.4	27 56 24.3	− 3.9
10	336 46	1.8	0.4	9.6	5.1	32	. .	. .	. .	038	092	30.5	336 50 30.9	63.3	− 24.4	27 56 27.7	− 0.5
11	54 22	3.3	0.0	13.0	6.0	35	. .	840	. .	928	. .	30.5	54 25 29.6	. .	+ 1 19.8	105 33 10.6	. .
12	54 22	3.3	0.0	13.0	6.0	37	192	. .	. .	. .	280	30.5	54 25 8.8	. .	+ 1 19.8	105 32 49.8	. .
13	140 8	0.5	0.0	11.3	7.4	34	755	800	. .	. .	. .	30.5	140 11 47.1	. .	− 47.7	90 55 21.8	+ 1.0
14	39 44	4.6	2.3	14.0	9.0	32	. .	. .	. .	. .	990	30.5	39 48 12.5	. .	+ 47.7	90 55 21.4	+ 0.6
15	295 12	3.5	3.0	12.5	8.2	30	146	. .	. .	. .	146	30.5	295 16 56.3	. .	− 2 0.7	346 21 16.8	+ 1.0
16	28 38	3.4	0.2	11.0	5.8	33	. .	448	. .	492	. .	30.5	28 42 7.2	. .	+ 31.4	79 48 59.8	+ 1.5
17	333 18	4.8	4.5	14.5	10.7	36	010	. .	. .	. .	970	30.5	333 21 25.1	. .	− 28.8	24 27 17.5	+ 1.4
18	69 4	4.8	2.1	13.0	8.0	34	. .	040	. .	098	. .	30.5	69 7 55.9	. .	+ 2 29.3	120 16 46.4	+ 1.2
19	24 18	6.5	4.7	17.0	10.0	37	. .	658	. .	640	. .	30.5	24 20 58.8	. .	+ 26.0	75 27 46.0	+ 1.6
20	321 54	3.8	2.0	11.9	8.2	32	960	. .	. .	. .	956	30.5	321 58 13.7	60.2	− 44.9	13 3 50.0	+ 1.0
21	350 18	4.6	4.1	15.1	8.7	33	. .	860	. .	852	. .	33.6	350 22 1.8	. .	− 9.4	41 28 13.6	+ 1.7
22	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
23	26 18	4.5	6.3	15.9	10.4	34	220	. .	. .	. .	295	33.6	26 21 55.5	. .	+ 27.2	77 28 43.9	. .
24	26 18	4.5	1.3	15.9	10.4	34	. .	845	. .	860	. .	33.6	26 21 46.3	81.5	+ 27.2	77 28 34.7	. .
25	29 34	6.6	5.2	15.6	8.3	35	. .	050	. .	. .	. .	33.6	29 37 42.6	. .	+ 31.1	80 44 34.9	. .
26	30 6	3.5	3.0	10.3	6.7	35	. .	. .	. .	. .	335	33.6	30 9 25.8	. .	+ 31.8	81 16 18.8	. .
27	31 36	2.8	2.5	14.0	6.4	33	690	. .	. .	. .	590	33.6	31 40 6.5	. .	+ 33.7	82 47 1.4	. .
28	31 36	2.8	2.5	14.0	6.4	33	. .	300	. .	260	. .	33.6	31 40 12.0	83.1	+ 33.7	82 47 6.9	. .
29	359 50	4.6	6.3	17.8	8.8	33	. .	522	. .	578	. .	33.6	359 54 5.1	. .	− 0.1	51 0 26.2	+ 3.5
30	307 30	4.7	5.2	16.2	12.0	36	. .	020	025	990	. .	33.6	307 33 26.8	. .	− 1 10.8	358 38 37.2	+ 1.4
31	49 18	4.2	3.8	15.6	7.0	28	. .	938	. .	950	. .	33.6	49 23 17.0	. .	+ 1 3.4	100 30 41.6	+ 3.0
32	38 46	5.6	5.4	17.3	8.6	32	. .	045	. .	135	. .	33.6	38 50 27.3	. .	+ 43.8	89 57 32.3	+ 4.0
33	19 48	7.0	7.5	20.8	10.2	33	. .	985	. .	045	. .	33.6	19 51 55.8	. .	+ 19.7	70 58 36.7	+ 4.7
34	359 40	5.5	5.2	16.3	9.0	34	100	125	. .	. .	. .	33.2	359 43 56.3	. .	− 0.3	50 50 17.2	+ 3.2
35	342 54	5.5	5.2	13.8	8.4	31	. .	. .	. .	555	615	33.2	342 58 36.8	. .	− 16.8	34 4 41.2	+ 6.8
36	29 14	7.0	5.2	15.8	9.2	30	105	140	. .	205	180	33.2	29 18 56.5	78.6	+ 30.9	80 25 48.6	+ 3.4
37	316 36	7.8	7.0	16.5	13.3	33	560	. .	575	. .	590	33.2	316 40 2.3	. .	− 51.9	7 45 31.6	+ 1.7
38	24 18	9.0	7.0	19.1	11.6	36	. .	810	. .	835	. .	33.2	24 21 12.1	. .	+ 25.0	75 27 58.3	+ 3.2
39	73 28	6.7	3.4	13.3	8.4	37	. .	260	. .	350	. .	33.2	73 31 8.1	. .	+ 3 3.8	124 40 33.1	−15.9
40	340 4	4.1	3.0	13.3	8.7	32	. .	135	. .	190	. .	33.2	340 8 28.3	. .	− 20.0	31 14 29.5	+ 8.3
41	350 10	8.3	7.2	16.9	7.4	33	. .	215	. .	235	. .	33.2	350 14 9.2	. .	− 9.5	41 20 20.9	+ 7.8
42	11 2	6.2	4.2	16.5	8.1	34	960	940	. .	. .	. .	33.2	11 5 43.6	. .	+ 10.8	62 12 15.6	+ 3.4
43	13 10	6.3	4.9	16.8	8.2	35	. .	990	. .	110	. .	33.2	13 13 26.6	. .	+ 13.0	64 20 0.8	+ 4.2
44	66 12	5.1	2.0	14.0	6.9	32	230	. .	. .	. .	260	33.2	66 16 26.4	. .	+ 2 5.2	117 24 52.8	. .
45	66 12	5.1	2.0	14.0	6.9	31	. .	070	. .	165	. .	33.2	66 16 43.9	. .	+ 2 5.2	117 25 10.3	. .
46	355 22	4.8	3.6	14.0	9.2	30	. .	795	. .	800	. .	33.2	355 26 48.4	. .	− 4.4	46 33 5.2	+ 8.1
47	356 42	6.0	5.0	14.9	9.3	31	830	770	. .	. .	. .	33.2	356 46 32.0	. .	− 3.1	47 52 50.1	+ 8.1
48	357 56	6.3	4.3	14.9	8.0	32	. .	. .	. .	860	. .	33.2	358 0 16.5	. .	− 1.9	49 6 35.8	+ 8.0
49	2 50	7.0	6.8	17.2	10.5	38	. .	. .	. .	085	100	33.2	2 52 54.6	. .	+ 2.8	53 59 18.6	+ 7.4
50	0 2	6.7	5.3	16.2	10.2	34	260	255	. .	. .	. .	33.2	0 5 53.5	73.0	+ 0.1	51 12 14.8	+ 8.3

No.	Barom.	At. Ther.
	in.	°
7	30.22	67.0
10	30.22	66.4
20	30.21	64.0
24	30.02	79.0
28	30.00	80.8
36	29.97	78.3
50	29.96	72.8

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
11	− 0.8	− 10.4	. .	− 11.2
12	− 0.8	+ 10.4	. .	+ 9.6
23	− 2.3	− 4.6	. .	− 6.9
24	− 2.3	+ 4.6	. .	+ 2.3
25	− 4.3	+ 15 51.9	. .	+ 15 47.6
26	− 4.4	− 15 51.9	. .	− 15 56.3
27	− 3.4	+ 2.8	. .	− 0.6
28	− 3.4	− 2.7	. .	− 6.1
44	− 12.5	+ 8.7	. .	− 3.8
45	− 12.5	− 8.8	. .	− 21.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Aug. 30	1	B. A. C. 6368 . .	P.	42.0	46.4	49.0	59.6	3.3	6.9	17.6	20.1	24.8	37 3.30	+ 0.08	. .	−56.87	18 36 6.51	− 1.82
	2	B. A. C. 6395 . .	P.	49.5	54.0	56.9	7.5	11.1	14.7	25.3	28.0	32.8	41 11.09	+ 0.09	. .	−56.87	18 40 14.31	− 1.84
	3	B. A. C. 6438 . .	P.	42.4	45.1	46.8	53.4	55.5	57.8	4.3	6.0	8.7	47 55.56	− 0.30	. .	−56.87	18 46 58.39	− 2.35
	4	B. A. C. 6601 . .	P.	17.2	21.8	24.4	36.0	40.0	43.8	55.0	57.8	2.7	12 39.86	+ 0.13	. .	−56.88	19 11 43.11	− 1.96
	5	B. A. C. 6721 . .	P.	47.4	51.2	53.4	2.4	5.7	8.6	17.9	20.1	23.9	32 5.62	− 0.04	. .	−56.88	19 31 8.70	− 2.19
	6	B. A. C. 6784 . .	P.	25.5	28.6	30.4	37.8	40.2	42.7	50.0	51.8	55.0	42 40.22	− 0.21	. .	−56.89	19 41 43.12	− 2.41
	7	B. A. C. 6794 . .	P.	12.6	15.2	16.8	23.3	25.4	27.7	34.1	35.8	38.5	44 25.49	− 0.31	. .	−56.89	19 43 28.29	− 2.60
	8	B. A. C. 6827 . .	P.	55.2	57.9	59.6	6.3	8.5	10.8	17.4	19.0	21.8	49 8.50	− 0.28	. .	−56.89	19 48 11.33	− 2.55
	9	B. A. C. 6851 . .	P.	21.5	24.6	26.3	33.9	36.4	38.8	46.2	48.0	51.3	52 36.33	− 0.20	. .	−56.89	19 51 39.24	− 2.42
	10	B. A. C. 6998 . .	P.	35.7	38.7	40.7	48.0	50.5	53.0	0.4	2.3	5.4	14 50.52	− 0.20	. .	−56.90	20 13 53.42	− 2.50
	11	O. Arg. S. 20578 .	P.	40.0	42.8	44.5	51.2	53.4	55.7	2.4	4.1	7.0	25 53.46	− 0.54	. .	−56.90	20 24 56.02	− 3.63
	12	O. Arg. S. 20601 .	P.	12.1	15.0	16.8	23.4	25.7	27.9	34.7	36.3	39.4	27 25.70	− 0.53	. .	−56.90	20 26 28.27	− 3.62
	13	Mural Zones 64, 16	P.	12.2	14.9	16.7	23.4	25.6	27.9	34.7	36.3	39.3	29 25.67	− 0.53	. .	−56.90	20 28 28.24	− 3.62
	14	XX, 17	P.	22.7	25.7	27.4	34.5	36.9	39.3	46.5	48.3	51.3	45 36.96	− 0.56	. .	−56.91	20 44 39.49	− 3.89
	15	Mural Zones 40, 29	P.	33.5	36.5	38.6	45.3	47.9	50.3	7.6	9.3	12.3	46 47.92	− 0.56	. .	−56.91	20 45 50.45	− 3.89
	16	σ^2 Ursæ Majoris, S.P.	P.	54.5	47.6	43.7	27.7	22.3	16.7	0.8	57.0	49.7	0 22.22	− 1.57	. .	−56.97	8 59 23.68	+ 0.33
	17	Anonymous . .	P.	. .	. .	38.3	40.6	42.9	45.0	47.1	. .	. .	8 42.78	− 0.52	. .	−56.91	21 7 45.35	− 3.63
	18	Transit Zones 176, 4	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	19	B. A. C. 7447 . .	P.	57.4	0.2	1.7	8.3	10.6	12.8	19.4	21.0	23.7	21 10.57	− 0.52	. .	−56.92	21 20 13.13	− 3.63
	20	Saturn I, N. . .	P.	34.2	36.9	38.4	. .	. .	. .	55.3	57.0	59.5	38 46.88	− 0.49	. .	−56.92	21 37 49.47	. .
	21	Saturn II, S. . .	P.	. .	. .	44.0	46.	48.1	50.4	52.6	. .	. .	38 48.22	− 0.49	. .	−56.92	21 37 50.81	. .
	22	Tr. Zones 205, 40 .	P.	25.7	28.5	30.0	36.4	38.4	40.5	47.0	48.5	51.3	17 38.48	− 0.49	. .	−56.94	22 16 41.05	− 3.48
	23	Tr. Zones 204, 17 .	P.	5.2	7.8	9.4	15.7	17.9	20.0	26.2	27.9	30.5	20 17.84	− 0.49	. .	−56.94	22 19 20.41	− 3.48
	24	B. A. C. 7872 . .	P.	20.2	23.0	25.0	32.1	34.7	37.0	44.3	46.0	49.3	30 34.62	− 0.57	. .	−56.94	22 29 37.11	− 3.98
	25	ζ Pegasi	P.	. .	. .	. .	. .	16.1	18.2	22.4	23.9	26.5	36 14.04	− 0.36	−56.97	−57.02	22 35 16.66	+ 0.01
	26	B. A. C. 7957 . .	P.	40.8	44.2	46.3	54.2	57.0	59.6	7.7	9.6	12.9	44 56.92	− 0.61	. .	−56.94	22 43 59.37	− 4.27
	27	α Piscis Australis .	P.	31.7	34.7	36.4	43.5	45.9	48.2	55.3	57.0	0.0	51 45.86	− 0.56	−57.01	−57.03	22 50 48.27	+ 0.02
	28	α Pegasi	P.	19.6	22.4	23.9	30.2	32.3	34.5	40.8	42.4	44.9	59 32.33	− 0.34	−56.86	−57.04	22 58 34.95	− 0.15
	29	Weisse 22^1 . . .	P.	25.5	27.8	29.5	35.6	37.7	39.8	46.0	47.5	50.1	4 37.72	− 0.46	. .	−56.95	23 3 40.31	− 3.30
	30	Weisse 103. . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	31	Weisse 104. . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	32	Weisse 109. . .	P.	. .	. .	. .	42.2	44.4	46.4	50.6	52.0	54.7	8 42.25	− 0.46	. .	−56.95	23 7 44.84	− 3.31
	33	Durch. 18°, 5165 .	P.	2.8	5.5	7.0	13.6	15.7	18.0	24.4	26.2	29.4	27 15.79	− 0.31	. .	−56.96	23 26 18.52	− 2.95
	34	Weisse (2) 628. .	P.	15.5	18.1	19.9	26.3	28.4	30.6	37.0	38.6	41.4	31 28.42	− 0.32	. .	−56.96	23 30 31.14	− 2.94
31,	35	Weisse (2) 395. .	F.	54.4	57.0	58.7	5.2	7.5	9.7	16.2	17.8	20.6	16 7.46	− 0.20	. .	−57.76	18 15 9.50	− 2.21
	36	B. A. C. 6298^1 . .	F.	31.7	35.0	37.0	. .	. .	. .	58.0	0.0	3.3	25 47.50	− 0.51	. .	−57.77	18 24 49.22	− 3.45
	37	B. A. C. 6298^2 . .	F.	. .	. .	42.4	45.2	47.8	50.3	52.9	. .	. .	25 47.72	− 0.51	. .	−57.77	18 24 49.44	− 3.45
	38	B. A. C. 6349 . .	F.	54.7	58.0	0.1	7.8	10.4	13.1	21.0	22.9	26.1	32 10.46	− 0.05	. .	−57.77	18 31 12.64	− 2.03
	39	α Lyræ	F.	. .	. .	. .	. .	. .	. .	52.7	54.5	57.9	33 42.16	− 0.05	−57.67	−57.74	18 32 44.37	− 0.05
	40	XVIII, 21 . . .	F.	31.9	34.9	36.7	43.5	45.9	48.3	55.2	56.9	59.8	40 45.90	− 0.45	. .	−57.77	18 39 47.68	− 3.22
	41	B. A. C. 6599 . .	F.	. .	. .	59.3	2.0	4.5	7.0	12.3	14.0	17.5	13 1.89	− 0.06	. .	−57.78	19 12 4.05	− 2.21
	42	Piazzi 67, S. P. .	F.	. .	. .	4.3	58.5	52.8	47.2	41.5	. .	. .	18 52.86	− 1.58	. .	−57.75	7 17 53.53	+ 0.02
	43	B. A. C. 6690 . .	F.	27.3	30.2	32.0	38.8	41.2	43.4	50.3	52.0	55.0	26 41.13	− 0.16	. .	−57.78	19 25 43.19	− 2.40
	44	κ Aquilæ	F.	58.9	1.3	2.9	9.0	11.2	13.2	19.4	20.9	23.4	31 11.13	− 0.36	−57.85	−57.76	19 30 13.01	+ 0.13
	45	γ Aquilæ	F.	7.4	9.9	11.5	17.7	19.8	21.9	28.2	29.6	32.2	41 19.80	− 0.27	−57.81	−57.77	19 40 21.76	+ 0.07
	46	XIX, 13 . . .	F.	. .	. .	35.4	38.0	40.8	43.2	. .	50.8	53.8	44 38.11	− 0.51	. .	−57.79	19 43 39.81	− 3.97
	47	λ Ursæ Minoris . .	F.	. .	. .	. .	. .	. .	41.0	33.0	. .	. .	49 51.98	+22.31	. .	−57.77	19 49 16.52	− 0.26
	48	XX (5)	F.	1.0	4.0	10.8	13.2	15.7	18.3	20.8	27.6	30.9	13 15.81	− 0.49	. .	−57.79	20 12 17.53	− 3.94
	49	B. A. C. 6998 . .	F.	. .	. .	. .	. .	. .	. .	1.3	3.0	6.1	14 51.25	− 0.09	. .	−57.79	20 13 53.37	− 2.49

12, 13. Wire B used.
33, 34. Wire A used.
42. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan's Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	343 42	10 8.2	6.8	16.2	10.3	33	970	930	. .	. .	. .	33.2	343 45 57.7	. .	− 16.2	34 52 2.7	+10.0
2	343 26	4.7	2.8	12.5	7.5	38	. .	100	. .	095	. .	33.2	343 28 57.8	. .	− 16.5	34 35 2.5	+10.1
3	17 34	6.9	7.0	17.9	10.4	38	745	760	. .	. .	. .	33.2	17 36 43.5	. .	+ 17.7	68 43 22.4	+ 5.9
4	341 20	6.5	4.5	12.8	8.7	32	. .	350	. .	395	. .	33.2	341 24 24.2	71.2	− 18.8	32 30 26.6	+10.8
5	350 56	5.9	4.9	14.0	8.9	33	600	610	. .	. .	. .	33.2	351 0 4.8	. .	− 8.8	42 6 17.2	+10.8
6	5 24	5.5	3.9	15.0	8.9	37	295	305	. .	. .	. .	33.2	5 27 8.1	. .	+ 5.3	56 33 34.6	+ 9.8
7	20 0	7.2	5.4	17.6	9.6	36	175	150	. .	. .	. .	33.2	20 3 23.7	. .	+ 20.4	71 10 5.3	+ 8.0
8	15 4	6.5	4.2	16.0	8.3	33	915	920	. .	. .	. .	33.2	15 7 59.3	. .	+ 15.1	66 14 35.6	+ 8.9
9	4 4	5.5	5.5	15.3	8.1	32	740	755	. .	. .	. .	33.2	4 8 17.5	. .	+ 4.0	55 14 42.7	+10.3
10	4 14	6.2	7.0	17.8	11.5	34	. .	450	. .	475	. .	33.2	4 17 49.4	. .	+ 4.2	55 24 14.8	+10.9
11	64 4	4.5	0.6	12.7	7.3	29	475	510	. .	. .	. .	33.2	64 9 9.1	. .	+ 1 54.9	115 17 25.2	+ 2.6
12	63 54	7.2	3.7	14.4	10.0	28	. .	875	. .	. .	. .	33.2	63 56 43.2	. .	+ 1 53.9	115 4 58.3	+ 2.8
13	63 40	8.2	5.5	16.3	11.4	39	. .	850	. .	. .	. .	33.2	63 39 53.6	. .	+ 1 52.6	114 48 7.4	+ 3.1
14	69 58	3.4	0.0	10.5	5.6	38	580	570	. .	. .	. .	33.2	70 0 51.3	. .	+ 2 32.7	121 9 45.2	+ 3.5
15	69 58	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
16	286 32	9.9	6.5	15.7	12.6	37	. .	355	. .	510	. .	33.2	286 35 2.4	. .	− 3 5.6	337 38 18.0	+ 2.1
17	61 6	5.5	2.5	14.3	8.5	25	. .	890	. .	. .	. .	33.2	61 12 3.0	. .	+ 1 41.5	112 20 5.7	+ 7.4
18	61 6	5.5	2.5	14.3	8.5	27	. .	. .	. .	. .	260	33.2	61 11 42.5	. .	+ 1 41.5	112 19 45.2	+ 7.4
19	60 32	7.7	5.6	17.2	10.6	33	. .	790	. .	855	. .	33.2	60 35 59.2	. .	+ 1 39.0	111 43 59.4	+ 8.6
20	54 26	3.4	1.0	13.0	4.9	30	310	. .	. .	. .	430	33.2	54 30 56.7	. .	+ 1 18.5	105 38 36.4	. .
21	54 26	3.4	1.0	13.0	4.9	29	. .	205	. .	195	. .	33.2	54 31 14.7	68.3	+ 1 18.6	105 38 54.5	. .
22	54 22	4.2	2.3	14.7	6.5	31	. .	295	. .	335	. .	33.2	54 26 41.0	. .	+ 1 18.4	105 34 20.6	+14.3
23	54 22	4.2	2.3	14.7	6.5	29	. .	020	. .	060	. .	33.2	54 27 15.9	. .	+ 1 18.4	105 34 55.5	+14.5
24	71 6	4.8	1.0	12.0	7.7	36	. .	920	. .	950	. .	33.2	71 9 15.4	. .	+ 2 42.8	122 18 19.4	+14.6
25	28 38	5.0	1.0	12.9	8.0	33	460	470	. .	. .	. .	33.2	28 42 7.9	. .	+ 30.7	79 48 59.8	+ 2.2
26	78 34	5.4	2.5	11.0	6.7	33	. .	985	. .	020	. .	33.2	78 38 0.2	. .	+ 4 31.3	129 48 52.7	+15.7
27	69 4	7.5	4.2	15.1	10.2	33	. .	765	. .	840	. .	33.2	69 8 0.5	. .	+ 2 26.1	120 16 47.8	+ 2.3
28	24 18	7.6	5.5	17.8	10.2	37	. .	748	. .	742	. .	33.2	24 20 59.4	. .	+ 25.4	75 27 46.0	+ 0.3
29	47 34	5.2	3.0	13.8	7.3	37	. .	375	. .	350	. .	33.2	47 37 8.1	. .	+ 1 1.4	98 44 30.7	+17.8
30	48 24	4.8	0.3	13.8	7.3	32	. .	. .	. .	. .	065	33.2	48 28 30.3	. .	+ 1 3.3	99 35 54.8	+18.0
31	48 24	4.8	0.3	13.8	7.3	30	. .	. .	. .	. .	330	33.2	48 28 56.8	. .	+ 1 3.3	99 36 21.3	+18.0
32	48 24	4.8	0.3	13.8	7.3	28	. .	. .	. .	. .	595	33.2	48 29 23.4	. .	+ 1 3.4	99 36 48.0	+18.0
33	20 4	3.3	2.3	13.9	5.8	33	380	405	. .	525	535	33.2	20 10 41.9	. .	+ 20.6	71 17 23.7	+16.4
34	20 16	7.2	5.5	17.7	9.8	30	. .	. .	. .	080	. .	33.2	20 23 30.1	. .	+ 20.9	71 30 12.2	+16.5
35	17 56	10.7	9.7	22.2	15.0	28	. .	094	. .	114	. .	33.9	18 1 23.5	. .	+ 18.1	69 8 2.8	+ 4.5
36	77 34	5.6	0.6	10.0	5.3	33	. .	. .	. .	322	318	33.9	77 38 12.5	. .	+ 4 7.3	128 48 41.0	−12.4
37	77 34	5.6	0.6	10.0	5.3	31	. .	824	. .	. .	. .	33.9	77 38 35.0	. .	+ 4 7.4	128 49 3.6	−12.4
38	0 2	10.0	6.2	17.5	12.4	34	. .	190	. .	190	. .	33.9	0 5 53.4	. .	+ 0.1	51 12 14.7	+ 8.4
39	0 10	9.6	8.0	17.9	11.8	35	. .	. .	. .	964	970	33.9	0 13 26.4	. .	+ 0.2	51 19 47.8	+ 3.1
40	67 12	8.2	4.5	14.9	9.8	32	654	660	. .	. .	. .	33.9	67 16 18.1	75.4	+ 2 11.8	118 24 51.1	− 8.0
41	0 56	13.4	12.5	25.5	18.4	38	. .	. .	. .	234	240	33.9	0 58 46.0	. .	+ 1.0	52 5 8.2	+ 9.6
42	287 36	10.0	7.3	17.2	13.5	35	. .	570	. .	578	. .	33.9	287 39 31.3	. .	− 2 53.0	338 42 59.5	+ 3.4
43	11 8	5.8	4.4	15.2	8.0	36	. .	112	. .	120	. .	33.9	11 11 27.0	. .	+ 11.0	62 17 59.2	+ 8.8
44	46 6	7.0	3.3	14.8	7.1	30	. .	476	. .	476	. .	33.9	46 10 53.4	. .	+ 58.0	97 18 12.6	+ 3.4
45	28 30	9.6	7.8	18.4	12.0	31	926	938	. .	. .	. .	33.9	28 34 27.0	. .	+ 30.4	79 41 18.6	+ 2.1
46	77 28	1.7	27.2	7.0	2.8	31	. .	560	. .	580	. .	33.9	77 32 42.3	. .	+ 4 6.6	128 43 10.1	− 4.8
47	309 54	10.1	8.4	18.3	14.1	30	. .	. .	. .	708	694	33.9	309 58 45.6	. .	− 1 6.5	1 4 0.3	+ 0.7
48	73 46	7.8	3.2	14.1	9.7	38	. .	176	. .	190	. .	33.9	73 48 54.6	. .	+ 3 9.9	124 58 25.7	− 0.8
49	4 14	8.2	9.1	21.7	12.7	34	. .	. .	. .	390	386	33.9	4 17 49.4	72.5	+ 4.2	55 24 14.8	+11.2

No.	Barom.	At. Ther.
	in.	°
4	29.97	71.7
21	29.96	69.1
40	30.11	76.0
49	30.10	74.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
20	− 0.8	+ 9.0	. .	+ 8.2
21	− 0.8	− 9.1	. .	− 9.9

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875													m. s.	s.	s.	s.	h. m. s.	s.
Aug. 31	1	Mural Zones 40, 29	F.	34.3	37.3	39.1	46.1	48.7	51.0	58.2	0.1	2.9	46 48.63	− 0.46	. .	−57.80	20 45 50.37	− 3.89
	2	Saturn, N.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	3	Saturn, S.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	4	λ Aquarii.	F.	54.8	57.4	58.8	5.0	7.0	9.2	15.3	16.9	19.5	47 7.10	− 0.36	−57.87	−57.85	22 46 8.89	+ 0.10
	5	α Piscis Australis	F.	32.5	35.6	37.2	44.3	46.6	48.9	56.0	57.8	0.8	51 46.63	− 0.46	−57.87	−57.85	22 50 48.32	+ 0.06
	6	α Pegasi	F.	. .	. .	. .	. .	. .	. .	41.7	43.1	45.7	59 33.12	− 0.24	−57.74	−57.85	22 58 35.03	− 0.08
	7	Venus I, N.	P.	23.5	26.0	27.8	. .	. .	. .	44.5	45.9	48.7	22 36.07	− 0.21	. .	−58.15	10 21 37.71	+ 0.34
	8	Venus II, S.	P.	. .	. .	32.6	34.6	36.8	38.9	40.9	. .	. .	22 36.76	− 0.21	. .	−58.15	10 21 38.40	− 0.35
Sept. 1	9	Sun, N.	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	10	Sun II, S.	P.	32.0	34.5	36.1	42.3	44.4	46.4	52.7	54.2	56.7	43 44.37	− 0.22	. .	−58.15	10 42 46.00	−64.30
	11	12 Canum Venat.	P.	54.0	57.1	59.3	4.4	6.9	. .	. .	. .	. .	51 9.68	+ 0.08	−58.14	−58.05	12 50 11.71	+ 0.09
	12	η Bootis	P.	30.5	33.2	34.8	41.3	43.4	45.6	52.0	53.6	56.3	49 43.41	− 0.16	−58.15	−58.05	13 48 45.20	+ 0.05
	13	B. A. C. 5917	P.	. .	. .	. .	3.5	7.6	11.7	19.7	22.9	28.1	25 3.57	+ 0.32	. .	−58.17	17 24 5.72	− 1.25
	14	B. A. C. 5962	P.	37.2	40.0	41.9	49.0	51.4	53.9	1.0	2.8	5.9	32 51.46	− 0.12	. .	−58.17	17 31 53.17	− 1.87
	15	B. A. C. 5975	P.	. .	. .	. .	. .	. .	. .	33.5	35.7	39.8	34 21.12	+ 0.09	. .	−58.17	17 33 23.04	− 1.59
	16	XVII, 16	P.	54.7	56.4	0.7	2.8	5.2	7.3	9.5	13.9	15.4	41 5.10	− 0.42	. .	−58.17	17 40 6.51	− 2.62
	17	B. A. C. 6036	P.	28.4	32.1	34.5	43.5	46.7	49.6	58.6	1.0	4.7	44 46.57	+ 0.07	. .	−58.17	17 43 48.47	− 1.65
	18	O. Arg. N. 17522	P.	19.6	23.2	25.4	34.7	37.7	40.8	49.8	52.0	55.7	45 37.66	+ 0.07	. .	−58.17	17 44 39.56	− 1.66
	19	Mars I, N.	P.	50.6	53.6	55.2	. .	. .	. .	13.6	15.5	18.3	3 4.47	− 0.45	. .	−58.17	18 2 5.85	+ 0.64
	20	Mars II, S.	P.	. .	. .	1.0	3.3	5.6	7.8	10.2	. .	. .	3 5.58	− 0.45	. .	−58.17	18 2 6.96	− 0.47
	21	δ Ursæ Minoris	P.	59.5	43.5	9.5	. .	. .	. .	. .	. .	. .	13 27.39	+ 6.58	. .	−58.17	18 12 35.80	− 0.03
	22	B. A. C. 6218	P.	52.9	56.0	58.1	6.3	8.9	11.6	19.8	21.8	25.1	14 8.94	− 0.02	. .	−58.18	18 13 10.74	− 1.90
	23	Weisse (2) 395	P.	. .	. .	3.4	5.6	7.8	10.0	12.5	. .	. .	16 7.86	− 0.19	. .	−58.18	18 15 9.49	− 2.19
	24	Weisse (2) 415	P.	33.0	35.7	37.5	44.0	46.2	48.4	55.0	56.5	59.3	16 46.18	− 0.19	. .	−58.18	18 15 47.81	− 2.19
	25	Weisse (2) 475	P.	23.5	26.4	28.0	34.5	36.6	38.7	45.4	47.0	49.7	18 36.64	− 0.19	. .	−58.18	18 17 38.27	− 2.20
	26	XVIII, 15	P.	56.9	59.9	1.8	8.9	11.3	13.6	21.3	22.8	25.7	31 11.36	− 0.48	. .	−58.18	18 30 12.70	− 3.27
	27	α Lyræ	P.	27.2	30.3	32.3	40.1	42.6	45.3	53.0	55.0	58.4	33 42.69	− 0.04	−58.23	−58.18	18 32 44.47	+ 0.07
	28	B. A. C. 6395	P.	50.9	55.4	57.9	8.6	12.4	16.0	26.8	29.5	34.0	41 12.39	+ 0.21	. .	−58.18	18 40 14.42	− 1.77
	29	B. A. C. 6404	P.	57.3	0.7	2.6	10.8	13.4	16.0	24.3	26.4	29.9	43 13.49	− 0.01	. .	−58.18	18 42 15.30	− 2.02
	30	B. A. C. 6438	P.	. .	. .	. .	. .	. .	. .	5.6	7.3	10.0	47 56.89	− 0.19	. .	−58.18	18 46 58.52	− 2.32
	31	ζ Aquilæ.	P.	28.1	30.7	32.4	38.7	40.7	42.8	49.1	50.8	53.4	0 40.74	− 0.24	−58.14	−58.18	18 59 42.32	+ 0.04
	32	δ Aquilæ.	P.	0.6	3.3	4.9	10.9	13.0	15.0	21.0	22.6	25.1	20 12.93	− 0.30	−58.16	−58.19	19 19 14.44	+ 0.02
	33	Mural Zones 176, 77	P.	1.1	4.0	5.8	12.6	15.0	17.3	24.0	25.7	28.6	29 14.90	− 0.44	. .	−58.18	19 28 16.28	− 3.42
	34	Mural Zones 176, 78	P.	39.8	42.7	44.2	51.3	53.3	55.6	2.4	4.1	7.2	29 53.40	− 0.44	. .	−58.18	19 28 54.78	− 3.43
	35	XIX, 12	P.	53.8	56.7	58.4	5.0	7.2	9.4	16.0	17.6	20.5	41 7.18	− 0.42	. .	−58.18	19 40 8.58	− 3.35
	36	XIX, 13	P.	22.4	25.6	27.9	35.7	38.4	40.8	48.7	50.7	54.0	44 38.24	− 0.51	. .	−58.18	19 43 39.55	− 3.96
	37	B. A. C. 6817	P.	4.5	7.7	9.8	17.7	20.4	23.0	31.0	33.2	36.4	47 20.41	− 0.02	. .	−58.18	19 46 22.21	− 2.30
	38	B. A. C. 6857	P.	38.0	41.3	43.1	51.2	54.0	56.5	4.4	6.5	9.9	53 53.88	− 0.03	. .	−58.18	19 52 55.67	− 2.33
	39	B. A. C. 6948	P.	52.7	55.8	57.4	4.6	7.0	9.4	16.6	18.2	21.4	9 7.01	− 0.46	. .	−58.18	20 8 8.37	− 3.73
	40	XX, 5	P.	1.3	4.5	6.2	13.9	16.4	18.9	26.5	28.1	31.3	13 16.44	− 0.49	. .	−58.18	20 12 17.77	− 3.93
	41	B. A. C. 6998	P.	36.8	39.8	41.8	49.1	51.6	54.0	1.4	3.5	6.4	14 51.60	− 0.08	. .	−58.18	20 13 53.34	− 2.48
	42	B. A. C. 7149	P.	38.3	42.5	46.8	49.0	51.0	53.2	55.3	59.5	3.8	34 51.04	− 0.23	. .	−58.18	20 33 52.63	− 2.78
	43	B. A. C. 7175	P.	57.9	1.1	3.0	11.2	13.8	16.5	24.4	26.5	29.9	39 13.81	− 0.52	. .	−58.18	20 38 15.11	− 4.24
	44	B. A. C. 7215	P.	52.4	57.2	0.0	11.3	15.0	18.8	30.0	32.9	37.7	43 15.03	+ 0.24	. .	−58.18	20 42 17.09	− 2.39
	45	XX, 15	P.	35.7	38.5	40.2	47.0	49.3	51.6	58.1	0.0	3.0	44 49.27	− 0.44	. .	−58.18	20 43 50.65	− 3.69
	46	B. A. C. 7286	P.	13.0	16.4	18.0	26.0	28.6	31.5	39.6	41.4	44.9	55 28.82	− 0.52	. .	−58.18	20 54 30.12	− 4.26
	47	B. A. C. 7292	P.	48.7	50.7	56.3	58.6	1.4	4.2	6.9	11.9	13.8	56 1.39	− 0.52	. .	−58.18	20 55 2.69	− 4.26
	48	B. A. C. 7353	P.	49.6	53.1	55.2	3.0	5.7	8.6	16.4	18.3	21.8	6 5.74	− 0.52	. .	−58.18	21 5 7.04	− 4.33
	49	Anonymous	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .

9. Microscope III reduced for 15″.5.
18, 35, 47. Wire A used.
26, 33, 35, 46. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	69 58	10 9.1	3.5	14.0	12.0	32	420	426	. .	. .	. .	33.9	70 2 21.4	. .	+ 2 32.5	121 11 15.1	+ 3.6
2	54 28	12.0	8.6	21.9	13.4	32	074	. .	. .	. .	112	33.9	54 32 22.5	. .	+ 1 18.3	105 40 2.0	. .
3	54 28	12.0	8.6	21.9	13.4	31	. .	924	. .	932	. .	33.9	54 32 40.5	. .	+ 1 18.4	105 40 20.1	. .
4	47 4	7.6	4.7	15.4	8.7	37	622	632	. .	. .	. .	33.9	47 7 2.5	. .	+ 1 0.2	98 14 23.9	+ 2.4
5	69 4	8.3	4.7	15.7	10.2	33	. .	836	. .	840	. .	33.9	69 8 0.1	. .	+ 2 25.5	120 16 46.8	+ 1.2
6	24 18	3.4	1.7	11.9	4.8	38	. .	. .	. .	100	110	33.9	24 20 59.7	. .	+ 25.3	75 27 46.2	+ 2.7
7	27 10	8.0	5.7	17.5	11.5	36	045	. .	. .	. .	038	33.7	27 13 25.6	. .	+ 28.2	78 20 15.0	. .
8	27 10	8.0	5.7	17.5	11.5	35	. .	508	. .	458	. .	33.7	27 13 34.0	. .	+ 28.2	78 20 23.4	. .
9	30 16	5.7	2.8	20.5	6.9	30	. .	. .	. .	070	. .	33.7	30 20 59.7	. .	+ 32.2	81 27 53.1	. .
10	30 48	7.0	5.8	18.4	9.2	30	. .	825	. .	. .	. .	33.7	30 52 46.2	83.3	+ 32.8	81 59 40.2	. .
11	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
12	19 48	4.2	4.3	15.0	7.0	34	. .	. .	. .	358	388	33.7	19 51 54.6	. .	+ 19.8	70 58 35.6	+ 3.4
13	338 40	5.7	5.0	13.0	7.8	31	. .	. .	. .	400	420	32.5	338 44 39.2	. .	− 21.6	29 50 38.8	+ 8.5
14	7 58	8.0	8.1	18.6	10.7	35	200	190	. .	. .	. .	32.5	8 1 36.5	. .	+ 7.8	59 8 5.5	+ 5.0
15	350 10	7.1	5.5	14.5	8.9	33	. .	. .	. .	455	470	32.5	350 14 6.3	. .	− 9.6	41 20 17.9	+ 7.9
16	59 36	3.8	2.7	13.5	6.7	35	. .	995	. .	022	. .	32.5	59 39 28.6	. .	+ 1 34.5	110 47 24.3	− 9.8
17	351 10	8.7	8.5	17.8	12.0	32	565	560	. .	. .	. .	32.5	351 14 16.7	. .	− 8.6	42 20 29.3	+ 8.1
18	351 10	8.7	8.5	17.8	12.0	35	. .	. .	. .	600	. .	32.5	351 16 3.4	. .	− 8.5	42 22 16.1	+ 8.2
19	66 8	5.0	1.8	12.5	6.2	30	255	. .	. .	. .	288	32.5	66 12 56.5	. .	+ 2 5.4	117 21 23.1	. .
20	66 8	5.0	1.8	12.5	6.2	29	. .	208	. .	230	. .	32.5	66 13 12.8	. .	+ 2 5.4	117 21 39.4	. .
21	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
22	357 56	3.2	3.2	11.7	5.2	33	118	110	. .	. .	. .	32.5	358 0 14.0	. .	− 1.9	49 6 33.3	+ 8.3
23	17 56	5.2	4.5	14.8	8.0	28	. .	542	. .	. .	. .	32.5	18 1 21.5	. .	+ 18.1	69 8 0.8	+ 4.6
24	17 56	5.2	4.5	14.8	8.0	31	. .	. .	. .	690	. .	32.5	18 0 33.8	. .	+ 18.1	69 7 13.1	+ 4.6
25	17 56	5.2	4.5	14.8	8.0	37	. .	. .	. .	. .	295	32.5	17 59 8.2	. .	+ 18.0	69 5 47.4	+ 4.7
26	71 36	4.5	2.2	12.0	7.4	31	. .	. .	. .	345	. .	32.5	71 38 7.6	. .	+ 2 46.2	122 47 15.0	−10.2
27	0 10	10.8	9.5	20.2	15.0	35	975	960	. .	. .	. .	32.5	0 13 22.2	. .	+ 0.2	51 19 43.6	− 1.0
28	343 26	5.7	4.4	12.5	8.6	38	. .	015	. .	070	. .	32.5	343 28 56.9	. .	− 16.6	34 35 1.5	+10.4
29	357 32	9.5	9.1	19.5	13.3	37	. .	. .	. .	500	480	32.5	357 35 0.6	. .	− 2.4	48 41 19.4	+ 9.3
30	17 34	3.0	2.0	13.1	6.6	39	. .	. .	. .	240	262	32.5	17 36 40.1	. .	+ 17.7	68 43 19.0	+ 6.1
31	25 8	7.7	5.4	14.9	10.2	32	318	322	. .	. .	. .	32.5	25 12 22.1	. .	+ 26.3	76 19 9.6	+ 0.8
32	35 56	9.1	5.7	17.4	9.8	30	325	332	. .	. .	. .	32.5	36 0 51.6	. .	+ 40.7	87 7 53.5	+ 0.2
33	65 24	6.5	2.3	14.2	8.3	31	595	620	. .	. .	. .	32.5	65 26 1.4	. .	+ 2 1.9	116 34 24.5	− 3.2
34	65 24	6.5	2.3	14.2	8.3	36	. .	. .	. .	420	435	32.5	65 27 21.2	. .	+ 2 2.0	116 35 44.4	− 3.2
35	60 58	4,6	2.3	12.0	5.9	32	075	108	. .	. .	. .	32.5	60 59 55.6	. .	+ 1 40.8	112 7 57.6	− 1.0
36	77 28	7.7	4.3	11.5	8.3	31	230	290	. .	. .	. .	32.5	77 32 39.4	. .	+ 4 8.0	128 43 8.6	− 4.9
37	358 32	8.0	7.4	17.6	11.6	31	. .	675	. .	690	. .	32.5	358 36 30.8	. .	− 1.4	49 42 50.6	+11.0
38	358 48	8.3	7.7	17.8	10.0	35	655	632	. .	. .	. .	32.5	358 51 30.1	70.9	− 1.1	49 57 50.2	+11.2
39	69 10	10.6	7.7	17.7	12.4	32	485	495	. .	. .	. .	32.5	69 14 16.6	. .	+ 2 27.0	120 23 4.8	− 0.3
40	73 46	8.2	4.3	13.8	8.7	38	186	163	. .	. .	. .	32.5	73 48 52.8	. .	+ 3 10.8	124 58 24.8	− 1.0
41	4 14	10.1	9.9	20.4	14.2	34	. .	355	. .	375	. .	32.5	4 17 47.2	. .	+ 4.2	55 24 12.6	+11.4
42	23 20	10.2	8.3	20.5	12.3	30	690	705	. .	. .	. .	32.5	23 24 42.7	. .	+ 24.3	74 31 28.2	+10.2
43	78 24	7.0	4.8	12.6	8.4	32	. .	910	. .	955	. .	32.5	78 28 14.0	. .	+ 4 28.1	129 39 3.3	+ 0.9
44	341 42	8.4	6.1	14.8	9.6	34	390	370	. .	. .	. .	32.5	341 45 51.1	. .	− 18.5	32 51 53.8	+12.4
45	64 50	7.8	4.6	15.0	10.2	32	. .	. .	. .	132	158	32.5	64 54 25.2	. .	+ 1 59.5	116 2 45.9	+ 4.2
46	77 50	9.1	6.0	14.2	10.7	38	455	495	. .	. .	. .	32.5	77 50 13.9	. .	+ 4 14.6	129 0 49.7	+ 2.9
47	77 50	9.1	6.0	14.2	10.7	34	. .	. .	. .	335	360	32.5	77 56 23.6	. .	+ 4 16.7	129 7 1.5	+ 3.0
48	78 40	10.7	6.4	15.2	11.9	29	830	800	. .	. .	. .	32.5	78 44 58.4	. .	+ 4 34.8	129 55 54.4	+ 4.0
49	61 6	7.4	4.6	15.3	10.1	25	. .	. .	. .	. .	925	32.5	61 12 0.5	. .	+ 1 42.1	112 20 3.8	+ 7.2

No.	Barom.	At. Ther.
	in.	°
10	30.19	81.5
38	30.14	71.7

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
2	− 0.8	+ 9.0	. .	+ 8.2
3	− 0.8	− 9.1	. .	− 9.9
7	− 2.3	+ 4.2	. .	+ 1.9
8	− 2.3	− 4.2	. .	− 6.5
9	− 4.4	+ 15 53.5	. .	+ 15 49.1
10	− 4.5	− 15 53.5	. .	− 15 58.0
19	− 12.3	+ 8.1	. .	− 4.2
20	− 12.3	− 8.2	. .	− 20.5

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII	VIII	IX.	Mean wire.	Inst.	Clock appar'nt	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Sept. 1	1	Transit Zones 176, 4	P.	42.0	45.0	46.6	53.3	55.7	57.9	4.6	6.2	8.8	8 55.57	− 0.42	. .	−58.18	21 7 56.97	− 3.63
	2	β Aquarii. . . .	P.	48.0	50.7	52.3	58.3	0.4	2.4	8.5	10.1	12.6	26 0.37	− 0.34	−58.10	−58.22	21 25 1.81	− 0.09
	3	B. A. C. 7502 . .	P.	6.1	9.1	11.0	18.3	20.8	23.4	30.8	32.5	35.5	30 20.83	− 0.48	. .	−58.18	21 29 22.17	− 4.06
	4	Saturn I, N. . .	P.	2.3	5.0	6.6	. .	. .	. .	23.3	24.9	27.6	38 14.95	− 0.39	. .	−58.18	21 37 16.38	. .
	5	Saturn II, S. . .	P.	. .	. .	12.0	14.2	16.3	18.4	20.5	. .	. .	38 16.28	− 0.39	. .	−58.18	21 37 17.71	. .
2	6	α Leonis	F.	30.6	33.2	34.7	39.0	43.1	47.4	51.5	53.0	55.8	2 43.14	− 0.11	−59.36	−59.25	10 1 43.78	+ 0.07
	7	γ^1 Leonis	F.	52.0	54.7	56.4	3.0	5.1	7.3	13.8	15.3	18.2	14 5.09	− 0.08	−59.36	−59.26	10 13 5.75	+ 0.08
	8	Venus I, N. . .	F.	. .	. .	0.8	2.6	4.9	6.9	9.0	. .	. .	32 4.84	− 0.11	. .	−59.36	10 31 5.37	+ 0.33
	9	Venus II, S. . .	F.	53.0	. .	57.2	. .	. .	. .	13.9	15.4	18.0	32 5.51	− 0.11	. .	−59.36	10 31 6.04	− 0.34
3	10	Sun, S.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	11	Sun, N.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	12	Mercury I, C. . .	F.	46.0	48.6	50.0	56.2	58.3	0.5	6.6	8.0	10.6	32 58.31	− 0.13	. .	−59.37	11 31 58.81	+ 0.17
	13	β Leonis	F.	28.6	31.4	32.9	39.2	41.3	43.4	49.8	51.4	53.9	43 41.32	− 0.10	−59.42	−59.30	11 42 41.92	+ 0.10
	14	γ Ursæ Majoris . .	F.	53.9	58.4	0.9	11.5	15.0	18.6	29.2	31.5	35.9	48 14.99	+ 0.14	. .	−59.30	11 47 15.80	+ 0.13
	15	Polaris, S. P. . .	F.	. .	. .	36.0	10.0	43.0	16.0	44.0	. .	. .	14 41.80	−12.51	. .	−59.33	1 13 29.96	+ 0.62
	16	α Virginis . . .	F.	. .	. .	. .	. .	39.1	41.2	45.4	46.9	49.5	19 37.06	− 0.15	−59.43	−59.33	13 18 37.58	+ 0.08
	17	α Cygni	F.	55.0	58.5	0.7	9.3	12.2	15.1	23.6	25.7	29.4	38 12.17	− 0.10	−59.39	−59.51	20 37 12.56	− 0.10
	18	B. A. C. 7215 . .	F.	58.9	1.7	9.3	13.0	16.8	20.6	24.4	31.8	34.6	43 16.79	0.00	. .	−59.43	20 42 17.36	− 2.35
	19	B. A. C. 7237 . .	F.	31.0	33.8	35.4	42.2	44.4	46.8	53.4	55.1	58.0	46 44.46	− 0.23	. .	−59.43	20 45 44.80	− 3.63
	20	B. A. C. 7280 . .	F.	. .	36.2	38.5	40.8	43.2	45.7	50.5	52.2	55.4	54 40.85	− 0.23	. .	−59.44	20 53 41.18	− 3.96
	21	B. A. C. 7316 . .	F.	17.5	20.3	22.1	29.2	31.7	34.0	41.0	42.9	45.8	59 31.61	− 0.23	. .	−59.44	20 58 31.94	− 3.89
	22	B. A. C. 7353 . .	F.	. .	. .	1.4	4.1	6.7	9.4	12.0	. .	. .	6 6.72	− 0.22	. .	−59.44	21 5 7.06	− 4.32
	23	ζ Cygni	F.	. .	. .	. .	39.3	41.8	44.0	48.7	50.4	53.4	8 39.30	− 0.16	−59.46	−59.52	21 7 39.62	− 0.05
	24	ι Draconis, S. P. .	F.	. .	. .	36.7	21.8	6.9	52.6	38.1	. .	. .	20 7.22	− 1.86	. .	−59.53	9 19 5.83	− 0.85
	25	B. A. C. 7458 . .	F.	24.7	27.7	29.5	36.6	39.2	41.4	48.7	50.4	53.5	22 39.08	− 0.23	. .	−59.45	21 21 39.40	− 3.98
	26	β Aquarii. . . .	F.	49.3	52.0	53.5	59.6	1.6	3.6	9.9	11.3	13.9	26 1.63	− 0.23	−59.47	−59.52	21 25 1.88	− 0.02
	27	Saturn I, N. . .	F.	31.0	33.7	35.2	. .	. .	. .	52.1	53.8	56.5	37 43.72	− 0.23	. .	−59.46	21 36 44.03	. .
	28	Saturn II, S. . .	F.	. .	. .	40.9	42.9	45.1	47.1	49.2	. .	. .	37 45.04	− 0.23	. .	−59.46	21 36 45.35	. .
	29	XXI, 16 . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	30	Weisse 604. . .	F.	59.3	2.0	3.5	9.8	11.8	14.0	20.3	21.7	24.4	31 11.87	− 0.23	. .	−59.49	22 30 12.15	− 3.44
	31	Weisse 22^1. . .	F.	27.6	30.2	31.7	. .	. .	. .	48.4	49.8	52.6	4 40.05	− 0.23	. .	−59.50	23 3 40.32	− 3.34
	32	Weisse 22^2. . .	F.	. .	. .	36.1	38.2	40.3	42.3	44.5	. .	. .	4 40.28	− 0.23	. .	−59.50	23 3 40.55	− 3.34
	33	Weisse 103 . .	F.	. .	. .	. .	36.0	38.0	40.0	. .	. .	. .	8 35.92	− 0.23	. .	−59.50	23 7 36.19	− 3.35
	34	Weisse 104 . .	F.	. .	. .	. .	. .	. .	. .	44.4	45.9	48.5	8 36.07	− 0.23	. .	−59.50	23 7 36.34	− 3.35
	35	Weisse 109 . .	F.	. .	. .	. .	. .	. .	. .	52.8	54.3	57.0	8 44.51	− 0.23	. .	−59.50	23 7 44.78	− 3.35
	36	Niobe	F.	25.4	28.1	29.7	36.3	38.5	40.7	47.1	48.6	51.1	22 38.39	− 0.19	. .	−59.51	23 21 38.69	. .
	37	B. A. C. 8309 . .	F.	52.7	56.1	58.0	6.2	8.9	11.8	19.7	21.8	25.3	49 8.94	− 0.22	. .	−59.52	23 48 9.20	− 4.12
	38	B. A. C. 8352 . .	F.	47.6	49.4	54.0	56.3	58.6	1.1	3.6	8.4	10.0	56 58.78	− 0.23	. .	−59.53	23 55 59.02	− 3.70
	39	B. A. C. 8357 . .	F.	. .	. .	. .	. .	. .	. .	15.6	17.3	20.8	58 5.35	− 0.23	. .	−59.53	23 57 5.59	− 3.91
	40	Eurydice . . .	F.	. .	. .	. .	. .	. .	. .	49.7	51.2	53.9	5 41.55	− 0.22	. .	−59.53	0 4 41.80	. .
	41	Metis	F.	53.7	56.2	57.8	3.9	6.0	8.1	14.3	15.9	18.4	19 6.03	− 0.20	. .	−59.54	0 18 6.29	. .
	42	B. A. C. 144 . .	F.	21.3	24.9	27.0	34.7	37.4	39.8	47.8	49.6	52.9	29 37.27	− 0.23	. .	−59.54	0 28 37.50	− 3.79
	43	β Ceti. . . .	F.	9.1	11.8	13.4	19.8	21.9	24.0	30.6	32.0	34.9	38 21.94	− 0.23	−59.57	−59.61	0 37 22.10	+ 0.01
	44	ε Piscium . . .	F.	17.7	20.3	21.8	28.0	30.2	32.2	38.3	39.9	42.5	57 30.10	− 0.21	−59.51	−59.62	0 56 30.27	− 0.09
	45	Polaris	F.	. .	. .	28.0	54.0	21.0	50.0	16.0	. .	. .	14 21.80	+ 8.51	. .	−59.62	1 13 30.69	+ 1.04
	46	θ^1 Ceti	F.	. .	45.5	47.3	49.3	51.4	53.4	57.6	59.0	1.7	18 49.34	− 0.23	−59.59	−59.62	1 17 49.49	− 0.01
	47	α Hydræ	P.	14.8	17.5	19.0	25.4	27.4	29.5	35.6	37.2	39.8	22 27.36	− 0.19	−59.90	−59.84	9 21 27.33	+ 0.03
	48	ε Leonis	P.	32.8	35.5	37.2	43.9	46.2	48.5	55.0	56.7	59.6	39 46.16	− 0.12	−59.82	−59.84	9 38 46.20	− 0.08
	49	γ^1 Leonis	P.	52.6	55.3	57.0	. .	. .	. .	. .	. .	. .	14 5.69	− 0.13	−59.90	−59.84	10 13 5.72	+ 0.04

10. Telescope micrometer reading decreased one revolution in reduction.
24. Bisections reduced for set D.
33, 34, 35, 36, 40, 41. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	61 6	10 7.4	4.6	15.3	10.1	27	. .	090	. .	125	. .	32.5	61 11 42.2	. .	+ 1 42.1	112 19 45.5	+ 7.3
2	44 56	8.1	5.8	15.9	9.5	34	845	865	. .	. .	. .	32.5	44 59 42.9	. .	+ 56.2	96 7 0.3	+ 0.5
3	72 24	7.8	3.1	13.0	9.4	38	048	070	. .	. .	. .	32.5	72 26 55.0	. .	+ 2 55.9	123 36 12.1	+ 7.8
4	54 30	8.6	4.8	16.3	10.4	34	805	. .	. .	. .	850	32.5	54 33 43.3	. .	+ 1 18.9	105 41 23.4	. .
5	54 30	8.6	4.8	16.3	10.4	33	. .	705	. .	738	. .	32.5	54 34 0.3	69.1	+ 1 18.9	105 41 40.4	. .
6	26 14	9.9	6.9	16.6	13.6	31	. .	298	. .	388	. .	32.3	26 18 35.0	. .	+ 26.9	77 25 23.1	+ 3.1
7	18 20	6.8	4.5	21.2	11.7	29	616	. .	. .	. .	614	32.3	18 25 2.3	86.0	+ 18.1	69 31 41.6	+ 5.1
8	28 2	6.4	5.7	18.1	9.4	32	. .	198	. .	158	. .	32.3	28 6 24.0	. .	+ 29.0	79 13 14.2	. .
9	28 2	6.4	5.7	18.1	9.4	31	548	. .	. .	. .	604	32.3	28 6 33.3	. .	+ 29.0	79 13 23.5	. .
10	31 32	16.1	14.0	26.4	18.7	31	842	836	. .	. .	. .	32.3	31 36 35.7	86.8	+ 33.3	82 43 30.2	. .
11	31 0	9.5	8.2	20.1	11.5	30	. .	. .	. .	350	362	32.3	31 4 49.4	. .	+ 32.7	82 11 43.3	. .
12	34 42	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
13	23 32	17.4	15.9	28.3	21.2	28	. .	. .	. .	930	934	32.3	23 37 3.3	. .	+ 23.7	74 43 48.2	+ 0.9
14	344 26	7.2	6.3	15.9	10.3	31	. .	. .	. .	490	500	32.3	344 30 35.5	. .	− 15.0	35 36 41.7	+ 1.7
15	307 30	7.8	7.3	16.1	14.4	35	896	. .	996	. .	896	32.3	307 33 24.8	. .	− 1 10.1	358 38 35.9	− 1.1
16	49 18	3.2	3.9	13.5	6.2	29	. .	. .	. .	196	. .	32.3	49 23 13.0	88.6	+ 1 2.8	100 30 37.0	− 1.4
17	354 0	10.0	9.9	20.2	12.7	35	. .	796	. .	788	. .	35.0	354 3 28.4	. .	− 5.7	45 9 43.9	+ 1.0
18	341 42	9.9	9.4	17.2	9.7	34	. .	. .	. .	416	420	35.0	341 45 51.9	. .	− 18.1	32 51 55.0	+13.0
19	63 4	9.5	7.0	17.5	9.4	38	606	602	. .	. .	. .	35.0	63 6 46.8	. .	+ 1 47.9	114 14 55.9	+ 4.6
20	71 32	10.1	6.6	15.8	7.9	35	. .	. .	. .	720	730	35.0	71 35 32.2	. .	+ 2 43.6	122 44 37.0	+ 3.8
21	69 24	11.1	9.0	20.3	13.5	32	342	350	. .	. .	. .	35.0	69 28 19.9	76.5	+ 2 25.7	120 37 6.8	+ 4.7
22	78 40	11.1	8.9	15.8	10.8	29	. .	630	. .	626	. .	35.0	78 45 3.7	. .	+ 4 28.9	129 55 53.8	+ 3.7
23	9 6	10.6	9.1	21.0	12.1	32	. .	. .	. .	246	254	35.0	9 10 23.0	. .	+ 8.9	60 16 53.1	+ 1.2
24	300 44	8.9	7.4	14.7	11.0	35	. .	. .	. .	280	302	35.0	300 47 37.9	. .	− 1 32.3	351 52 26.8	+ 1.8
25	70 34	8.6	5.9	15.8	10.0	34	. .	390	. .	444	. .	35.0	70 37 52.1	. .	+ 2 35.6	121 46 48.9	+ 7.0
26	44 56	14.9	12.9	24.5	15.0	34	. .	. .	. .	442	446	35.0	44 59 45.4	. .	+ 55.2	96 7 1.8	+ 2.1
27	54 32	12.3	9.9	20.2	12.1	31	790	. .	. .	. .	836	35.0	54 36 28.4	. .	+ 1 17.7	105 44 7.3	. .
28	54 32	12.3	9.9	20.2	12.1	30	. .	660	. .	654	. .	35.0	54 36 46.2	. .	+ 1 17.8	105 44 25.2	. .
29	61 56	16.7	14.5	26.2	20.6	33	. .	. .	. .	734	736	35.0	61 59 53.2	75.4	+ 1 43.6	113 7 58.0	+10.0
30	51 50	13.0	10.6	20.4	12.4	33	828	834	. .	. .	. .	35.0	51 53 56.8	75.0	+ 1 10.5	103 1 28.5	+15.4
31	47 34	10.2	8.5	19.7	10.5	37	. .	. .	. .	296	. .	35.0	47 37 6.2	. .	+ 1 0.6	98 44 28.0	+17.9
32	47 34	10.2	8.5	19.7	10.5	37	. .	. .	. .	. .	494	35.0	47 37 3.3	. .	+ 1 0.6	98 44 25.1	+17.9
33	48 24	10.1	7.4	17.4	9.3	40	. .	. .	. .	. .	060	35.0	48 28 30.8	. .	+ 1 2.4	99 35 54.4	+18.2
34	48 24	10.1	7.4	17.4	9.3	41	. .	. .	. .	. .	834	35.0	48 28 58.0	. .	+ 1 2.4	99 36 21.6	+18.2
35	48 24	10.1	7.4	17.4	9.3	38	. .	. .	. .	. .	386	35.0	48 29 23.6	. .	+ 1 2.4	99 36 47.2	+18.2
36	20 0	11.0	10.2	22.6	13.0	41	. .	444	. .	448	. .	35.0	20 4 33.5	. .	+ 20.2	71 11 14.9	− 1.4
37	79 44	11.1	8.6	16.6	10.3	32	. .	990	. .	964	. .	35.0	79 48 12.4	74.5	+ 4 56.5	130 59 30.1	+21.7
38	69 12	13.9	12.0	21.7	15.2	34	. .	. .	. .	138	134	35.0	69 15 51.0	. .	+ 2 24.7	120 24 36.9	+22.3
39	75 44	12.8	8.4	17.8	10.6	39	. .	. .	. .	282	314	35.0	75 46 35.1	. .	+ 3 34.0	126 56 30.3	+22.5
40	40 12	14.0	12.5	24.4	15.4	36	. .	. .	. .	884	954	35.0	40 17 40.6	. .	+ 46.8	91 24 48.6	− 6.4
41	47 6	10.5	8.7	18.3	10.5	39	.	678	. .	674	. .	35.0	47 11 2.7	. .	+ 59.6	98 18 23.5	− 4.9
42	77 26	14.7	5.9	14.9	8.0	32	. .	. .	. .	748	744	35.0	77 30 17.0	. .	+ 4 3.5	128 40 41.7	+25.2
43	57 28	8.1	6.0	17.5	8.8	33	052	054	. .	. .	. .	35.0	57 32 12.6	. .	+ 1 26.7	108 40 0.5	+ 2.3
44	31 36	11.0	10.2	20.7	12.2	34	. .	. .	. .	700	706	35.0	31 39 44.8	. .	+ 34.1	82 46 40.1	+ 1.5
45	310 12	15.7	15.6	25.3	20.0	32	866	862	856	840	838	35.0	310 16 7.3	73.5	− 1 5.2	1 21 23.3	+ 0.5
46	47 38	13.2	13.0	22.0	14.2	33	. .	. .	. .	620	612	35.0	47 41 59.2	. .	+ 1 0.7	98 49 21.1	+ 2.6
47	46 56	11.2	9.0	19.0	13.7	34	848	845	. .	. .	. .	33.9	46 59 41.0	83.9	+ 58.1	98 7 0.3	+ 1.7
48	14 28	8.4	9.0	20.6	12.5	31	710	700	. .	. .	. .	33.9	14 32 30.0	. .	+ 14.1	65 39 5.3	+ 1.6
49	18 20	8.4	8.1	20.8	12.2	29	670	685	. .	. .	. .	33.9	18 25 1.2	. .	+ 18.0	69 31 40.4	+ 3.7

No.	Barom.	At Ther.
	in.	°
5	30.14	71.0
7	30.00	82.3
10	29.99	84.2
16	29.97	87.5
21	29.90	78.0
29	29.98	77.5
30	29.98	77.0
37	29.88	76.5
45	29.84	75.0
47	29.87	81.8

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
4	− 0.8	+ 8.5	. .	+ 7.7
5	− 0.8	− 8.5	. .	− 9.3
8	− 2.4	+ 4.7	. .	+ 2.3
9	− 2.4	− 4.6	. .	− 7.0
10	− 4.6	− 15 53.4	. .	− 15 58.0
11	− 4.5	+ 15 53.4	. .	+ 15 48.9
27	− 0.8	+ 8.9	. .	+ 8.1
28	− 0.8	− 9.0	. .	− 9.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Sept. 3	1	Venus I, N. . .	P.	35.4	38.0	39.6	. .	. .	. .	56.1	57.8	0.3	36 47.87	− 0.16	. .	−59.87	10 35 47.84	+ 0.31
	2	Venus II, S. . .	P.	. .	. .	44.4	46.4	48.4	50.4	52.7	. .	. .	36 48.50	− 0.16	. .	−59.87	10 35 48.47	− 0.32
4	3	Sun I, N. . . .	P.	17.3	19.9	21.5	27.6	29.8	31.8	38.0	39.5	42.1	52 29.72	− 0.17	. .	−59.87	10 51 29.68	. .
	4	Sun II, S. . . .	P.	. .	. .	. .	. .	. .	. .	46.2	47.6	50.3	54 37.92	− 0.17	. .	−59.87	10 53 37.88	. .
	5	Mercury, C. . .	P.	57.9	0.4	2.0	8.0	10.2	12.2	18.3	20.0	22.4	39 10.16	− 0.18	. .	−59.87	11 38 10.11	+ 0.01
	6	12 Canum Venat. .	P.	55.8	59.0	1.0	9.0	11.4	14.1	22.1	24.0	27.2	51 11.51	− 0.05	−59.87	−59.87	12 50 11.59	0.00
	7	Polaris, S. P. . .	P.	. .	. .	31.0	6.0	. .	12.5	43.0	. .	. .	14 38.10	−11.27	. .	−59.88	1 13 26.95	− 3.03
	8	α Virginis . . .	P.	25.1	27.8	29.3	35.5	37.6	39.6	45.9	47.4	50.0	19 37.58	− 0.20	−59.91	−59.88	13 18 37.50	+ 0.01
	9	ζ Virginis . . .	P.	8.3	10.8	12.4	18.5	20.5	22.6	28.7	30.1	32.8	29 20.52	− 0.18	−59.86	−59.88	13 28 20.46	− 0.02
	10	η Ursæ Majoris . .	P.	18.5	22.5	24.9	34.3	37.6	40.9	50.2	52.6	56.5	43 37.56	+ 0.03	. .	−59.88	13 42 37.71	+ 0.06
	11	η Bootis	P.	32.0	34.8	36.3	42.9	45.0	47.2	53.6	55.3	58.1	49 45.02	− 0.14	−59.82	−59.88	13 48 45.00	− 0.11
	12	Moon I, N. . .	P.	4.7	7.3	9.0	15.8	17.9	20.0	26.6	28.2	31.0	21 17.83	− 0.20	. .	−59.86	14 20 17.77	+64.42
	13	α Lyræ	P.	28.6	31.9	33.7	41.7	44.4	46.9	54.6	56.6	59.9	33 44.26	− 0.08	−59.83	−59.92	18 32 44.26	− 0.07
	14	51 Cephei, S. P. .	P.	. .	. .	54.0	11.5	29.0	46.0	4.5	. .	. .	42 29.00	− 5.48	. .	−59.93	6 41 23.59	+ 0.77
	15	ζ Aquilæ	P.	29.7	32.4	34.0	40.2	42.3	44.4	50.8	52.4	54.9	0 42.34	− 0.17	−59.85	−59.93	18 59 42.24	0.00
	16	B. A. C. 6721 . .	P.	50.5	54.3	56.4	5.7	8.7	11.7	20.8	23.1	26.9	32 8.68	− 0.02	. .	−59.86	19 31 8.80	− 2.08
	17	XIX, 12 . . .	P.	55.5	58.2	59.9	6.4	8.7	11.3	17.5	19.2	22.0	41 8.71	− 0.24	. .	−59.86	19 40 8.65	− 3.32
	18	B. A. C. 6817 . .	P.	6.2	9.5	11.6	19.6	22.2	24.9	32.9	34.9	38.3	47 22.23	− 0.07	. .	−59.87	19 46 22.29	− 2.26
	19	XIX, 15 . . .	P.	6.3	9.2	11.1	18.0	20.2	22.5	29.4	31.2	34.0	50 20.21	− 0.24	. .	−59.87	19 49 20.10	− 3.52
	20	B. A. C. 6849 . .	P.	10.5	13.7	15.6	23.3	26.0	28.7	36.4	38.4	41.6	52 26.02	− 0.08	. .	−59.87	19 51 26.07	− 2.30
	21	B. A. C. 6886 . .	P.	23.0	26.0	27.8	35.2	37.4	39.9	47.4	49.0	52.2	58 37.54	− 0.25	. .	−59.87	19 57 37.42	− 3.77
	22	B. A. C. 6922 . .	P.	47.6	51.1	53.3	0.6	3.0	5.6	13.2	15.2	18.4	4 3.11	− 0.25	. .	−59.88	20 3 2.98	− 3.92
	23	B. A. C. 6977 . .	P.	29.6	32.6	34.2	41.4	43.7	46.0	53.2	54.9	57.9	12 43.72	− 0.24	. .	−59.88	20 11 43.60	− 3.71
	24	B. A. C. 7025 . .	P.	35.4	38.7	40.6	48.3	51.0	53.6	1.5	3.4	6.5	19 51.00	− 0.25	. .	−59.88	20 18 50.87	− 4.06
	25	O. Arg. S. 20578 .	P.	42.7	45.5	47.2	54.0	56.1	58.4	5.2	6.8	9.7	25 56.18	− 0.24	. .	−59.88	20 24 56.06	− 3.60
	26	O. Arg. S. 20601 .	P.	15.0	17.7	19.4	25.9	28.4	30.6	37.3	39.0	42.0	27 28.37	− 0.24	. .	−59.88	20 26 28.25	− 3.59
	27	B. A. C. 7155 . .	P.	30.0	33.2	35.4	43.3	46.1	48.7	56.7	58.6	1.9	35 45.99	− 0.25	. .	−59.89	20 34 45.85	− 4.23
	28	B. A. C. 7215 . .	P.	54.5	59.3	2.1	13.3	17.1	20.9	32.1	35.0	39.7	43 17.11	+ 0.08	. .	−59.89	20 42 17.30	− 2.33
	29	B. A. C. 7237 . .	P.	31.6	34.3	36.0	42.7	44.8	47.3	52.9	55.6	58.5	46 44.97	− 0.24	. .	−59.89	20 45 44.84	− 3.63
	30	B. A. C. 7280 . .	P.	26.9	29.8	31.6	38.8	41.3	43.8	51.0	52.8	56.0	54 41.33	− 0.25	. .	−59.90	20 53 41.18	− 3.95
	31	B. A. C. 7316 . .	P.	17.9	21.0	22.6	29.7	32.2	34.6	41.7	43.3	46.4	59 32.16	− 0.24	. .	−59.90	20 58 32.02	− 3.88
	32	B. A. C. 7353 . .	P.	51.4	54.8	56.6	4.6	7.4	10.0	18.0	19.9	23.3	6 7.33	− 0.25	. .	−59.90	21 5 7.18	− 4.32
	33	Anonymous . .	P.	32.3	34.9	36.6	41.2	43.3	45.4	47.8	50.0	. .	8 45.51	− 0.24	. .	−59.90	21 7 45.37	− 3.62
	34	Transit Zones 176,4	P.	. .	52.7	55.0	57.2	59.5	1.7	6.0	7.6	10.6	8 57.22	− 0.24	. .	−59.90	21 7 57.08	− 3.62
	35	B. A. C. 7458 . .	P.	25.4	28.2	29.9	37.2	39.6	41.9	49.0	50.9	54.0	22 39.57	− 0.25	. .	−59.91	21 21 39.41	− 3.97
	36	B. A. C. 7475 . .	P.	30.2	33.0	34.9	42.5	45.0	47.5	54.9	56.8	0.0	25 44.98	− 0.25	. .	−59.91	21 24 44.82	− 4.09
	37	B. A. C. 7502 . .	P.	7.7	10.9	12.6	20.0	22.4	24.9	32.3	34.0	37.3	30 22.46	− 0.25	. .	−59.91	21 29 22.30	− 4.06
	38	Saturn I, N. . .	P.	15.7	18.2	19.8	. .	. .	. .	36.8	38.4	41.0	37 28.32	− 0.23	. .	−59.91	21 36 28.18	. .
	39	Saturn II, S. . .	P.	. .	. .	25.4	27.5	29.6	31.8	33.9	. .	. .	37 29.64	− 0.23	. .	−59.91	21 36 29.50	. .
	40	XXI, 16	P.	. .	0.3	2.5	4.7	6.9	9.1	13.6	15.3	18.1	39 4.72	− 0.24	. .	−59.91	21 38 4.57	− 3.69
	41	ι Piscium . . .	P.	22.4	25.0	26.5	32.6	34.6	36.7	42.7	44.3	47.0	34 34.64	− 0.19	−59.98	−59.97	23 33 34.48	+ 0.01
	42	Anonymous . .	P.	15.5	18.0	19.7	25.8	27.9	30.0	36.2	37.7	40.3	42 27.90	− 0.21	. .	−59.97	23 41 27.72	− 3.24
	43	Groombridge 4163	P.	6.0	15.1	20.6	42.6	49.8	57.0	18.9	24.5	33.3	49 49.76	+ 0.52	. .	−59.97	23 48 50.31	+ 0.01
	44	Weisse 1114 . .	P.	16.4	18.9	20.4	26.4	28.5	30.6	36.7	38.3	40.8	56 28.56	− 0.21	. .	−59.98	23 55 28.37	− 3.19
	45	α Andromedæ . .	P.	45.0	47.8	49.6	56.6	58.9	1.1	8.1	9.7	12.9	2 58.86	− 0.13	−60.01	−59.98	0 1 58.75	+ 0.05
	46	Eurydice . . .	P.	48.8	51.8	53.4	. .	. .	. .	9.6	11.1	13.7	5 1.40	− 0.21	. .	−59.98	0 4 1.21	. .
	47	Metis	P.	11.2	14.0	15.5	21.6	23.8	25.8	32.0	33.5	36.1	18 23.72	− 0.22	. .	−59.99	0 17 23.51	. .
	48	B. A. C. 144 . .	P.	22.3	25.5	27.4	35.3	38.0	40.6	48.3	50.2	53.5	29 37.90	− 0.25	. .	−59.99	0 28 37.66	− 3.81
	49	B. A. C. 166 . .	P.	27.8	30.8	32.4	39.4	41.9	44.3	51.3	53.1	56.1	33 41.90	− 0.12	. .	−60.00	0 32 41.78	− 2.95

12. Bisections at wires III–VI.
17, 44. Wire B used.
46, 47. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° '	r. ''	''	''	''							''	° ' ''	°	' ''	° ' ''	''
1	28 30	10 10.9	8.2	21.5	16.5	36	005	. .	. .	. .	965	33.9	28 33 23.0	. .	+ 29.4	79 40 13.6	. .
2	28 30	10.9	8.2	21.5	16.5	35	. .	390	. .	355	. .	33.9	28 33 32.3	. .	+ 29.4	79 40 22.9	. .
3	31 22	5.7	2.7	13.2	5.5	30	340	275	. .	. .	. .	33.9	31 26 57.5	. .	+ 33.3	82 33 52.0	. .
4	31 54	12.2	8.0	21.5	14.9	30	. .	. .	. .	695	670	33.9	31 58 44.2	86.2	+ 33.7	83 5 39.1	. .
5	35 30	10.4	7.6	19.7	11.0	35	625	. .	. .	. .	445	33.9	35 33 31.9	. .	+ 38.5	86 40 31.6	. .
6	359 50	9.4	10.8	22.3	13.0	33	300	320	. .	395	370	33.9	359 54 4.1	. .	− 0.1	41 0 25.2	+ 1.5
7	307 30	9.4	9.7	18.9	17.0	35	835	820	. .	825	800	33.9	307 33 25.7	. .	− 1 9.7	358 38 37.2	− 0.2
8	49 18	8.8	8.7	18.7	10 2	28	730	770	. .	770	805	33.9	49 23 16.0	. .	+ 1 2.5	100 30 39.7	+ 1.3
9	38 46	9.4	8.5	19.4	11.2	31	. .	. .	. .	945	985	33.9	38 50 26.9	89 2	+ 43.2	89 57 31.3	+ 3.0
10	348 54	8.5	9.2	18.2	13.3	35	408	365	. .	380	412	33.9	348 57 34.6	. .	− 10.5	40 3 45.3	+ 0.9
11	19 48	9.3	10.2	21.2	11.3	33	960	975	. .	995	020	33.9	19 51 54.9	. .	+ 19.4	70 58 35.5	+ 3.1
12	56 10	10.8	10.3	21.3	13.6	31	. .	230	943	735	560	33.9	56 14 41.0	. .	+ 1 19.9	107 22 22.1	. .
13	0 10	12.2	12.3	22.8	15.0	35	910	900	. .	908	118	35.3	0 13 23.8	. .	+ 0.2	51 19 45.2	+ 1.0
14	306 6	11.5	10.3	17.9	14.1	38	170	178	195	180	190	35.3	306 8 51.4	. .	− 1 15.0	357 13 57.6	+ 2.2
15	25 8	10.9	9.3	21.4	12.4	32	085	085	. .	115	125	35.3	25 12 24.6	77.5	+ 25.9	76 19 11.7	+ 3.2
16	350 56	10.1	9.5	17.1	11.5	33	. .	490	. .	510	. .	35.3	351 0 5.0	. .	− 8.7	42 6 17.5	+11.8
17	60 58	8.6	6.5	16.8	9.8	31	770	780	. .	. .	. .	35.3	60 59 59.1	. .	+ 1 39.1	112 7 59.4	− 1.1
18	358 32	12.6	12.0	22.8	15.3	31	460	455	. .	. .	. .	35.3	358 36 32.3	. .	− 1.3	49 42 52.2	+11.6
19	66 18	8.5	6.4	16.1	8.7	35	525	524	. .	. .	. .	35.3	66 21 35.1	. .	+ 2 5.1	117 30 1.4	− 1.7
20	0 40	11.4	11.1	21.5	13.3	33	. .	110	. .	140	. .	35.3	0 44 8.3	. .	+ 0.7	51 50 30.2	+11.6
21	72 8	9.6	6.5	16.0	11.0	33	828	830	. .	. .	. .	35.3	72 12 0.1	. .	+ 2 49.7	123 21 11.0	− 2.4
22	75 10	13.5	10.4	19.9	16.5	29	072	085	. .	. .	. .	35.3	75 15 8.6	. .	+ 3 26.0	126 24 55.8	− 2.6
23	68 48	11.5	8.4	19.4	12.2	33	610	625	. .	. .	. .	35.3	68 52 1.3	. .	+ 2 21.7	120 0 44.2	− 0.1
24	76 34	10.8	7.6	15.8	11.5	33	100	135	. .	. .	. .	35.3	76 38 10.3	. .	+ 3 47.6	127 48 19.1	− 1.2
25	64 4	7.6	5.2	15.8	9.6	29	285	280	. .	. .	. .	35.3	64 9 11.1	. .	+ 1 53.6	115 17 25.9	+ 2.3
26	63 54	11.9	8.0	18.7	13.6	38	. .	. .	. .	682	705	35.3	63 56 44.1	. .	+ 1 52.5	115 4 57.8	+ 2.5
27	78 46	9.6	7.2	15.6	10.0	36	225	242	. .	. .	. .	35.3	78 49 23.4	. .	+ 4 31.4	130 0 16.0	+ 0.1
28	341 42	11.0	10.1	17.5	11.8	34	. .	362	. .	350	. .	35.3	341 45 51.4	. .	− 18.2	32 51 54.4	+13.2
29	63 4	6.3	5.4	14.8	8.4	38	750	730	. .	. .	. .	35.3	63 6 47.1	. .	+ 1 48.6	114 14 56.9	+ 4.6
30	71 32	9.2	6.3	15.8	10.0	35	660	690	. .	. .	. .	35.3	71 35 32.3	. .	+ 2 44.6	122 44 38.1	+ 3.7
31	69 24	10.0	7 3	14.9	10.0	32	445	470	. .	. .	. .	35.3	69 28 21.4	. .	+ 2 26.7	120 37 9.3	+ 4.6
32	78 40	11.8	9.0	16.0	12.4	29	470	430	. .	. .	. .	35.3	78 45 5.6	. .	+ 4 30.5	129 55 57.3	+ 3.6
33	61 6	7.8	5.3	16.6	11.0	25	730	740	. .	. .	. .	35.3	61 12 4.8	. .	+ 1 40.4	112 20 6.4	+ 7.1
34	61 6	7.8	5.3	16.6	11.0	27	. .	. .	. .	082	050	35.3	61 11 45.1	. .	+ 1 40.4	112 19 46.7	+ 7.1
35	70 34	8.9	6.6	16.0	9.5	34	600	618	. .	. .	. .	35.3	70 37 48.7	. .	+ 2 36.3	121 46 46.2	+ 6.9
36	73 16	11.4	7.7	18.4	12.2	33	215	240	. .	. .	. .	35.3	73 20 7.7	. .	+ 3 2.8	124 29 31.7	+ 6.8
37	72 24	10.3	6.8	15.7	11.0	37	775	795	. .	. .	. .	35.3	72 26 59.4	73.2	+ 2 53.4	123 36 14.0	+ 7.4
38	54 34	11.4	9.6	20.0	12.1	34	455	. .	. .	. .	492	35.3	54 37 48.2	. .	+ 1 18.0	105 45 27.4	. .
39	54 34	11.4	9.6	20.0	12.1	33	. .	350	. .	390	. .	35.3	54 38 5.2	. .	+ 1 18.0	105 45 44.4	. .
40	61 56	10.6	7.7	17.8	10.7	34	. .	. .	. .	180	200	35.3	61 59 54.5	. .	+ 1 44.0	113 7 59.7	+ 9.9
41	33 52	11.1	10.0	21.1	14.3	34	525	518	. .	530	548	35.3	33 55 46.8	. .	+ 37.5	85 2 45.5	+ 1.0
42	44 26	8.0	6.2	17.0	8.8	34	380	402	. .	. .	. .	35.3	44 29 52.6	. .	+ 54.8	95 37 8.6	+20.1
43	325 8	7.5	7.8	16.0	12.0	36	. .	700	. .	718	. .	35.3	325 11 17.8	. .	− 38.8	16 17 0.2	+ 1.7
44	42 34	8.3	5.4	15.4	8.9	32	328	312	. .	. .	. .	35.3	42 35 51.8	. .	+ 51.3	93 43 4.3	+20.6
45	10 26	8.5	9.2	20.4	11.8	36	820	830	. .	. .	. .	35.3	10 29 13.2	. .	+ 10.3	61 35 44.7	+ 2.9
46	40 12	9.7	7.5	17.9	11.0	39	. .	. .	. .	290	310	35.3	40 17 9.5	. .	+ 47.3	91 24 18.0	− 6.4
47	47 12	10.1	9.0	18.8	12.1	35	. .	290	. .	310	. .	35.3	47 18 9.4	. .	+ 1 0.5	98 25 31.1	− 4.9
48	77 26	10.0	7.2	15.6	10.0	32	815	830	. .	. .	. .	35.3	77 30 15.6	. .	+ 4 6.1	128 40 42.9	+25.1
49	8 38	9.2	8.9	18.8	11.0	31	242	235	. .	. .	. .	35.3	8 42 39.3	. .	+ 8.6	59 49 9.1	+16.3

No.	Barom.	At. Ther.
	in.	°
4	29.87	84.6
9	29.845	87.7
15	29.90	78.5
37	29.92	74.7

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' ''	' ''	' ''	' ''
1	− 2.4	+ 4.7	. .	+ 2.3
2	− 2.4	− 4.6	. .	− 7.0
3	− 4.6	+ 15 53.5	. .	+ 15 48.9
4	− 4.7	− 15 53.5	. .	− 15 58.2
5	− 3.8	. .	0.0	− 3.8
12	−45 16.9	+ 14 55.1	. .	− 30 21.8
38	− 0.8	+ 8.5	. .	+ 7.7
39	− 0.8	− 8.5	. .	− 9.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Sept. 4	1	β Ceti	P.	9.6	12.2	13.8	20.2	22.4	24.7	31.0	32.7	35.4	38 22.44	− 0.23	−60.06	−59.98	0 37 22.23	+ 0.13
	2	B. A. C. 259 . .	P.	36.8	40.0	42.0	49.8	52.4	55.0	2.7	4.7	7.8	50 52.36	− 0.08	. .	−60.01	0 49 52.27	− 2.97
	3	B. A. C. 272 . .	P.	24.5	27.4	29.1	36.3	38.6	40.9	48.2	49.8	52.8	53 38.62	− 0.24	. .	−60.01	0 52 38.37	− 3.42
	4	B. A. C. 289 . .	P.	17.5	20.4	22.4	29.5	32.1	34.3	41.5	43.3	46.5	57 31.94	− 0.25	. .	−60.01	0 56 31.68	− 3.45
	5	B. A. C. 332 . .	P.	9.0	11.7	13.2	19.4	21.6	23.7	29.8	31.4	34.0	3 21.53	− 0.22	. .	−60.01	1 2 21.30	− 3.08
	6	B. A. C. 355 . .	P.	5.6	8.4	10.3	17.7	20.0	22.6	29.9	31.8	34.8	6 20.12	− 0.25	. .	−60.01	1 5 19.86	− 3.41
	7	Polaris	P.	. .	. .	26.0	52.0	17.5	42.0	11.0	. .	. .	14 17.70	+ 9.52	. .	−59.99	1 13 27.23	− 3.09
	8	B. A. C. 445 . .	P.	44.6	47.3	49.0	56.2	58.6	1.0	8.1	9.8	13.0	23 58.62	− 0.24	. .	−60.02	1 22 58.36	− 3.24
	9	B. A. C. 458 . .	P.	31.0	34.0	35.8	43.0	45.3	47.8	54.8	56.6	59.7	26 45.33	− 0.24	. .	−60.02	1 25 45.07	− 3.22
	10	B. A. C. 489 . .	P.	. .	20.5	22.9	25.3	27.8	30.1	34.9	36.6	39.5	31 25.34	− 0.24	. .	−60.02	1 30 25.08	− 3.19
	11	B. A. C. 526 . .	P.	46.0	49.3	51.2	59.2	1.7	4.4	12.3	14.0	17.4	37 1.72	− 0.25	. .	−60.03	1 36 1.44	− 3.32
	12	B. A. C. 536 . .	P.	6.0	8.9	10.5	16.9	19.1	21.2	27.5	29.2	31.9	39 19.02	− 0.23	. .	−60.03	1 38 18.76	− 2.97
	13	β Arietis	P.	34.2	37.0	38.5	45.1	47.3	49.5	55.9	57.5	0.4	48 47.27	− 0.16	−60.03	−59.99	1 47 47.12	+ 0.06
	14	Durch. 2°, 315. .	P.	. .	. .	21.4	23.5	25.5	27.6	29.8	. .	. .	56 25.56	− 0.20	. .	−60.03	1 55 25.33	− 2.78
	15	α Arietis	P.	. .	. .	. .	10.8	13.0	15.1	19.5	21.2	24.2	1 10.73	− 0.15	−59.97	−59.99	2 0 10.59	− 0.01
	16	Neptune . . .	P.	48.7	51.3	52.8	59.0	1.1	3.3	9.4	11.0	13.6	6 1.13	− 0.18	. .	−60.04	2 5 0.91	. .
6	17	ρ Leonis	F.	. .	. .	13.5	15.7	17.9	19.9	22.0	. .	. .	27 17.80	− 0.27	−62.99	−63.02	10 26 14.51	− 0.10
7	18	Sun I, S. . . .	F.	10.4	13.2	14.6	18.6	22.7	27.0	31.0	32.5	35.3	3 22.81	− 0.29	. .	−63.04	11 2 19.48	. .
	19	Sun II, N. . . .	F.	. .	. .	27.2	29.3	31.3	33.4	35.4	. .	. .	5 31.32	− 0.29	. .	−63.04	11 4 27.99	. .
	20	Polaris, S. P. . .	F.	36.0	49.5	44.0	53.5	. .	. .	. .	. .	. .	14 59.10	−22.24	. .	−63.09	1 13 33.77	+ 1.83
	21	η Bootis	F.	35.6	38.1	39.9	46.4	48.4	50.6	57.0	58.7	1.4	49 48.46	− 0.20	−63.23	−63.13	13 48 45.13	+ 0.05
	22	α Bootis	F.	49.0	51.7	53.3	59.9	2.0	4.2	10.7	12.4	15.0	11 2.02	− 0.20	−63.14	−63.16	14 9 58.66	− 0.02
	23	κ Ophiuchi . . .	F.	38.2	40.6	42.3	48.4	50.5	52.6	58.8	0.3	3.0	52 50.52	− 0.23	−63.34	−63.38	16 51 46.91	0.00
	24	Moon I, N. . .	F.	10.7	13.6	15.5	22.7	25.0	27.5	34.6	36.4	39.3	54 25.03	− 0.51	. .	−63.31	16 53 21.21	+69.35
	25	ε Ursæ Minoris. .	F.	. .	. .	. .	. .	. .	. .	48.3	59.0	18.6	59 47.87	+ 3.56	. .	−63.38	16 58 48.05	− 0.16
	26	α^1 Herculis . . .	F.	49.7	52.3	53.8	0.2	2.3	4.4	10.8	12.3	14.9	10 2.30	− 0.19	−63.34	−63.39	17 8 58.72	− 0.03
	27	44 Ophiuchi . . .	F.	37.3	40.0	41.7	48.2	50.5	52.7	59.5	1.0	4.0	19 50.54	− 0.49	−63.35	−63.40	17 18 46.65	− 0.02
	28	B. A. C. 5918 . .	F.	52.9	57.8	0.8	12.5	16.5	20.4	32.2	35.3	40.0	25 16.49	+ 0.49	. .	−63.35	17 24 13.63	− 1.05
	29	α Ophiuchi . . .	F.	1.0	3.6	5.1	11.3	13.5	15.6	21.8	23.5	26.0	30 13.49	− 0.21	−63.34	−63.43	17 29 9.85	− 0.06
	30	B. A. C. 5967 . .	F.	14.0	16.8	18.5	25.1	27.3	29.6	36.3	38.0	40.8	33 27.38	− 0.10	. .	−63.38	17 32 23.90	− 1.84
	31	XVII, 16 . . .	F.	57.3	0.0	1.6	8.0	10.2	12.5	18.9	20.6	23.4	41 10.28	− 0.45	. .	−63.39	17 40 6.44	− 2.54
	32	B. A. C. 6036 . .	F.	33.3	37.1	39.4	48.5	51.6	54.7	3.6	5.9	9.7	44 51.53	+ 0.21	. .	−63.39	17 43 48.35	− 1.48
	33	Mural Zones 27, 50	F.	36.0	38.8	40.5	47.6	50.0	52.2	59.1	1.0	3.8	51 49.89	− 0.51	. .	−63.40	17 50 45.98	− 2.77
	34	B. A. C. 6103 . .	F.	17.2	20.4	22.3	29.8	32.3	34.9	42.5	44.3	47.5	57 32.36	− 0.58	. .	−63.41	17 56 28.37	− 2.99
	35	XVIII, 3 . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	36	XVIII, 4 . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	37	XVIII, 5 . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	38	Weisse (2) 395 .	F.	59.8	2.5	4.3	10.5	12.8	15.0	11.6	13.3	16.0	16 12.87	− 0.14	. .	−63.43	18 15 9.30	− 2.09
	39	Weisse (2) 415 .	F.	38.0	10.8	42.6	49.0	. .	53.5	0.1	1.6	4.7	16 51.31	− 0.14	. .	−63.43	18 15 47.74	− 2.09
	40	1 Aquilæ . . .	F.	18.6	21.1	22.5	28.8	30.8	32.9	39.0	40.5	43.0	29 30.80	− 0.36	−63.53	−63.51	18 28 26.93	+ 0.09
	41	XVIII, 15 . . .	F.	1.9	5.0	6.8	14.0	16.5	19.0	26.5	28.0	31.2	31 16.54	− 0.55	. .	−63.46	18 30 12.53	− 3.17
	42	B. A. C. 6365 . .	F.	47.7	51.0	52.9	0.6	3.1	5.8	13.6	15.5	18.9	37 3.23	+ 0.06	. .	−63.47	18 35 59.82	− 1.91
	43	XVIII, 21 . . .	F.	37.8	40.4	42.1	49.0	51.5	53.9	0.9	2.6	5.5	40 51.52	− 0.51	. .	−63.48	18 39 47.53	− 3.12
	44	B. A. C. 6680 . .	F.	24.4	27.4	29.2	36.2	38.7	41.0	48.2	50.0	53.0	25 38.68	− 0.53	. .	−63.54	19 24 34.61	− 3.48
	45	Mur. Zones 176, 77	F.	6.6	9.6	11.1	18.0	20.3	22.6	29.4	31.0	33.9	29 20.28	− 0.50	. .	−63.55	19 28 16.23	− 3.36
	46	Mur. Zones 176, 78	F.	. .	. .	54.0	56.4	58.9	1.2	3.4	. .	. .	29 58.78	− 0.50	. .	−63.55	19 28 54.73	− 3.36
	47	XIX, 12 . . .	F.	59.4	2.0	3.8	10.4	12.6	14.7	21.5	23.0	25.7	41 12.57	− 0.46	. .	−63.57	19 40 8.54	− 3.29
	48	B. A. C. 6817 . .	F.	9.4	12.8	14.8	22.8	25.6	28.3	36.2	38.0	41.6	47 25.50	+ 0.08	. .	−63.58	19 46 22.00	− 2.20
	49	λ Ursæ Minoris. .	F.	44.0	. .	. .	. .	. .	. .	3.0	. .	42.0	49 43.12	+28.33	. .	−63.61	19 49 7.84	− 2.26

14, 16, 38. Wire A used.
20. Transits at B and C_1. Bisections at B.
25. Transits and bisections at set D.
28, 36. Bisections at D.
47. Wire B used.
49. Transits at wires B_1, D_1, and D_3; bisections at D_1, D_2, and D_3.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	57 28	10 2.5	0.5	10.9	4.7	33	515	525	. .	525	540	35.3	57 32 11.4	. .	+ 1 27.6	108 40 0.2	+ 2.0
2	1 0	12.5	12.7	22.3	15.5	32	955	965	. .	. .	. .	35.3	1 4 9.2	. .	+ 1.0	52 10 31.4	+14.5
3	68 48	8.5	4.8	15.0	10.0	30	700	655	. .	. .	. .	35.3	68 52 49.6	. .	+ 2 23.6	120 1 34.4	+26.3
4	71 0	11.2	8.6	18.0	12.4	33	540	582	. .	. .	. .	35.3	71 4 2.5	69.3	+ 2 41.4	122 13 5.1	+26.7
5	49 38	10.7	8.9	19.6	13.1	30	195	215	. .	. .	. .	35.3	49 42 53.6	. .	+ 1 5.9	100 50 20.7	+24.4
6	71 42	10.4	8.4	17.4	11.9	36	805	792	. .	. .	. .	35.3	71 45 13.4	. .	+ 2 47.9	122 54 22.5	+27.3
7	310 12	12.6	11.5	20.3	16.0	33	022	005	990	012	000	35.3	310 16 9.3	. .	− 1 6.0	1 21 24.5	+ 2.0
8	69 20	12.1	9.0	18.6	13.7	36	920	932	. .	. .	. .	35.3	69 23 10.2	. .	+ 2 27.6	120 31 59.0	+28.1
9	69 24	9.5	6.7	16.7	10.7	31	900	935	. .	. .	. .	35.3	69 28 29.3	. .	+ 2 28.4	120 37 18.9	+28.2
10	69 20	14.4	11.8	22.4	17.6	35	. .	. .	. .	025	060	35.3	69 23 36.5	. .	+ 2 27.8	120 32 25.5	+28.4
11	77 32	12.4	10.3	17.8	13.7	37	080	120	. .	. .	. .	35.3	77 35 7.2	. .	+ 4 8.5	128 45 36.9	+29.6
12	55 24	10.2	8.5	19.8	12.5	35	. .	070	. .	092	. .	35.3	55 27 39.6	. .	+ 1 21.2	106 35 22.0	+26.7
13	18 38	8.5	8.0	19.4	10.2	36	640	655	. .	630	650	35.3	18 41 17.2	. .	+ 19.0	69 47 57.4	+ 2.5
14	36 28	6.6	4.3	16.0	8.3	27	. .	. .	. .	. .	715	35.3	36 36 9.7	. .	+ 41.6	87 43 12.5	+22.9
15	15 58	9.1	8.5	18.0	10.7	38	. .	. .	. .	210	190	35.3	16 0 53.6	. .	+ 16.1	67 7 30.9	+ 2.1
16	28 2	11.3	11.0	21.1	12.9	41	105	090	. .	120	132	35.3	28 6 39.0	68.3	+ 30.0	79 13 30.2	. .
17	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
18	33 2	7.0	4.7	15.4	8.3	34	956	980	. .	. .	. .	30.3	33 5 40.5	. .	+ 36.3	84 12 38.0	. .
19	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	74.5	. .	. . . .	. .
20	307 30	8.0	8.1	17.9	14.6	35	254	268	250	. .	. .	30.3	307 33 30.2	. .	− 1 12.0	358 38 39.4	+ 1.0
21	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
22	19 0	7.0	6.3	19.2	10.7	35	. .	900	. .	976	. .	30.3	19 3 23.6	78.5	+ 19.1	70 10 3.9	+ 2.9
23	29 14	1.6	29.2	10.5	4.5	30	426	436	. .	. .	. .	31.3	29 18 55.4	. .	+ 31.2	80 25 47.8	+ 2.7
24	66 50	7.7	5.1	17.7	10.5	33	. .	864	830	808	. .	31.3	66 53 57.1	. .	+ 2 9.4	118 2 27.7	. .
25	316 36	2.6	1.4	12.3	7.6	33	. .	. .	. .	766	788	31.3	316 40 2.9	75.7	− 52.4	7 45 31.7	+ 1.7
26	24 18	5.8	3.5	14.9	8.0	37	032	040	. .	122	132	31.3	24 21 9.8	. .	+ 25.2	75 27 56.2	+ 1.3
27	62 52	6.5	3.5	15.6	8.8	35	658	686	. .	. .	. .	31.3	62 55 30.2	. .	+ 1 48.3	114 3 39.7	+ 0.7
28	340 4	6.0	5.5	13.5	9.7	32	. .	. .	. .	048	052	31.3	340 8 26.3	. .	− 20.1	31 14 27.4	+ 8.7
29	26 10	5.2	3.7	13.8	8.0	33	. .	726	. .	740	. .	31.3	26 14 1.4	. .	+ 27.4	77 20 50.0	+ 1.0
30	14 26	4.7	3.0	15.5	6.0	33	. .	064	. .	094	. .	31.3	14 30 11.9	. .	+ 14.4	65 36 47.5	+ 3.9
31	59 36	4.8	3.0	15.2	8.0	35	850	844	. .	. .	. .	31.3	59 39 28.4	. .	+ 1 34.8	110 47 24.4	− 9.8
32	351 10	6.1	6.0	15.2	8.7	32	624	658	. .	. .	. .	31.3	351 14 17.0	. .	− 8.6	42 20 29.6	+ 8.5
33	67 30	7.6	4.2	15.5	9.2	25	196	208	. .	. .	. .	31.3	67 36 9.9	. .	+ 2 14.3	118 44 45.4	−11.9
34	74 49	8.3	4.9	15.7	9.8	31	152	146	. .	. .	. .	31.3	74 44 38.2	. .	+ 3 21.1	125 54 20.5	−14.0
35	58 16	4.6	0.0	12.4	5.7	34	722	738	. .	. .	. .	31.3	58 19 47.6	. .	+ 1 30.1	109 27 38.9	− 7.8
36	68 22	4.5	1.5	11.8	6.4	36	. .	. .	. .	. .	220	31.3	68 25 25.0	. .	+ 2 20.0	119 34 6.2	−11.2
37	59 54	7.2	5.4	15.9	10.4	35	. .	. .	. .	590	564	31.3	59 57 31.2	. .	+ 1 36.1	111 5 28.5	− 8.3
38	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
39	17 56	12.1	11.4	23.7	15.4	31	. .	. .	. .	260	280	31.3	18 0 31.6	. .	+ 18.1	69 7 10.9	+ 5.1
40	47 8	5.1	2.5	13.2	6.1	32	050	054	. .	. .	. .	31.3	47 12 27.7	. .	+ 1 0.3	98 19 49.2	+ 1.1
41	71 36	4.9	0.3	11.9	5.1	41	. .	. .	. .	362	360	31.3	71 38 6.7	. .	+ 2 46.4	122 47 14.3	−10.4
42	0 34	4.4	3.0	13.5	6.8	32	. .	422	. .	432	. .	31.3	0 38 22.4	. .	+ 0.6	51 44 44.2	+ 9.4
43	67 12	8.4	4.8	15.0	10.1	32	. .	. .	. .	854	860	31.3	67 16 12.9	73.2	+ 2 12.5	118 24 46.6	− 8.3
44	69 54	4.4	29.5	9.9	4.5	30	040	080	. .	. .	. .	31.3	69 59 0.0	. .	+ 2 33.8	121 7 55.0	− 5.2
45	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
46	65 24	6.1	1.6	12.3	7.5	36	. .	. .	. .	515	520	31.3	65 27 19.6	. .	+ 2 2.9	116 35 43.7	− 3.5
47	60 58	12.4	9.7	20.3	14.6	31	. .	590	. .	608	. .	31.3	60 59 54.5	. .	+ 1 41.6	112 7 57.3	− 1.2
48	358 32	7.7	8.0	18.5	11.1	31	. .	590	. .	580	. .	31.3	358 36 30.9	. .	− 1.4	49 42 50.7	+12.2
49	309 54	12.2	12.0	21.3	17.8	30	. .	. .	502	522	582	31.3	309 58 45.3	. .	− 1 7.5	1 3 59.0	+ 1.3

No.	Barom.	At. Ther.
	in.	°
4	29.94	71.2
16	29.96	70.0
19	30.14	74.0
22	30.11	77.8
25	30.10	74.8
43	30.13	70.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
16	− 0.1	. .	. .	− 0.1
18	− 4.8	− 15 54.3	. .	− 15 59.1
24	−49 49.1	+ 14 49.5	. .	− 34 59.6

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Sept. 7	1	B. A. C. 6839 . .	F.	14.0	16.7	18.3	24.8	27.0	29.0	35.5	37.0	[illegible]	51 26.90	− 0.18	. .	−63.58	19 50 23.14	− 2.57
	2	B. A. C. 6977 . .	F.	33.5	36.3	38.0	45.2	47.6	49.9	57.0	58.8	[illegible]	12 47.56	− 0.53	. .	−63.61	20 11 43.42	− 3.68
	3	B. A. C. 7022 . .	F.	34.2	37.8	39.7	47.6	50.3	53.0	0.9	3.0	[illegible]	18 50.31	+ 0.08	. .	−63.62	20 17 46.77	− 2.35
	4	O. Arg. S. 20578 .	F.	46.4	49.3	51.0	57.8	0.2	2.4	9.3	10.8	[illegible]	26 0.10	− 0.49	. .	−63.63	20 24 55.98	− 3.57
	5	B. A. C. 7149 . .	F.	43.8	46.5	48.0	54.3	56.6	58.7	5.0	6.6	[illegible]	34 56.53	− 0 19	. .	−63.64	20 33 52.70	− 2.74
	6	B. A. C. 7204 . .	F.	. .	. .	. .	. .	17.9	20.4	25.1	27.0	[illegible]	42 15.37	− 0.01	. .	−63.66	20 41 11.70	− 2.52
	7	B. A. C. 7286 . .	F.	18.4	21.9	23.9	31.6	34.3	36.9	44.8	46.6	[illegible]	55 34.27	− 0.61	. .	−63.68	20 54 29.98	− 4.22
	8	B. A. C. 7292 . .	F.	51.1	54.5	56.3	4.3	6.9	9.5	17.6	19.4	[illegible]	56 6.93	− 0.61	. .	−63.68	20 55 2.64	− 4.23
	9	B. A. C. 7353 . .	F.	55.5	58.8	0.8	8.5	11.4	14.2	22.2	24.0	[illegible]	6 11.44	− 0.62	. .	−63.69	21 5 7.13	− 4.30
	10	B. A. C. 7398 . .	F.	21.0	24.2	26.0	34.0	36.6	39.2	47.0	49.0	52.4	13 36.60	+ 0.06	. .	−63.70	21 12 32.96	− 2.58
	11	B. A. C. 7447 . .	F.	4 0	6.8	8.4	15.0	17.3	19.5	26.0	27.8	30.4	21 17.24	− 0.46	. .	−63.71	21 20 13.07	− 3.62
	12	B. A. C. 7458 . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	13	B. A. C. 7502 . .	F.	11.8	15.0	16.8	24.0	26.6	29.0	36.3	38.0	41.2	30 26.52	− 0.56	. .	−63.73	21 29 22.23	− 4.05
	14	Saturn I, N. . .	F.	32.8	35.4	36.9	. .	. .	. .	53.8	55.3	[illegible]	36 45.37	− 0.42	. .	−63.74	21 35 41.21	. .
	15	Saturn II, S. . .	F.	. .	. .	42.8	44.8	46.9	48.9	51.0	. .	. .	36 46.88	− 0.42	. .	−63.74	21 35 42.72	. .
	16	B. A. C. 7613 . .	F.	14.3	17.4	19.4	27.4	29.9	32.6	40.2	42.0	45.5	47 29.86	− 0.60	. .	−63.76	21 46 25.50	− 4.27
	17	B. A. C. 7647 . .	F.	37.0	40.3	42.3	50.2	52.9	55.4	3.0	5.0	[illegible]	52 52.73	− 0.61	. .	−63.76	21 51 48.36	− 4.33
	18	B. A. C. 7673 . .	F.	5.2	8.2	10.0	17.0	19 4	21.8	29.0	30.8	33.0	58 19.47	− 0.53	. .	−63.77	21 57 15.17	− 3.96
	19	32 Ursæ Majoris, S. P.	F.	32.0	25.9	22.2	7.4	2.5	57.5	42.6	39.0	32.5	10 2.40	− 1.64	. .	−63.79	10 8 56.97	− 0.13
	20	Anonymous . .	F.	50.0	52.8	54.5	0.8	2.9	5.0	11.3	12.9	15.7	14 2.88	− 0.42	. .	−63.80	22 12 58.66	− 3.53
	21	Mural Zones 205, 40	F.	32.4	35.0	36.5	42.9	45.1	47.1	53.4	55.0	57.9	17 45.03	− 0.42	. .	−63.80	22 16 40.81	− 3.52
	22	Mural Zones 204, 17	F.	11.8	14.5	16.0	22.5	24.6	26.6	33.0	34.6	37.3	20 24.54	− 0.41	. .	−63.81	22 19 20.32	− 3.52
	23	B. A. C. 7842 . .	F.	17.4	20.6	22.2	29.7	32.0	34.5	41.8	43.6	40.8	25 32.07	− 0.55	. .	−63.82	22 24 27.70	− 4.05
	24	Weisse 604 . .	F.	3.7	6.4	7.9	14.3	16.4	18.6	24.7	26.5	29.0	31 16.39	− 0.40	. .	−63.83	22 30 12.16	− 3.46
	25	B. A. C. 7944 . .	F.	33.3	36.6	38.7	46.4	49.0	51.6	59.6	1.4	4.7	41 49.03	− 0.60	. .	−63.85	22 40 44.58	− 4.30
	26	B. A. C. 7957 . .	F.	48.0	51.1	53.2	1.0	3.9	6.5	14.6	16.5	19.9	45 3.86	− 0.61	. .	−63.85	22 43 59.40	− 4.34
	27	B. A. C. 7980 . .	F.	56.0	58.7	0.2	6.6	8.6	10.8	17.3	18.9	21.7	49 8.76	− 0.42	. .	−63.86	22 48 4.48	− 3.54
	28	B. A. C. 7987 . .	F.	. .	. .	. .	. .	. .	. .	19.4	21.1	24.3	50 9.61	− 0.55	. .	−63.86	22 49 5.20	− 4.04
	29	B. A. C. 8025 . .	F.	28.0	31.0	32.9	40.6	43.0	45.5	3.0	4.8	8.0	57 42.98	− 0.57	. .	−63.87	22 56 38.54	− 4.11
	30	B. A. C. 8045 . .	F.	48.6	52.0	54.0	59.2	4.5	9.7	15.0	17.0	20.4	1 4.49	− 0.61	. .	−63.87	23 0 0.01	− 4.29
	31	ψ^1 Aquarii . . .	F.	15.7	18.3	19.9	26.0	28.0	30.2	36.5	38.0	40.7	10 28.14	− 0.37	. .	−63.88	23 9 23.89	− 3.38
	32	θ Piscium . . .	F.	32.7	35.2	36.7	43.0	45.0	47.0	53.1	54.7	57.2	22 44.96	− 0.26	− 63.88	−63.87	23 21 40.83	+ 0.07
	33	ω Piscium . . .	F.	51.2	52.7	56.8	58.7	0.9	2.9	4.9	9.0	10.0	54 0.86	− 0.26	−63.87	−63.92	23 52 56.68	− 0.04
	34	Weisse 1114 . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	35	Eurydice . . .	F.	44.2	46.6	48.1	54.4	56.4	58.6	4.5	6.2	8.7	2 56.41	− 0.32	. .	−63.97	0 1 52.12	. .
	36	γ Pegasi	F.	. .	51.2	53.2	55.5	57.4	59.6	3.9	5.2	7.7	7 55.32	− 0.19	−64.05	−63.94	0 6 51.19	+ 0.11
	37	Metis	F.	58.9	1.6	7.5	9.2	11.4	13.3	15.5	21.0	23.7	16 11.34	− 0.37	. .	−63.99	0 15 6.98	. .
	38	B. A. C. 104 . .	F.	8.8	12.0	14.2	22.3	25.0	27.7	35.8	38.0	41.2	23 25.00	− 0.62	. .	−64.00	0 22 20.38	− 3.98
	39	B. A. C. 118 . .	F.	. .	. .	. .	. .	32.3	34.9	40.4	42.3	45.7	25 29.65	− 0.62	. .	−64.00	0 24 25.03	− 3.95
	40	B. A. C. 144 . .	F.	. .	. .	36.7	39.4	41.8	44.7	47.3	. .	. .	29 41.98	− 0.60	. .	−64.01	0 28 37.37	− 3.87
	41	B. A. C. 166 . .	F.	31.7	34.5	36.3	43.4	45.7	48.2	5.2	7.0	0.1	33 45.79	− 0.04	. .	−64.01	0 32 41.74	− 3.00
	42	β Ceti	F.	13.7	16.4	18.0	24.4	26.7	28.7	35.3	36.7	39.5	38 26.60	− 0.44	−63.96	−63.97	0 37 22.19	+ 0.04
	43	B. A. C. 259 . .	F.	40.6	43.9	45.7	53.6	56.0	58.8	6.5	8.3	11.7	50 56.12	+ 0.05	. .	−64.05	0 49 52.12	− 3.03
	44	B. A C. 272 . .	F.	. .	. .	. .	. .	. .	47.4	52.2	54.0	56.0	53 43.13	− 0.52	. .	−64.05	0 52 38.56	− 3.48
	45	ε Piscium . . .	F.	22.5	25.0	26.6	32.6	34.7	36.8	42.9	44.6	47.0	57 34.74	− 0.25	−64.03	−64.02	0 56 30.47	+ 0.03
	46	Polaris	F.	37.0	25.5	30.0	. .	. .	. .	. .	. .	. .	14 15.41	+22.17	. .	−64.04	1 13 33.54	+ 1.29
	47	ε Hydræ	P.	2.9	5.3	6.8	13.0	15.0	17.1	23.3	24.9	27.5	41 15.09	− 0.37	−64.33	−64.30	8 40 10.42	− 0.01
	48	ι Ursæ Majoris . .	P.	25.7	29.6	32.1	41.2	44.4	47.2	56.7	58.9	2.9	51 44.30	+ 0.18	. .	−64.31	8 50 40.17	+ 0.22
	49	α Hydræ	P.	19 9	22.3	23.9	30.0	32.2	34.3	40.3	42.0	44.6	22 32.17	− 0.49	−64.35	−64.34	9 21 27.34	− 0.02

7, 34. Wire B used.
8, 35. Wire A used.
19, 26, 40. Bisections at sets B and D.
46. Transits and bisections at wires B_1, B_2, and B_3.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	22 32	10 9.2	7.5	18.8	11.4	38	. .	276	. .	276	. .	31.3	22 34 47.8	65.6	+ 23.6	73 41 32.6	+ 8.9
2	68 48	9.2	6.1	17.4	12.2	33	. .	. .	. .	896	884	31.3	68 51 55.4	. .	+ 2 25.6	120 0 42.2	− 0.3
3	358 58	7.0	5.9	16.0	8.5	33	. .	. .	. .	696	692	31.3	359 2 1.3	. .	− 1.0	50 8 21.5	+13.1
4	64 4	4.2	1.2	12.7	6.1	29	. .	548	. .	558	. .	31.3	64 9 6.8	. .	+ 1 56.7	115 17 24.7	+ 2.1
5	23 20	8.9	7.4	18.4	10.4	30	. .	720	. .	720	. .	31.3	23 24 44.0	. .	+ 24.6	74 31 29.8	+11.0
6	5 20	5.0	4.7	14.8	8.5	37	. .	. .	. .	630	642	31.3	5 23 1.7	. .	+ 5.4	56 29 28.3	+13.4
7	77 50	11.4	7.3	16.0	12.8	38	538	546	.	. .	. .	31.3	77 50 9.8	. .	+ 4 17.7	129 0 48.7	+ 2.2
8	77 50	11.4	7.3	16.0	12.8	34	. .	. .	.	396	404	31.3	77 56 19.7	63.8	+ 4 19.8	129 7 0.7	+ 2.2
9	78 40	7.5	2.0	11.2	8.0	30	. .	. .	.	374	384	31.3	78 44 53.1	. .	+ 4 38.2	129 55 52.5	+ 3.2
10	359 58	8.8	7.7	18.0	10.7	37	. .	. .	. .	062	066	31.3	0 1 7.5	. .	0.0	51 7 28.7	+14.5
11	60 32	10.3	6.7	19.4	12.9	33	624	646	. .	. .	. .	31.3	60 35 57.7	. .	+ 1 40.1	111 43 59.0	+ 8.2
12	70 34	7.6	2.7	14.7	9.7	34	. .	. .	. .	804	810	31.3	70 37 43.9	. .	+ 2 40.5	121 46 45.6	+ 6.6
13	72 24	4.9	0.2	11.5	7.2	38	. .	250	. .	256	. .	31.3	72 26 53.7	. .	+ 2 58.1	123 36 13.0	+ 7.1
14	54 38	3.6	0.5	12.4	4.5	35	400	. .	. .	. .	474	31.3	54 41 37.5	. .	+ 1 20.4	105 49 19.1	. .
15	54 38	3.6	0.5	12.4	4.5	34	. .	274	. .	250	. .	31.3	54 41 55.6	. .	+ 1 20.4	105 49 37.2	. .
16	76 42	10.6	7.0	17.1	13.4	30	. .	990	. .	010	. .	31.3	76 46 38.6	. .	+ 3 57.7	127 56 57.5	+ 8.3
17	77 44	6.5	3.5	11.5	7.8	30	. .	990	. .	008	. .	31.3	77 48 43.3	. .	+ 4 17.8	128 59 22.3	+ 8.7
18	69 18	4.6	1.1	12.7	5.0	33	. .	152	. .	160	. .	31.3	69 22 11.8	. .	+ 2 30.4	120 31 3.4	+10.6
19	284 38	6.6	3.7	14.2	9.6	37	. .	. .	. .	758	752	31.3	284 40 58.9	. .	− 3 34.2	335 43 45.9	+ 3.1
20	54 58	6.7	2.9	16.5	9.3	36	. .	466	. .	476	. .	31.3	55 1 18.2	. .	+ 1 21.3	106 9 0.7	+13.8
21	54 22	8.0	4.2	15.6	9.3	31	. .	140	. .	180	. .	31.3	54 26 39.1	. .	+ 1 19.8	105 34 20.1	+14.2
22	54 22	8.0	4.2	15.6	9.3	28	. .	. .	. .	900	940	31.3	54 27 13.6	. .	+ 1 19.8	105 34 54.6	+14.4
23	71 46	4.9	0.5	10.5	6.3	35	. .	. .	. .	146	164	31.3	71 49 41.7	61.8	+ 2 52.2	122 58 55.1	+13.1
24	51 50	8.1	5.8	16.5	9.9	34	064	080	. .	. .	. .	31.3	51 53 53.3	. .	+ 1 12.8	103 1 27.3	+15.4
25	77 38	8.1	4.7	13.3	10.0	34	. .	448	. .	454	. .	31.3	77 41 48.8	. .	+ 4 15.9	128 52 25.9	+14.2
26	78 34	8.2	6.0	13.9	9.5	34	142	. .	. .	. .	118	31.3	78 37 53.5	. .	+ 4 36.5	129 48 51.2	+14.5
27	55 18	5.2	2.2	13.8	6.9	37	. .	. .	. .	306	318	31.3	55 21 7.4	. .	+ 1 22.5	106 28 51.1	+16.7
28	72 0	10.9	6.2	18.0	14.5	37	. .	. .	. .	930	934	31.3	72 2 52.3	. .	+ 2 54.5	123 12 8.0	+15.6
29	74 12	15.6	11.1	22.2	18.8	35	. .	080	. .	146	. .	31.3	74 15 30.8	. .	+ 3 19.9	125 25 11.9	+16.2
30	78 18	7.5	4.1	12.7	7.3	30	. .	122	. .	106	. .	31.3	78 22 56.3	61.3	+ 4 30.8	129 33 48.3	+16.2
31	48 34	7.5	5.1	15.0	7.7	32	218	242	. .	. .	. .	31.3	48 38 22.8	. .	+ 1 4.9	99 45 48.9	+18.4
32	33 8	9.3	6.5	17.5	11.2	36	. .	838	. .	842	. .	31.3	33 11 10.4	. .	+ 37.4	84 18 9.0	+ 2.3
33	32 38	8.5	5.5	15.9	8.4	31	970	990	. .	. .	. .	31.3	32 42 26.0	. .	+ 36.8	83 49 24.0	+ 1.1
34	42 34	2.4	29.7	10.8	4.1	32	. .	. .	. .	602	610	31.3	42 35 49.6	. .	+ 52.6	93 43 3.4	+20.8
35	40 10	6.2	2.7	14.8	8.6	35	446	458	. .	. .	. .	31.3	40 16 7.2	. .	+ 48.5	91 23 16.9	− 6.5
36	24 20	11.1	9.6	21.6	14.5	35	. .	. .	. .	046	056	31.3	24 33 35.1	. .	+ 26.0	75 30 22.3	+ 1.1
37	47 32	5.6	2.2	13.0	6.8	34	. .	598	. .	606	. .	31.3	47 35 48.8	. .	+ 1 2.7	98 43 12.7	− 5.0
38	79 20	7.7	4.8	13.0	9.4	31	. .	250	. .	384	. .	31.3	79 24 37.0	. .	+ 4 57.0	130 35 55.2	+24.2
39	78 56	18.0	14.3	24.8	22.5	29	. .	. .	. .	656	684	31.3	79 0 51.3	. .	+ 4 46.7	130 11 59.2	+24.4
40	77 26	9 29.8	26.1	5.6	2.3	33	. .	. .	. .	. .	740	31.3	77 30 8.1	. .	+ 4 12.7	128 40 42.0	+24.7
41	8 38	10 8.8	8.4	20.2	12.2	31	. .	066	. .	074	. .	31.3	8 42 37.6	. .	+ 9.0	59 49 7.8	+17.0
42	57 28	3.5	0.0	12.1	6.4	33	316	378	. .	. .	. .	31.3	57 32 9.0	60.0	+ 1 29.9	108 40 0.1	+ 1.9
43	1 0	9.0	6.5	17.9	12.4	33	128	104	. .	. .	. .	31 3	1 4 7.1	. .	+ 1.1	52 10 29.4	+15.3
44	68 48	11.0	6.3	18.0	13.8	30	. .	. .	. .	622	638	31.3	68 52 44.3	. .	+ 2 27.3	120 1 32.8	+26.1
45	31 36	2.5	1.2	11.7	4.9	35	. .	148	. .	154	. .	31.3	31 39 42.3	. .	+ 35.4	82 46 38.9	+ 0.7
46	310 12	9.5	6.7	16.4	12.3	33	304	190	170	. .	. .	31.3	310 16 7.8	60.2	− 1 7.6	1 21 21.4	− 0.1
47	31 56	0.2	28.4	10.0	3.9	32	542	. .	. .	. .	610	32.4	32 0 24.8	. .	+ 34.9	83 7 20.9	+ 1.2
48	350 18	3.0	2.6	13.0	7.3	33	860	. .	. .	. .	862	32.4	350 22 2.6	. .	− 9.5	41 28 14.3	+ 0.5
49	46 56	4.8	1.0	13.6	7.2	35	230	235	. .	300	312	32.4	46 59 39.9	76.7	+ 59.6	98 7 0.7	+ 2.3

No.	Barom.	At. Ther.
	in.	°
1	30.12	69.0
8	30.14	67.0
23	30.12	65.0
30	30.12	64.0
42	30.14	63.0
46	30.14	62.5
49	30.22	74.4

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
14	− 0.8	+ 9.1	. .	+ 8.3
15	− 0.8	− 9.0	. .	− 9.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Sept. 8	1	Sun I, N. . . .	P.	48.5	51.0	52.4	58.6	0.7	2.8	9.0	10.4	13.0	7 0.71	− 0.38	. .	−64.48	11 5 55.85	. .
	2	Sun II, S. . . .	P.	58.9	0.5	4.6	6.6	8.7	10.9	13.0	17.0	18.6	9 8.76	− 0.38	. .	−64.48	11 8 3.90	. .
	3	Mercury, C. . .	P.	56.7	59.2	0.8	6.9	9.0	11.0	17.3	18.8	21.3	3 9.00	− 0.42	. .	−64.55	12 2 4.03	+ 0.01
	4	12 Canum Venat. .	P.	0.5	4.0	5.5	13.6	16.1	18.7	26.6	28.5	31.9	51 16.16	0.00	−64.59	−64.54	12 50 11.62	+ 0.05
	5	Polaris, S. P. . .	P.	. .	. .	53.0	27.0	0.0	32.0	7.0	. .	. .	14 59.80	−26.87	. .	−64.58	1 13 28.35	− 4.18
	6	*a* Virginis . . .	P.	30.1	32.7	34.4	40.6	42.7	44.8	51.0	52.6	55.0	19 42.66	− 0.51	−64.70	−64.59	13 18 37.56	+ 0.09
	7	ζ Virginis . . .	P.	13.4	15.9	17.4	23.5	25.7	27.6	33.7	35.2	37.7	29 25.57	− 0.42	−64.69	−64.60	13 28 20.55	+ 0.09
	8	η Ursæ Majoris. .	P.	23.0	27.0	29.4	38.9	42.0	45.2	54.7	57.2	1.0	43 42.04	+ 0.22	. .	−64.62	13 42 37.64	+ 0.05
	9	η Bootis	P.	36.9	39.6	40.9	47.8	49.9	52.0	58.6	0.0	2.8	49 49.83	− 0.26	−64.55	−64.63	13 48 44.94	− 0.13
	10	a^1 Herculis . . .	P.	51.4	54.0	55.6	1.9	4.0	6.1	12.4	14.0	16.7	10 4.01	− 0.34	−64.91	−64.83	17 8 58.84	+ 0.10
	11	44 Ophiuchi . . .	P.	38.9	41.7	43.3	50.0	52.0	54.5	1.0	2.8	5.6	19 52.20	− 0.66	−64.85	−64.84	17 18 46.70	+ 0.04
	12	B. A. C. 5974 . .	P.	15.0	18.2	20.2	27.8	30.4	32.9	40.6	42.4	45.7	35 30.36	− 0.78	. .	−64.84	17 34 24.74	− 2.80
	13	B. A. C. 5996 . .	P.	13.0	15.6	17.2	23.3	25.4	27.5	33.5	35.1	37.8	38 25.38	− 0.42	. .	−64.84	17 37 20.12	− 2.12
	14	XVII, 18 . . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	15	Moon I, N. . .	P.	52.8	55.6	57.6	4.7	7.2	9.6	16.7	18.5	21.7	50 7.16	− 0.71	. .	−64.86	17 49 1.59	+70.49
	16	γ^2 Sagittarii . . .	P.	40.9	43.9	45.5	52.6	55.1	57.5	4.6	6.4	9.4	58 55.10	− 0.72	−64.80	−64.88	17 57 49.50	− 0.07
	17	XVIII, 3 . . .	P.	46.8	49.4	51.0	57.6	59.7	1.9	8.6	10.0	12.7	5 59.74	− 0.62	. .	−64.87	18 4 54.25	− 2.66
	18	XVIII, 5 . . .	P.	. .	. .	21.1	23.3	25.5	27.6	29.9	. .	. .	7 25.48	− 0.63	. .	−64.87	18 6 19.98	− 2.70
	19	XVIII, 7 . . .	P.	1.8	5.0	6.8	14.4	17.1	19.8	27.3	29.3	32.5	11 17.11	− 0.79	. .	−64.87	18 10 11.45	− 3.13
	20	XVIII, 9 . . .	P.	. .	. .	25.0	27.2	29.3	31.6	36.0	37.7	40.5	13 27.15	− 0.65	. .	−64.87	18 12 21.63	− 2.79
	21	Mars I, N. . . .	P.	. .	. .	. .	. .	. .	. .	36.5	38.3	41.0	17 27.32	− 0.69	. .	−64.88	18 16 21.75	+ 0.55
	22	Mars, S. . . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	23	B. A. C. 6350 . .	P.	52.8	57.0	59.4	9.3	12.9	16.3	26.2	28.7	33.0	32 12.84	+ 0.22	. .	−64.89	18 31 8.17	− 1.57
	24	*a* Lyræ	P.	33.3	36.8	38.8	46.6	49.3	51.9	59.7	1.6	4.7	33 49.19	− 0.05	−64.87	−64.91	18 32 44.23	− 0.02
	25	XVIII, 20 . . .	P.	43.5	46.2	47.9	54.5	56.8	59.0	5.7	7.2	10.1	39 56.77	− 0.65	. .	−64.90	18 38 51.22	− 2.96
	26	51 Cephei, S. P. . .	P.	. .	. .	. .	25.0	43.5	0.0	. .	. .	. .	42 42.81	−12.73	. .	−64.92	6 41 25.16	+ 0.28
	27	B. A. C. 6438 . .	P.	50.5	53.0	54.8	1.3	3.5	5.7	12.2	13.8	16.6	48 3.49	− 0.27	. .	−64.91	18 46 58.31	− 2.21
	28	ζ Aquilæ. . . .	P.	35.0	37.7	39.3	45.5	47.5	49.7	56.0	57.6	0.2	0 47.61	− 0.35	−65.00	−64.94	18 59 42.32	+ 0.14
	29	*d* Sagittarii . . .	P.	14.9	17.6	19.2	25.7	27.8	30.0	36.5	38.2	40.8	11 27.86	− 0.62	−64.98	−64.96	19 10 22.30	+ 0.04
	30	B. A. C. 6594 . .	P.	18.3	21.3	23.2	30.4	32.8	35.1	42.5	44.2	47.3	13 32.79	− 0.73	. .	−64.93	19 12 27.13	− 3.42
	31	B. A. C. 6622 . .	P.	6.6	10.0	11.0	20.2	22.7	25.5	33.8	35.6	39.1	16 22.72	− 0.83	. .	−64.93	19 15 16.96	− 3.79
	32	B. A. C. 6680 . .	P.	25.8	28.8	30.6	37.9	40.2	42.6	49.8	51.5	54.7	25 40.21	− 0.72	. .	−64.94	19 24 34.55	− 3.47
	33	Anonymous . .	P.	44.2	46.7	48.3	53.1	55.2	57.7	0.2	2.4	. .	28 57.69	− 0.68	. .	−64.95	19 27 52.06	− 3.34
	34	Mural Zones 176, 77	P.	8.3	11.1	12.8	19.7	21.6	24.3	31.1	32.8	35.5	29 21.91	− 0.68	. .	−64.95	19 28 16.28	− 3.35
	35	Mural Zones 176, 78	P.	. .	56.0	58.0	0.4	2.6	4.9	9.6	11.2	14.2	30 0.40	− 0.68	. .	−64.95	19 28 54.77	− 3.35
	36	B. A. C. 6790 . .	P.	14.6	17.9	20.0	28.0	30.7	33.5	41.6	43.5	46.8	44 30.73	− 0.82	. .	−64.96	19 43 24.95	− 3.94
	37	B. A. C. 6817 . .	P.	11.0	14.3	16.2	24.3	26.9	29.8	37.8	39.7	43.2	47 27.02	− 0.03	. .	−64.97	19 46 22.02	− 2.18
	38	XIX, 15 . . .	P.	12.0	14.8	16.4	23.3	25.6	27.9	34.9	36.7	39.5	50 25.68	− 0.69	. .	−64.97	19 49 20.02	− 3.48
	39	B. A. C. 6860 . .	P.	52.2	55.4	57.3	5.2	7.8	10.4	18.1	19.9	23.3	54 7.73	− 0.06	. .	−64.97	19 53 2.70	− 2.25
	40	Bonn VI, +38°,3836	P.	. .	. .	. .	. .	. .	. .	28.0	30.0	33.4	54 17.69	− 0.06	. .	−64.97	19 53 12.66	− 2.25
	41	B. A. C. 6922 . .	P.	53.3	56.6	58.4	6.1	8.6	11.2	18.8	20.7	23.8	4 8.61	− 0.78	. .	−64.98	20 3 2.85	− 3.88
	42	B. A. C. 6934 . .	P.	47.6	50.0	51.5	55.6	57.7	59.8	1.7	. .	. .	5 59.75	− 0.47	. .	−64.98	20 4 54.30	− 2.91
	43	B. A. C. 6977 . .	P.	35.0	38.0	39.7	46.8	49.3	51.5	58.7	0.4	3.4	12 49.20	− 0.71	. .	−64.99	20 11 43.50	− 3.67
	44	B. A. C. 7022 . .	P.	36.0	39.3	41.3	49.2	51.9	54.6	2.6	4.6	7.9	18 51.93	− 0.04	. .	−64.99	20 17 46.90	− 2.33
	45	O. Arg. S. 20601 .	P.	20.3	23.0	24.7	31.5	33.9	36.2	42.8	44.5	47.4	27 33.81	− 0.67	. .	−65.00	20 26 28.14	− 3.56
	46	Mural Zones 64, 16	P.	23.1	24.8	29.3	31.5	33.9	36.1	38.4	42.9	44.5	29 33.83	− 0.67	. .	−65.00	20 28 28.16	− 3.56
	47	B. A. C. 7175 . .	P.	5.0	8.4	10.4	18.2	20.9	23.6	31.5	33.6	37.0	39 20.96	− 0.81	. .	−65.02	20 38 15.13	− 4.19
	48	B. A. C. 7218 . .	P.	30.5	34.7	37.4	47.4	50.8	54.3	4.3	6.7	11.1	43 50.80	+ 0.22	. .	−65.02	20 42 46.00	− 2.30
	49	B. A. C. 7237 . .	P.	37.0	39.9	41.4	48.2	50.4	52.8	59.5	1.2	3.9	46 50.48	− 0.66	. .	−65.03	20 45 44.79	− 3.60

15. Bisections at wires III–VI.
33, 40. Wire A used.
34, 46. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	32 52	10 6.2	3.8	16.6	8.8	32	105	100	. .	. .	. .	32.4	32 56 26.5	. .	+ 35.8	84 3 23.5	. .
2	33 24	6.6	3.2	15.9	9.3	32	. .	. .	. .	810	840	32.4	33 28 15.2	78.8	+ 36.6	84 35 13.0	. .
3	38 34	3.0	1.1	12.7	5.6	35	500	435	. .	320	365	32.4	38 37 39.0	. .	+ 44.1	89 44 44.3	. .
4	359 50	5.1	4.7	16.4	8.4	33	. .	508	. .	568	. .	32.4	359 54 4.8	. .	— 0.1	41 0 25.9	+ 1.4
5	307 30	6.0	4.9	14.8	12.0	35	785	760	780	790	750	32.4	307 33 29.3	. .	— 1 11.5	358 38 39.0	+ 0.3
6	49 18	5.6	3.8	15.3	8.4	28	985	025	. .	085	115	32.4	49 23 13.5	. .	+ 1 4.2	100 30 38.9	+ 0.7
7	38 46	5.5	3.2	15.3	8.2	32	. .	175	. .	200	. .	32.4	38 50 25.8	. .	+ 44.4	89 57 31.4	+ 3.1
8	348 54	4.7	2.8	12.8	7.9	35	505	510	. .	512	548	32.4	348 57 36.4	. .	— 10.8	40 3 46.8	+ 1.6
9	19 48	4.6	3.8	16.4	8.3	34	175	155	. .	185	198	32.4	19 51 55.2	. .	+ 19.9	70 58 36.3	+ 3.5
10	24 18	9.2	5.3	16.2	9.0	36	970	970	. .	990	002	32.7	24 21 10.9	76.0	+ 25.2	75 27 57.3	+ 2.4
11	62 52	5.0	2.0	13.8	7.2	35	735	750	. .	825	803	32.7	62 55 31.9	. .	+ 1 48.5	114 3 41.6	+ 2.6
12	75 38	7.8	4.6	14.0	8.5	29	262	305	. .	. .	. .	32.7	75 43 9.1	. .	+ 3 35.1	126 53 5.4	—15.8
13	34 12	9.2	5.6	15.9	9.8	34	640	660	. .	685	705	32.7	34 15 46.0	. .	+ 38.0	85 22 45.2	— 1.4
14	77 42	8.0	3.6	12.5	7.6	33	. .	. .	. .	668	. .	32.7	77 46 3.5	. .	+ 4 11.0	128 56 35.7	—16.1
15	67 58	6.3	3.5	14.2	8.3	32	. .	180	215	208	270	32.7	68 2 25.6	. .	+ 2 17.4	119 11 4.2	. .
16	69 12	9.6	5.4	15.9	10.5	30	550	565	. .	640	655	32.7	69 16 47.7	. .	+ 2 26.4	120 25 35.3	— 0.6
17	58 16	6.1	2.0	14.0	7.2	34	. .	680	. .	. .	. .	32.7	58 19 48.2	. .	+ 1 30.4	109 27 39.8	— 7.8
18	59 54	6.5	4.5	14.8	8.5	35	. .	. .	. .	850	725	32.7	59 57 30.5	. .	+ 1 36.3	111 5 28.0	— 8.3
19	76 2	8.4	4.7	13.8	8.6	32	. .	730	. .	880	. .	32.7	76 6 15.5	. .	+ 3 41.6	127 16 18.3	—13.5
20	62 10	9.2	5.0	15.8	9.8	34	. .	. .	. .	320	310	32.7	62 13 51.7	. .	+ 1 45.7	113 21 58.6	— 8.6
21	65 54	5.2	2.7	12.5	6.9	35	. .	. .	. .	260	. .	32.7	65 57 40.4	. .	+ 2 4.7	117 6 6.3	. .
22	65 54	5.2	2.7	12.5	6.9	34	. .	. .	. .	. .	262	32.7	65 57 55.6	. .	+ 2 4.7	117 6 21.5	. .
23	346 34	9.2	5.5	15.4	11.0	32	205	195	. .	. .	. .	32.7	346 38 24.0	. .	— 13.3	37 44 31.9	+10.9
24	0 10	8.5	6.8	18.4	10.0	36	. .	. .	. .	150	155	32 7	0 13 23.2	. .	+ 0.2	51 19 44.6	+ 0.8
25	61 20	5.0	2.2	13.4	7.1	36	675	695	. .	. .	. .	32.7	61 23 17.8	. .	+ 1 42.3	112 31 21.3	— 6.2
26	306 6	4.3	1.5	10.0	7.6	38	. .	. .	480	. .	. .	32.7	306 8 51.9	. .	— 1 16.5	357 13 56.6	+ 1.9
27	17 34	4.6	3.6	14.6	7.2	39	060	040	. .	065	110	32.7	17 36 41.4	. .	+ 17.8	68 43 20.4	+ 6.8
28	25 8	10.1	8.0	20.5	12.8	32	075	085	. .	140	180	32.7	25 12 22.4	. .	+ 26.4	76 19 10.0	+ 1.7
29	57 58	6.5	3.5	15.5	8.6	31	455	495	. .	. .	. .	32.7	58 2 36.0	. .	+ 1 29.7	109 10 26.9	+ 3.5
30	70 50	8.0	5.2	15.0	9.8	34	360	382	. .	. .	. .	32.7	70 53 50.5	. .	+ 2 40.4	122 2 52.1	— 6.7
31	79 36	7.8	4.9	13.2	7.9	34	825	. .	. .	. .	. .	32.7	79 39 45.0	. .	+ 4 57.2	130 51 3.4	— 9.1
32	69 54	6.3	2.2	13.3	7.5	29	850	870	. .	. .	. .	32.7	69 59 1.8	. .	+ 2 32.8	121 7 55.8	— 5.3
33	65 24	4.0	29.5	11.1	5.2	29	. .	050	. .	. .	. .	32.7	65 31 49.7	. .	+ 2 2.8	116 40 13.7	— 3.7
34	65 24	4.0	29.5	11.1	5.2	31	. .	. .	. .	820	. .	32.7	65 26 2.2	. .	+ 2 2.2	116 34 25.6	— 3.6
35	65 24	4.0	29.5	11.1	5.2	36	. .	. .	. .	625	650	32.7	65 27 21.1	. .	+ 2 2.3	116 35 44.6	— 3.6
36	78 56	6.8	2.6	11.6	7.7	32	. .	332	. .	330	. .	32.7	79 0 24.4	. .	+ 4 40.6	130 11 26.2	— 6.1
37	358 32	7.2	5.4	15.9	10.2	31	815	830	. .	. .	. .	32.7	358 36 30.2	. .	— 1.4	49 42 50.0	+12.4
38	66 18	7.0	1.6	13.6	7.6	35	. .	930	. .	028	. .	32.7	66 21 28.4	. .	+ 2 7.6	117 29 57.2	— 1.9
39	0 42	6.2	5.0	16.0	8.2	33	. .	500	. .	565	. .	32.7	0 46 4.9	. .	+ 0.8	51 52 26.9	+12.4
40	0 42	6.2	5.0	16.0	8.2	30	. .	. .	. .	105	160	32.7	0 49 30.3	. .	+ 0.8	51 55 52.3	+12.4
41	75 10	9.7	5.8	16.0	10.8	29	765	780	. .	. .	. .	32.7	75 14 59.8	. .	+ 3 30.1	126 24 51.1	— 3.0
42	40 0	5.6	1.2	12.7	7.4	33	. .	120	. .	200	. .	32.7	40 4 12.5	. .	+ 47.3	91 11 21.0	+ 6.2
43	68 48	6.7	2.7	14.3	8.3	34	010	990	. .	. .	. .	32.7	68 51 57.7	. .	+ 2 24.5	120 0 43.4	— 0.4
44	358 58	8.1	5.9	16.4	9.5	33	770	772	. .	805	810	32.7	359 2 0.0	. .	— 1.0	50 8 20.2	+13.3
45	63 54	4.2	0.0	10.7	5.8	39	130	125	. .	. .	. .	32.7	63 56 42.1	. .	+ 1 54.8	115 4 58.1	+ 2.3
46	63 40	8.0	4.4	15.3	11.0	39	. .	975	. .	980	. .	32.7	63 39 52.1	. .	+ 1 53.3	114 48 6.6	+ 2.5
47	78 24	3.3	1.0	9.7	5.2	33	. .	070	. .	245	. .	32.7	78 28 14.2	. .	+ 4 28.8	129 39 4.2	0.0
48	346 18	7.5	5.8	15.2	9.2	36	975	960	. .	. .	. .	32.7	346 21 11.9	. .	— 13.7	37 27 19.4	+14.4
49	63 4	4.8	1.8	12.4	7.6	38	. .	. .	. .	980	940	32.7	63 6 43.8	. .	+ 1 50.8	114 14 55.8	+ 4.3

No.	Barom.	At. Ther.
	in.	°
2	30.15	76.9
10	30.19	76.1

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
1	— 4.8	+ 15 54.7	. .	+ 15 49.9
2	— 4.9	— 15 54.7	. .	— 15 59.6
3	— 4.1	. . .	0.0	— 4.1
15	—50 28.0	+ 14 53.6	. .	— 35 34.4
21	— 11.6	+ 7.6	. .	— 4.0
22	— 11.6	— 7.6	. .	— 19.2

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Sept. 8	1	B. A. C. 7286 . .	P.	20.3	23.4	25.3	33.3	36.0	38.6	46.5	48.6	52.0	55 36.00	− 0.81	. .	−65.04	20 54 30.15	− 4.22
	2	B. A. C. 7292 . .	P.	52.8	55.9	57.9	5.8	8.5	11.1	19.0	21.0	24.3	56 8.48	− 0.80	. .	−65.04	20 55 2.64	− 4.22
	3	Tran. Zones 182, 75	P.	1.9	4.5	6.4	12.9	15.1	17.4	24.0	25.5	28.2	9 15.10	− 0.64	. .	−65.05	21 8 9.41	− 3.59
	4	O. Arg. S. 21249 .	P.	40.0	42.5	44.2	50.8	53.0	55.3	1.8	3.3	6.3	9 53.02	− 0.64	. .	−65.05	21 8 47.33	− 3.60
	5	B. A. C. 7399 . .	P.	39.8	43.2	44.6	52.1	54.6	57.1	4.4	6.2	9.4	13 54.60	− 0.12	. .	−65.05	21 12 49.43	− 2.62
	6	1 Draconis, S. P. .	P.	. .	. .	46.4	32.0	16.8	3.0	48.8	. .	. .	20 17.40	− 4.73	. .	−65.09	9 19 7.58	+ 0.43
	7	B. A. C. 7475 . .	P.	35.7	38.9	40.5	48.0	50.5	53.0	0.6	2.4	5.5	25 50.57	− 0.76	. .	−65.06	21 24 44.75	− 4.08
	8	Saturn I, N. . .	P	19.2	21.8	23.5	. .	. .	. .	40.4	42.0	44.7	36 31.93	− 0.59	. .	−65.07	21 35 26.27	. .
	9	Saturn II, S. . .	P.	. .	. .	28.9	30.9	33.0	35.0	37.3	. .	. .	36 33.02	− 0.59	. .	−65.07	21 35 27.36	. .
	10	B. A. C. 7613 . .	P.	15.9	19.1	21.0	28.8	31.4	34.0	41.9	43.7	47.0	47 31.42	− 0.79	. .	−65.08	21 46 25.55	− 4.27
	11	B. A. C. 7632 . .	P.	45.9	48.9	50.9	58.7	1.2	3.9	11.5	13.4	16.8	50 1.24	− 0.80	. .	−65.08	21 48 55.36	− 4.27
	12	B. A. C. 7647 . .	P.	38.4	41.7	43.9	51.7	54.4	57.0	4.7	6.6	10.0	52 54.27	− 0.81	. .	−65.09	21 51 48.37	− 4.33
	13	B. A. C. 7673 . .	P.	6.9	9.9	11.6	18.8	21.1	23.4	30.5	32.3	35.3	58 21.09	− 0.72	. .	−65.09	21 57 15.28	− 3.96
	14	Anonymous . .	P.	19.7	22.4	24.0	30.4	32.6	34.6	41.0	42.7	45.6	0 32.56	− 0.60	. .	−65.09	21 59 26.87	− 3.56
	15	B. A. C. 7895 . .	P.	19.2	22.2	24.0	31.0	33.5	35.9	43 0	44.7	47.7	34 33.47	− 0.73	. .	−65.13	22 33 27.61	− 3.99
	16	B. A. C. 7909 . .	P.	20.5	23.4	25.0	32.0	34.4	37.0	44.0	45.7	48.7	36 34.52	− 0.71	. .	−65.13	22 35 28.69	− 3.94
	17	B. A. C. 7957 . .	P.	49.3	52.5	54.6	2.5	5.4	7.9	15.8	17.9	21.2	45 5.23	− 0.82	. .	−65.14	22 43 59.27	− 4.34
	18	B. A. C. 7966 . .	P.	29.7	32.7	34.6	41.9	44.4	46.8	54.1	55.9	59.0	46 44.34	− 0.75	. .	−65.14	22 45 38.45	− 4.06
	19	B. A. C. 7987 . .	P.	. .	. .	6.2	8.6	11.3	13.7	16.2	. .	. .	50 11.20	− 0.74	. .	−65.14	22 49 5.32	− 4.04
	20	B. A. C. 8025 . .	P.	29.5	32.7	34.6	42.0	44.6	47.1	54.5	56.5	59.6	57 44.57	− 0.77	. .	−65.15	22 56 38.65	− 4.12
	21	B. A. C. 8045 . .	P.	50.0	53.5	55.5	3.3	5.9	8.7	16.6	18.6	21.8	1 5.99	− 0.81	. .	−65.15	23 0 0.03	− 4.30
	22	Niobe	P.	28.2	30.6	32.4	36.3	40.8	45.1	49.8	51.3	54.0	17 40.94	− 0.30	. .	−65.17	23 16 35.47	. .
	23	ι Piscium . . .	P.	27.8	30.5	32.0	38.1	40.2	42.2	48.4	49.8	52.5	34 40.17	− 0.42	−65.24	−65.23	23 33 34.52	+ 0.01
	24	Weisse 839 . .	P.	59.8	2.3	3.9	10.0	12.0	14.0	20.4	21.7	34.3	43 12.04	− 0.51	. .	−65.20	23 42 6.33	− 3.28
	25	Groombridge 4163	P.	10.4	19.4	24.8	46.7	54.3	1.5	23.6	28.5	38.0	49 54.13	+ 1.44	. .	−65.25	23 48 50.32	− 0.06
	26	B. A. C. 8343 . .	P.	. .	. .	. .	. .	. .	31.9	37.0	39.2	42.6	56 26.39	− 0.83	. .	−65.21	23 55 20.35	− 4.15
	27	Eurydice . . .	P.	. .	8.4	10.6	12.6	14.5	16.6	21.0	22.6	25.3	2 12.68	− 0.47	. .	−65.22	0 1 6.99	. .
	28	γ Pegasi	P.	44.0	46.7	48.3	54.6	56.8	58.9	5.2	6.8	9.3	7 56.73	− 0.34	−65.30	−65.26	0 6 51.13	+ 0.04
	29	Concordia . . .	P.	49.0	51.5	53.2	57.0	58.7	1.5	. .	9.3	11.2	15 1.23	− 0.47	. .	−65.23	0 13 55.53	. .
	30	B. A. C. 104 . .	P.	10.5	13.8	15.7	23.8	26.4	29.4	37.3	39.3	42.7	23 26.43	− 0.82	. .	−65.24	0 22 20.37	− 3.99
	31	B. A. C. 136 . .	P.	30.8	34 0	35.8	43.4	45.8	48.4	56.0	58.0	1.1	28 45.92	− 0.77	. .	−65.24	0 27 39.91	− 3.79
	32	B. A. C. 166 . .	P.	33.2	36.1	37.9	45.0	47.3	49.7	56.7	58.6	1.6	33 47.34	− 0.17	. .	−65.25	0 32 41.92	− 3.02
	33	β Ceti.	P.	15.4	18.0	19.7	26.0	28.2	30.4	36.8	38.5	41.2	38 28.24	− 0.61	−65.41	−65.29	0 37 22.34	+ 0.17
	34	B. A. C. 259 . .	P.	42.3	45.4	47.4	55.0	57.6	0.2	8.0	9.9	13.2	50 57.67	− 0.07	. .	−65.27	0 49 52.33	− 3.05
	35	B. A. C. 272 . .	P.	30.3	33.1	35.0	42.0	44.4	46.8	53.9	55.6	58.7	53 44.42	− 0.71	. .	−65.27	0 52 38.44	− 3.50
	36	B. A. C. 289 . .	P.	23.4	26.2	28.0	35.3	37.7	40.1	47.4	49.2	52.2	57 37.72	− 0.73	. .	−65.27	0 56 31.72	− 3.53
	37	B. A. C. 332 . .	P.	14.6	17.3	18 9	25.1	27.2	29.3	35.6	37.0	39.7	3 27.19	− 0.55	. .	−65.28	1 2 21.36	− 3.15
	38	B. A. C. 355 . .	P.	11.5	14.6	16.3	23.5	25.9	28.3	35.7	37.5	40.6	6 25.99	− 0.74	. .	−65.28	1 5 19.97	− 3.49
	39	Polaris	P.	. .	. .	17.0	43.0	10.0	36.0	3.0	. .	. .	14 9.80	+24.23	. .	−65.34	1 13 28.69	− 4.13
	40	θ¹ Ceti	P.	43.0	45.8	47.3	53.4	55.5	57.6	3.7	5.2	7.9	18 55.49	− 0.53	−65.34	−65.34	1 17 49.62	+ 0.02
	41	B. A. C. 458 . .	P.	37.0	39.9	41.7	48.7	51.2	53.5	0.6	2.4	5.4	26 51.16	− 0.72	. .	−65.30	1 25 45.14	− 3.31
	42	B. A. C. 466 . .	P.	17.9	19.8	24.8	27.4	29.9	32.5	35.0	40.2	42.0	28 29.94	− 0.79	. .	−65.30	1 27 23.85	− 3.45
	43	B. A. C. 528 . .	P.	26.4	29.6	31.5	39.3	41.8	44.4	52.0	54.0	57.3	37 41.81	− 0.79	. .	−65.31	1 36 35.71	− 3.38
	44	B. A. C. 536 . .	P.	12.0	14.6	20.4	22.6	24.8	26.9	29.0	34.8	37.4	39 24.72	− 0.60	. .	−65.31	1 38 18.81	− 3.05
	45	B. A. C. 553 . .	P.	14.3	17.5	19.3	27.2	29.9	32.3	40.1	42.0	45.4	43 29.78	− 0.80	. .	−65.32	1 42 23.66	− 3.34
	46	β Arietis	P.	39.7	42.5	44.0	50.4	52.8	54.9	1.4	3.1	5.8	48 52.73	− 0.28	−65.28	−65.37	1 47 47.08	− 0 07
	47	B. A. C. 627 . .	P.	34.8	37.8	39.5	46.6	49.1	51.5	58.6	0.4	3.3	56 49.07	− 0.72	. .	−65.33	1 55 43.02	− 3.11
	48	α Arietis	P.	3.0	5.8	7.4	14.0	16.3	18.5	25.1	26.8	29.7	1 16.29	− 0.26	−65.33	−65.38	2 0 10.65	− 0.04
	49	Neptune . . .	P.	39.5	42.0	43.5	49.8	52.0	54.0	0.2	1.8	4.4	5 51.91	− 0.37	. .	−65.34	2 4 46.20	. .

1, 3. Wire B used.
2, 4, 14, 22, 27, 29. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° '	r. "	"	"	"							"	° ' "	°	' "	° "	"
1	77 50	10 8.8	4.5	12.9	8.7	38	685	650	. .	. .	. .	32.7	77 50 12.4	. .	+ 4 15.5	129 0 49.1	+ 2.0
2	77 50	8.8	4.5	12.9	8.7	34	. .	. .	. .	458	445	32.7	77 56 23.5	. .	+ 4 17.5	129 7 2.2	+ 2.0
3	60 42	5.6	3.7	14.4	8.1	45	295	280	. .	. .	. .	32.7	60 40 32.0	. .	+ 1 40.2	111 48 33.4	+ 7.0
4	60 42	5.6	3.7	14.4	8.1	31	. .	. .	. .	010	032	32.7	60 49 17.0	. .	+ 1 40.8	111 57 19.0	+ 7.0
5	4 28	3.5	1.8	12.5	5.6	38	. .	. .	. .	150	185	32.7	4 30 57.4	. .	+ 4.5	55 37 23.1	+14.6
6	300 44	3.5	1.2	10.3	6.6	35	. .	. .	550	. .	. .	32.7	300 47 37.2	. .	— 1 34.6	351 52 23.8	+ 0.4
7	73 16	7.6	4.0	14.4	9.2	33	435	450	. .	. .	. .	32.7	73 20 5.4	. .	+ 3 6.5	124 29 33.1	+ 6.3
8	54 38	3.2	0.2	11.1	4.3	30	520	. .	. .	. .	645	32.7	54 42 53.8	. .	+ 1 19.8	105 50 34.8	. .
9	54 38	3.2	0.2	11.1	4.3	29	. .	355	. .	440	. .	32.7	54 43 12.0	68.2	+ 1 19.8	105 50 53.0	. .
10	76 42	8.2	5.8	15.2	9.8	31	042	040	. .	. .	. .	32.7	76 46 41.2	. .	+ 3 55.8	127 56 58.2	+ 8.1
11	76 36	4.7	1.0	11.0	6.3	32	820	850	. .	. .	. .	32.7	76 40 17.9	. .	+ 3 54.0	127 50 33.1	+ 8.4
12	77 44	5.5	3.2	10.9	6.6	31	. .	140	. .	230	. .	32.7	77 48 42.6	. .	+ 4 15.7	128 59 19.5	+ 8.6
13	69 18	6.2	3.1	14.1	7.6	32	930	955	. .	. .	. .	32.7	69 22 14.2	. .	+ 2 29.0	120 31 4.4	+10.5
14	56 18	4.2	1.4	12.0	6.4	34	. .	. .	. .	455	480	32.7	56 24 26.2	. .	+ 1 25.0	107 32 12.4	+12.4
15	70 6	5.3	0.8	11.1	6.5	37	930	960	. .	. .	. .	32.7	70 8 59.4	. .	+ 2 35.4	121 17 56.0	+14.1
16	68 48	6.5	2.4	14.4	9.0	34	750	740	. .	. .	. .	32.7	68 51 46.2	. .	+ 2 25.4	120 0 32.8	+14.5
17	78 34	7.0	3.1	12.1	7.8	33	905	950	. .	. .	. .	32.7	78 37 59.2	. .	+ 4 33.9	129 48 54.3	+14.4
18	72 18	6.6	2.8	13.4	8.6	31	. .	090	. .	120	. .	32.7	72 22 42.6	. .	+ 2 56.3	123 32 0.1	+15.2
19	72 0	6.0	1.0	11.6	6.2	38	. .	. .	. .	285	275	32.7	72 2 54.6	. .	+ 2 52.9	123 12 8.7	+15.5
20	74 12	7.2	3.2	13.0	9.0	35	515	540	. .	. .	. .	32.7	74 15 34.2	. .	+ 3 18.0	125 25 13.4	+16.1
21	78 18	9.0	4.4	14.0	8.3	29	935	920	. .	. .	. .	32.7	78 22 59.0	. .	+ 4 28.3	129 33 48.5	+16.1
22	19 56	4.5	3.0	15.2	7.5	34	780	805	. .	780	800	32.7	20 2 19.8	. .	+ 20.7	71 9 1.7	— 1.4
23	33 52	5.7	2.6	14.1	8.3	34	850	840	. .	890	905	32.7	33 55 45.4	. .	+ 38.1	85 2 44.7	+ 0.6
24	44 12	6.2	3.1	13.3	8.5	37	510	520	. .	. .	. .	32.7	44 15 4.4	. .	+ 55.2	95 22 20.8	+20.3
25	325 8	0.2	0.0	10.5	6.1	37	. .	. .	080	. .	. .	32.7	325 11 15.0	. .	— 39.4	16 16 56.8	— 0.1
26	79 36	4.4	1.7	10.4	5.7	38	. .	. .	. .	190	. .	32.7	79 38 54.1	67.1	+ 5 0.1	130 50 15.4	+21.6
27	40 10	7.8	3.9	15.7	8.7	36	. .	. .	. .	245	. .	32.7	40 15 56.1	67.1	+ 48.0	91 23 5.3	— 6.5
28	24 20	7.9	5.2	15.8	8.9	35	390	400	. .	420	430	32.7	24 23 35.4	. .	+ 25.7	75 30 22.3	+ 1.3
29	39 32	5.6	2.5	14.3	7.7	32	. .	675	. .	. .	630	32.7	39 38 52.4	. .	+ 47.0	90 46 0.6	— 3.1
30	79 20	9.0	5.7	14.8	9.9	30	892	890	. .	. .	. .	32.7	79 24 43.3	. .	+ 4 53.9	130 35 58.4	+24.1
31	74 26	5.5	1.8	12.2	7.1	32	615	650	. .	. .	. .	32.7	74 30 20.0	. .	+ 3 21.6	125 40 2.8	+24.5
32	8 38	4.3	2.9	14.6	6.9	31	550	560	. .	. .	. .	32.7	8 42 36.6	. .	+ 8.7	59 49 6.5	+17.2
33	57 28	2.5	1.0	12.6	6.9	33	390	410	. .	475	478	32.7	57 32 9.0	. .	+ 1 29.0	108 39 59.2	+ 0.9
34	1 0	10.5	9.1	20.5	13.4	33	068	070	. .	. .	. .	32.7	1 4 7.3	. .	+ 1.1	52 10 29.6	+15.5
35	68 48	6.1	2.6	14.6	8.8	30	. .	820	. .	885	. .	32.7	68 52 46.4	. .	+ 2 25.7	120 1 33.3	+26.0
36	71 0	7.5	4.9	14.4	9.7	33	780	825	. .	. .	. .	32.7	71 3 59.6	. .	+ 2 43.9	122 13 4.7	+26.4
37	49 38	3.6	1.1	12.3	7.1	30	650	660	. .	. .	. .	32.7	49 42 51.1	. .	+ 1 6.9	100 50 19.2	+24.5
38	71 42	7.9	5.4	14.9	10.3	36	. .	975	. .	995	. .	32.7	71 45 10.8	. .	+ 2 50.4	122 54 22.4	+27.0
39	310 12	9.1	7.2	16.8	12.9	33	265	205	245	215	210	32.7	310 16 6.8	. .	— 1 6.9	1 21 21.1	0.0
40	47 38	7.8	4.8	14.2	9.2	33	995	980	. .	065	072	32.7	47 41 56.8	. .	+ 1 2.3	98 49 20.3	+ 2.0
41	69 24	5.9	0.4	11.3	6.9	31	960	015	. .	. .	. .	32.7	69 28 30.4	. .	+ 2 30.4	120 37 22.0	+28.0
42	76 16	6.5	2.7	11.8	7.3	34	. .	. .	. .	625	660	32.7	76 19 49.4	. .	+ 3 49.0	127 29 59.6	+28.7
43	76 14	5.7	2.5	11.9	6.8	37	175	200	. .	. .	. .	32.7	76 17 10.1	. .	+ 3 48.3	127 27 19.6	+29.2
44	55 24	4.3	1.5	13.5	7.2	35	. .	470	. .	475	. .	32.7	55 27 37.1	. .	+ 1 22.4	106 35 20.7	+26.7
45	76 32	5.5	3.0	12.7	8.4	32	630	645	. .	. .	. .	32.7	76 36 19.1	. .	+ 3 53.7	127 46 34.0	+29.5
46	18 38	6.8	5.5	17.0	9.3	36	740	730	. .	735	725	32.7	18 41 15.1	. .	+ 19.2	69 47 55.5	+ 1.3
47	69 22	7.4	3.3	14.1	9.8	30	415	460	. .	. .	. .	32.7	69 26 51.6	. .	+ 2 30.3	120 35 43.1	+29.4
48	15 58	4.2	2.8	14.7	7.1	38	420	402	. .	415	428	32.7	16 0 51.8	. .	+ 16.3	67 7 29.3	+ 1.2
49	28 4	6.0	4.3	14.7	8.8	33	285	240	. .	335	340	32.7	28 8 8.7	. .	+ 30.4	79 15 0.3	. .

No.	Barom.	At. Ther.
	in.	°
9	30.22	69.2
26	30.22	68.2
27	30.22	68.2

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
8	— 0.8	+ 9.1	. .	+ 8.3
9	— 0.8	— 9.1	. .	— 9.9
49	— 0.1	. .	. .	— 0.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Sept. 8	1	B. A. C. 713	P.	56.1	59.2	1.0	8.7	11.3	13.9	21.4	23.3	26.5	13 11.27	− 0.78	. .	−65.35	2 12 5.14	− 3.07
	2	B. A. C. 746	P.	50.9	54.0	56.0	3.9	6.6	9.1	16.8	18.7	22.0	19 6.44	− 0.80	. .	−65.35	2 18 0.29	− 3.04
	3	B. A. C. 783	P.	59.6	2.8	4.6	9.7	12.3	14.8	17.4	20.0	. .	28 14.86	− 0.78	. .	−65.36	2 27 8.72	− 2.94
	4	B. A. C. 788	P.	51.6	53.4	58.2	0.8	3.4	5.9	8.4	13.3	15.3	29 3.37	− 0.76	. .	−65.36	2 27 57.25	− 2.92
	5	B. A. C. 812	P.	50.0	53.0	54.8	2.0	4.3	6.6	13.7	15.5	18.5	34 4.27	− 0.72	. .	−65.37	2 32 58.18	− 2.83
	6	B. A. C. 832	P.	37.2	40.3	42.4	50.3	53.1	55.8	4.0	5.9	9.3	36 53.14	− 0.82	. .	−65.37	2 35 46.95	− 2.91
	7	B. A. C. 871	P.	34.8	38.6	40.0	47.7	50.4	53.0	0.7	2.6	5.8	43 50.33	− 0.07	. .	−65.38	2 42 44.88	− 2.94
10	8	B. A. C. 3453	F.	28.7	31.3	32.8	37.2	39.2	41.7	43.7	45.6	. .	0 41.47	− 0.39	. .	− 9.08	10 0 32.00	− 1.04
	9	γ^1 Leonis	F.	2.2	4.8	6.5	13.0	15.4	17.4	24.0	25.5	28.2	13 15.22	− 0.35	− 9.12	− 9.08	10 13 5.79	+ 0.02
	10	α Ursæ Majoris	F.	43.0	48.3	51.5	4.8	9.4	13.6	26.9	30.0	35.9	56 9.27	+ 0.56	. .	− 9.12	10 56 0.71	− 0.02
11	11	Sun I, N.	F.	40.4	43.0	44.6	50.6	52.8	54.8	1.1	2.6	5.1	16 52.78	− 0.51	. .	− 9.15	11 16 43.12	. .
	12	Sun II, S.	F.	48.8	51.3	52.9	58.9	1.1	3.1	9.1	10.8	13.3	19 1.03	− 0.51	. .	− 9.15	11 18 51.37	. .
	13	Mercury I, N.	F.	. .	. .	17.9	19.8	22.0	23.8	26.0	. .	. .	19 21.90	− 0.58	. .	− 9.21	12 19 12.11	+ 0.18
	14	Mercury, S.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	15	12 Canum Venat.	F.	. .	. .	. .	21.0	23.4	26.0	31.4	33.5	36.6	50 20.87	− 0.10	− 9.21	− 9.23	12 50 11.54	− 0.02
	16	Polaris, S. P.	F.	. .	. .	3.0	37.0	10.0	43.0	14.0	. .	. .	14 9.40	−26.88	. .	− 9.25	1 13 33.27	− 0.69
	17	α Virginis	F.	35.0	37.6	39.0	45.3	47.5	49.6	55.8	57.3	0.0	18 47.46	− 0.65	− 9.37	− 9.26	13 18 37.55	+ 0.09
	18	η Ursæ Majoris	F.	27.8	31.6	34.0	43.3	46.5	50.0	59.3	1.7	5.6	42 46.64	+ 0.12	. .	− 9.29	13 42 37.47	− 0.07
	19	η Bootis	F.	44.4	45.9	50.3	52.4	54.6	56.6	58.9	3.3	4.8	48 54.58	− 0.37	− 9.21	− 9.29	13 48 44.92	− 0.13
	20	α Bootis	F.	55.3	58.0	59.6	6.1	8.3	10.4	17.0	18.6	21.3	10 8.29	− 0.36	− 9.30	− 9.31	14 9 58.62	− 0.01
	21	θ Bootis	F.	46.0	50.3	52.9	2.6	6.2	9.6	19.7	22.0	26.5	21 6.20	+ 0.19	. .	− 9.33	14 20 57.06	0.00
	22	Moon I, S.	F.	39.9	42.6	44.4	51.1	53.6	55.9	2.7	4.5	7.3	38 53.56	− 0.80	. .	− 9.65	20 38 43.11	+69.36
	23	ζ Cygni	F.	. .	. .	. .	. .	. .	. .	59.0	0.7	3.7	7 49.56	− 0.24	− 9.70	− 9.74	21 7 39.58	− 0.03
14	24	δ Aquilæ	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	25	γ Aquilæ	P.	23.6	26.0	27.7	33.9	36.0	38.1	44.2	45.9	48.4	40 35.98	− 0.52	−13.90	−13.90	19 40 21 56	+ 0.03
	26	α Aquilæ	P.	45.8	48.4	49.9	56.0	58.1	0.2	6.4	7.9	10.5	44 58.13	− 0.53	−13.92	−13.90	19 44 43.70	+ 0.06
	27	λ Ursæ Minoris	P.	. .	. .	. .	. .	40.0	28.0	20.5	. .	. .	48 39.44	+35.54	. .	−13.91	19 49 1.07	− 0.71
	28	B. A. C. 6877	P.	27.8	30.9	32.6	40.0	42.3	44.7	52.0	53.7	56.7	56 42.30	− 0.97	. .	−13.92	19 56 27.41	− 3.61
	29	B. A. C. 6922	P.	2.4	5.7	7.5	15.0	17.7	20.3	27.9	29.9	33.0	3 17.71	− 1.04	. .	−13.93	20 3 2.74	− 3.81
	30	B. A. C. 6948	P.	8.8	11.6	13.5	20.7	22.9	25.3	32.5	34.1	37.2	8 22.96	− 0.94	. .	−13.93	20 8 8.09	− 3.60
	31	Weisse (2) 538.	P.	. .	6.2	8.2	10.4	12.5	14.7	19.0	20.7	23.4	16 10.40	− 0.41	. .	−13.94	20 15 56.05	− 2.54
	32	B. A. C. 7036	P.	49.0	52.2	54.0	1.6	4.0	6.5	14.1	15.9	19.2	21 4.06	− 1.01	. .	−13.94	20 20 49.11	− 3.88
	33	Mural Zones 64, 16	P.	29.4	32.3	34.0	40.8	42.9	45.2	52.0	53.6	56.4	28 42.96	− 0.87	. .	−13.95	20 27 28.14	− 3.51
	34	B. A. C. 7149	P.	. .	. .	2.8	4.8	7.0	9.2	11.1	. .	. .	34 6.98	− 0.46	. .	−13.95	20 33 52.57	− 2.67
	35	B. A. C. 7155	P.	. .	. .	. .	0.7	3.3	6.0	11.4	13.2	16.6	35 0.66	− 1.07	. .	−13.95	20 34 45.64	− 4.13
	36	B. A. C. 7218	P.	39.5	43.7	46.1	56.3	59.6	3.0	13.2	15.6	19.8	42 59.64	+ 0.20	. .	−13.96	20 42 45.88	− 2.18
	37	ν Cygni	P.	31.0	34.6	36.5	44.6	47.3	50.0	58.0	0.1	3.5	52 47.29	− 0.10	−13.96	−13.97	20 52 33.22	+ 0.05
	38	61^1 Cygni	P.	18.9	22.1	24.2	32.0	34.6	37.2	44.9	47.0	50.2	1 34.57	− 0.14	−14.01	−13.97	21 1 20.46	0.00
	39	B. A. C. 7349	P.	14.9	18.2	20.2	28.4	31.0	33.7	41.7	43.8	47.2	4 31.01	− 1.08	. .	−13.98	21 4 15.95	− 4.29
	40	Tran. Zones 182, 75	P.	11.1	13.6	15.5	22.0	24.0	26.3	33.0	34.6	37.4	8 24.17	− 0.84	. .	−13.98	21 8 9.35	− 3.56
	41	O. Arg. S. 21249	P.	48.9	51.7	53.4	59.9	2.1	4.3	11.0	12.6	15.4	9 2.14	− 0.84	. .	−13.98	21 8 47.32	− 3.56
	42	d Ursæ Majoris, S. P.	P.	18.6	10.9	6.6	48.3	42.2	36.2	17.7	13.4	5.7	23 42.18	− 2.64	. .	−13.99	9 23 25.55	+ 0.29
	43	ξ Aquarii	P.	11.5	14.0	15.6	21.8	23.9	25.9	32.0	33.6	36.2	31 23.83	− 0.70	−14.07	−14.00	21 31 9.13	+ 0.09
	44	Saturn I, N.	P.	1.5	4.3	6.0	. .	. .	. .	22.8	24.5	27.0	34 14.35	− 0.78	. .	−14.00	21 33 59.57	. .
	45	Saturn II, S.	P.	. .	. .	11.2	13.3	15.5	17.6	19.8	. .	. .	34 15.48	− 0.78	. .	−14.00	21 34 0.70	. .
	46	11 Cephei	P.	. .	. .	14.0	20.0	26.5	32.5	45.0	49.5	57.2	40 20.07	+ 1.23	. .	−14.01	21 40 7.29	− 0.30
	47	B. A. C. 7613	P.	25.3	28.2	30.0	38.0	40.6	43.3	50.7	52.8	56.0	46 40.54	− 1.04	. .	−14.01	21 46 25.49	− 4.25

6. Telescope micrometer reading decreased one revolution in reduction.
10. Bisections at sets B and D.
33, 40. Wire B used.
41. Wire A used.
46. Bisections at wires V and VI.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	75 20	10 6.6	3.4	13.3	9.0	36	105	180	. .	. .	. .	32.7	75 23 24.8	. .	+ 3 34.3	126 33 20.3	+30.7
2	76 54	7.2	3.1	13.3	8.2	34	615	700	. .	. .	. .	32.7	76 57 47.6	. .	+ 4 0.2	128 8 9.0	+31.1
3	75 44	6.0	1.2	12.1	7.0	32	755	805	. .	. .	. .	32.7	75 48 17.7	. .	+ 3 40.7	126 58 19.6	+31.2
4	73 58	8.5	4.8	14.7	9.5	34	. .	. .	. .	180	210	32.7	74 1 54.0	. .	+ 3 15.8	125 11 31.0	+31.0
5	69 30	7.3	3.2	14.3	8.4	31	410	480	. .	. .	. .	32.7	69 34 36.6	. .	+ 2 31.4	120 43 29.2	+30.5
6	79 8	6.2	2.6	11.8	7.4	35	705	755	. .	. .	. .	32.7	79 11 47.5	. .	+ 4 48.7	130 22 57.4	+31.9
7	1 2	8.8	8.1	19.2	12.6	36	. .	508	. .	540	. .	32.7	1 5 15.8	65.3	+ 1.1	52 11 38.1	+12.7
8	21 28	2.5	3.2	15.1	9.6	37	. .	. .	. .	722	. .	29.3	21 30 58.8	58.4	+ 22.9	72 37 42.9	— 0.6
9	18 20	3.5	3.3	15.4	10.2	29	. .	890	. .	902	. .	29.3	18 24 57.9	. .	+ 19.3	69 31 38.4	+ 0.9
10	336 24	9 23.4	19.8	5.4	0.9	31	608	. .	. .	. .	620	29.3	336 28 42.3	. .	— 25.2	27 34 38.3	+ 1.6
11	34 0	10 5.4	29.8	12.5	7.5	31	745	655	. .	. .	. .	29.3	34 4 32.1	. .	+ 39.0	85 11 32.3	. .
12	34 32	9 29.6	26.2	7.8	3.8	32	. .	. .	. .	505	530	29.3	34 36 23.7	. .	+ 39.8	85 43 24.7	. .
13	40 48	26.8	24.0	8.8	1.7	32	690	. .	. .	. .	620	29.3	40 52 23.2	. .	+ 49.8	91 59 34.2	. .
14	40 48	26.8	24.0	8.8	1.7	32	. .	154	. .	168	. .	29.3	40 52 30.8	. .	+ 49.8	91 59 41.8	. .
15	359 50	10 1.2	1.2	14.7	7.4	33	. .	. .	. .	426	434	29.3	359 54 6.4	. .	— 0.1	51 0 27.5	+ 2.3
16	307 30	2.5	1.4	12.6	9.6	35	390	386	375	370	370	29.3	307 33 35.3	63.0	— 1 14.6	358 38 41.9	+ 2.1
17	49 18	9 27.6	25.9	9.2	2.2	29	. .	. .	. .	470	484	29.3	49 23 11.3	. .	+ 1 6.9	100 30 39.4	+ 1.3
18	348 54	10 1.0	29.1	11.9	5.4	35	. .	. .	. .	324	346	29.3	348 57 39.2	. .	— 11.2	40 3 49.2	+ 3.2
19	19 48	0.2	0.1	14.7	5.8	34	. .	. .	. .	280	. .	29.3	19 51 53.9	. .	+ 20.7	70 58 35.8	+ 2.7
20	19 0	1.7	1.0	14.8	7.0	36	. .	324	. .	320	. .	29.3	19 3 21.4	. .	+ 19.8	70 10 2.4	+ 1.0
21	346 24	9 29.7	28.7	10.2	4.7	33	. .	450	. .	528	. .	29.3	346 28 7.9	64.2	— 13.8	37 34 15.8	+ 0.5
22	63 6	10 5.3	1.8	14.7	9.1	36	. .	870	015	340	. .	31.1	63 9 9.9	. .	+ 1 54.8	114 17 25.9	. .
23	9 6	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	55.0	. .	. . . .	. .
24	35 56	2.3	27.8	9.0	3.4	30	650	675	. .	750	740	30.5	36 0 51.6	. .	+ 41.1	87 7 53.9	+ 1.2
25	28 30	5.1	1.5	11.2	8.6	32	275	295	. .	275	272	30.5	28 34 24.1	68.0	+ 30.9	79 41 16.2	+ 0.9
26	30 16	3.1	29.8	9.3	4.2	31	605	630	. .	698	702	30.5	30 20 36.0	. .	+ 33.2	81 27 30.4	+ 1.6
27	309 54	1.0	29.8	8.4	5.8	31	. .	. .	200	238	250	30.5	309 58 43.1	. .	— 1 7.6	1 3 56.7	+ 0.4
28	71 12	5.5	1.5	11.4	7.2	36	820	815	. .	. .	. .	30.5	71 15 14.0	. .	+ 2 45.6	122 24 20.8	— 3.1
29	75 10	5.2	0.5	10.2	6.9	30	070	090	. .	. .	. .	30.5	75 14 57.8	. .	+ 3 32.4	126 24 51.4	— 3.6
30	69 10	5.6	1.7	11.7	7.5	32	790	840	. .	. .	. .	30.5	69 14 15.1	. .	+ 2 28.7	120 23 5.0	— 1.3
31	19 32	4.8	2.8	13.8	7.8	29	. .	. .	. .	350	. .	30.5	19 34 35.4	. .	+ 20.2	70 41 16.8	+11.6
32	74 46	5.5	1.1	11.3	7.8	31	540	570	. .	. .	. .	30.5	74 50 34.5	. .	+ 3 26.8	126 0 22.5	— 1.6
33	63 40	7.0	3.6	13.8	10.6	39	. .	945	. .	920	. .	30.5	63 39 51.6	65.4	+ 1 54.6	114 48 7.4	+ 2.1
34	23 20	7.5	3.9	15.2	9.1	30	915	912	. .	. .	. .	30.5	23 24 42.4	. .	+ 24.6	74 31 28.2	+11.9
35	78 46	5.8	1.1	10.3	7.4	37	. .	. .	. .	095	078	30.5	78 49 10.7	. .	+ 4 40.0	130 0 11.9	— 1.2
36	346 18	7.0	2.7	11.6	7.6	37	165	135	. .	. .	. .	30.5	346 21 9.1	. .	— 13.8	37 27 16.5	+15.9
37	358 8	5.0	2.5	12.6	8.2	32	960	960	. .	000	045	30.5	358 12 13.0	. .	— 1.8	49 18 32.4	+ 1.9
38	0 42	4.1	1.2	12.8	7.0	37	070	040	. .	050	080	30.5	0 45 11.5	. .	+ 0.8	51 51 33.5	+ 0.8
39	79 30	6.0	1.4	10.3	7.7	30	. .	. .	. .	400	408	30.5	79 34 52.8	. .	+ 5 0.2	130 46 14.2	+ 1.9
40	60 42	5.4	2.6	13.6	10.0	45	. .	210	. .	. .	. .	30.5	60 40 31.3	. .	+ 1 41.3	111 48 33.8	+ 6.7
41	60 42	5.4	2.6	13.6	10.0	31	. .	. .	. .	005	010	30.5	60 49 15.1	. .	+ 1 41.9	111 57 18.2	+ 6.7
42	289 14	6.3	4.6	13.2	9.9	30	. .	365	. .	430	. .	30.5	289 18 50.0	. .	— 2 41.4	340 22 29.8	+ 0.5
43	47 14	7.0	2.6	13.5	8.0	36	670	705	. .	. .	. .	30.5	47 17 14.9	. .	+ 1 1.8	98 24 37.9	+ 0.8
44	54 46	3.0	28.6	11.6	5.6	34	140	. .	. .	. .	240	30.5	54 49 56.4	. .	+ 1 20.9	105 57 38.5	. .
45	54 46	3.0	28.6	11.6	5.6	33	. .	060	. .	090	. .	30.5	54 50 13.6	. .	+ 1 21.0	105 57 55.8	. .
46	328 6	0.5	28.2	8.4	5.6	34	. .	. .	. .	840	892	30.5	328 9 48.6	. .	— 35.5	19 15 34.3	— 0.8
47	76 42	6.5	1.6	11.5	8.2	31	185	192	. .	. .	. .	30.5	76 46 39.6	. .	+ 3 58.3	127 56 59.1	+ 7.3

No.	Barom.	At. Ther.
	in.	°
7	30.20	66.6
8	30.38	58.0
16	30.36	64.0
21	30.35	64.0
23	30.38	58.0
25	30.27	69.9
33	30.25	67.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
11	— 5.0	+ 15 56.2	. .	+ 15 51.2
12	— 5.0	— 15 56.2	. .	— 16 1.2
13	— 4.4	+ 3.8	. .	— 0.6
14	— 4.4	— 3.8	0.0	— 8.2
22	—50 2.4	— 15 21.2	. .	— 1 5 23.6
44	— 0.8	+ 8.7	. .	+ 7.9
45	— 0.8	— 8.6	. .	— 9.4

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Sept. 14	1	B. A. C. 7635 . .	P.	36.1	38.2	43.3	45.8	48.4	51.1	53.6	58.9	0.8	49 48.47	— 1.05	. .	—14.01	21 49 33.41	— 4.28
	2	B. A. C. 7673 . .	P.	16.0	18.8	20.7	27.9	30.2	32.5	39.7	41.4	44.4	57 30.17	— 0.94	. .	—14.02	21 57 15.21	— 3.95
	3	Anonymous . .	P.	31.4	33.0	37.2	39.3	41.6	43.8	45.9	50.1	51.7	59 41.56	— 0.80	. .	—14.02	21 59 26.74	— 3.55
	4	Mur. Zones 207, 70	P.	41.8	44.4	46.0	52.4	54.5	56.8	2.8	4.6	7.3	10 54.51	— 0.79	. .	—14.03	22 10 39.69	— 3.55
	5	Mur. Zones 207, 71	P.	. .	. .	. .	. .	. .	. .	8.0	9.5	12.3	10 59.45	— 0.79	. .	—14.03	22 10 44.63	— 3.55
	6	B. A. C. 8002 . .	P.	50.2	53.0	54.8	1.9	4.3	6.7	13.7	15.4	18.5	53 4.28	— 0.94	. .	—14.07	22 52 49.27	— 3.95
	7	B. A. C. 8025 . .	P.	38.6	41.9	43.6	51.0	53.7	56.3	3.7	5.6	8.7	56 53.68	— 1.01	. .	—14.07	22 56 38.60	— 4.15
	8	B. A. C. 8045 . .	P.	59.5	2.6	4.5	12.5	15.0	17.8	25.7	27.7	31.0	0 15.14	— 1.06	. .	—14.07	23 0 0.01	— 4.33
	9	Niobe	P.	30.4	. .	. .	. .	. .	. .	51.9	. .	. .	10 43.31	— 0.42	. .	—14.08	23 10 28.81	. .
	10	Moon I, S. . . .	P.	36.4	39.0	40.6	46.9	49.1	51.2	57.5	59.0	1.6	16 49.03	— 0.69	. .	—14.08	23 16 34.26	+66.53
	11	γ Cephei	P.	36.0	47.3	54.6	21.6	30.5	39.4	6.6	13.2	14.7	34 30.43	+ 2.17	. .	—14.12	23 34 18.48	+ 0.29
	12	Weisse 839 . .	P.	8.9	11.5	13.0	19.0	21.1	23.1	29.3	30.9	33.4	42 21.13	— 0.67	. .	—14.10	23 42 6.34	— 3.34
	13	Eurydice . . .	P.	21.8	24.5	25.9	32.0	34.0	36.2	42.2	43.9	46.6	56 34.12	— 0.63	. .	—14.10	23 56 19.39	. .
	14	B. A. C. 166 . .	P.	42.0	45.0	46.9	53.9	56.4	58.8	5.8	7.5	10.5	32 56.31	— 0.27	. .	—14.13	0 32 41.91	— 3.11
	15	B. A. C. 192 . .	P.	45.3	48.5	50.5	58.4	0.8	3.8	11.5	13.4	16.8	37 1.00	— 1.06	. .	—14.13	0 36 45.81	— 3.95
	16	B. A. C. 202 . .	P.	12.5	15.9	17.9	25.8	28.3	31.0	38.9	40.8	44.2	38 28.37	— 1.06	. .	—14.13	0 38 13.18	— 3.94
	17	32¹ Camelopard., S. P.	P.	. .	. .	2.4	41.0	21.9	2.5	41.3	. .	. .	48 21.82	— 7.26	. .	—14.14	12 48 0.42	+ 5.11
	18	32² Camelopard., S. P.	P.	. .	. .	10.2	50.0	30.3	9.7	49.0	. .	. .	48 29.84	— 7.26	. .	—14.18	12 48 8.40	— 0.27
	19	B. A. C. 303 . .	P.	29.8	32.3	33.9	40.0	42.0	44.1	50.3	51.8	54.4	58 42.07	— 0.57	. .	—14.15	0 58 27.35	— 3.14
	20	B. A. C. 334 . .	P.	. .	. .	56.8	59.3	1.7	4.2	. .	. .	. .	3 1.75	— 0.19	. .	—14.15	1 2 47.41	— 3.15
	21	Polaris	P.	. .	. .	32.0	51.0	20.5	48.0	10.5	. .	. .	13 20.40	+27.68	. .	—14.21	1 13 33.87	— 1.40
	22	θ¹ Ceti	P.	52.3	54.9	56.4	2.6	4.7	6.7	12.8	14.4	17.1	18 4.66	— 0.71	—14.22	—14.24	1 17 49.71	0.00
	23	β Arietis	P.	48.9	51.5	53.2	59.7	1.8	4.0	10.5	12.3	15.0	48 1.88	— 0.40	—14.18	—14.24	1 47 47.24	— 0.04
	24	B. A. C. 609 . .	P.	49.9	52.4	54.0	0.2	2.2	4.3	10.5	12.0	14.7	53 2.24	— 0.50	. .	—14.19	1 52 47.55	— 3.01
	25	α Arietis	P.	12.1	14.9	16.6	23.3	25.3	27.6	34.2	35.9	38.8	0 25.41	— 0.37	—14.19	—14.25	2 0 10.79	— 0.05
	26	Neptune . . .	P.	23.5	26.0	27.6	33.9	35.9	38.0	44.4	45.8	48.5	4 35.96	— 0.51	. .	—14.20	2 4 21.25	. .
19	27	ε Leonis	P.	54.6	57.4	59.0	5.7	8.0	10.3	17.0	18.4	21.4	39 7.98	— 0.35	—21.11	—21.06	9 38 46.57	— 0.01
	28	α Leonis	P.	53.0	55.7	57.3	3.4	5.6	7.7	14.0	15.5	18.2	2 5.60	— 0.56	—21.11	—21.08	10 1 43.96	— 0.01
	29	γ¹ Leonis	P.	14.4	17.2	18.8	25.3	27.5	29.7	36.3	37.9	40.6	13 27.52	— 0.43	—21.19	—21.09	10 13 6.00	+ 0.08
	30	α Ursæ Majoris . .	P.	. .	. .	. .	. .	. .	. .	38.8	42.4	47.7	56 21.21	+ 1.02	. .	—21.13	10 56 1.10	+ 0.21
20	31	XVIII, 3 . . .	P.	3.9	6.4	8.2	14.6	16.8	18.9	25.4	27.0	29.7	5 16.77	— 1.12	. .	—21.56	18 4 54.09	— 2.47
	32	XVIII, 5 . . .	P.	29.5	32.2	33.8	40.2	42.5	44.6	51.3	52.8	55.5	6 42.49	— 1.14	. .	—21.56	18 6 19.79	— 2.51
	33	XVIII, 6 . . .	P.	. .	49.4	51.6	53.9	56.3	58.7	3.4	5.0	8.0	9 54.01	— 1.28	. .	—21.56	18 9 31.17	— 2.68
	34	B. A. C. 6235 . .	P.	37.1	40.1	42.0	49.7	52.2	54.8	2.4	4.1	7.3	15 52.19	— 0.17	. .	—21.57	18 15 30.45	— 1.55
	35	B. A. C. 6245 . .	P.	. .	. .	. .	. .	. .	. .	50.2	51.8	54.5	17 41.62	— 0.54	. .	—21.57	18 17 19.51	— 1.91
	36	1 Aquilæ	P.	36.8	39.4	40.9	47.1	49.3	51.4	57.5	59.0	1.6	28 49.22	— 0.94	—21.57	—21.58	18 28 26.70	+ 0.06
	37	B. A. C. 6350 . .	P.	. .	. .	. .	. .	32.4	35.5	42.3	44.8	48.9	31 28.91	+ 0.34	. .	—21.59	18 31 7.66	— 1.17
	38	XVIII, 16 . . .	P.	. .	. .	19.8	22.3	24.7	27.0	29.4	. .	. .	33 24.64	— 1.31	. .	—21.59	18 33 1.74	— 2.91
	39	XVIII, 17 . . .	P.	. .	. .	. .	. .	. .	. .	30.2	31.8	34.8	34 21.18	— 1.21	. .	—21.59	18 33 58.38	— 2.78
	40	B. A. C. 6397 . .	P.	41.3	44.0	45.5	52.0	54.2	56.4	2.7	4.4	7.1	41 54.18	— 0.53	. .	—21.59	18 41 32.06	— 2.03
	41	B. A. C. 6426 . .	P.	. .	. .	. .	30.4	32.8	35.2	40.3	42.0	44.9	45 30.42	— 0.25	. .	—21.60	18 45 8.57	— 1.77
	42	ζ Aquilæ	P.	51.6	54.3	55.9	2.1	4.2	6.3	12.6	14.3	16.9	0 4.24	— 0.60	—21.56	—21.61	18 59 42.03	+ 0.03
	43	B. A. C. 6594 . .	P.	35.4	38.3	40.2	47.2	49.8	52.2	59.5	1.2	4.3	12 49.79	— 1.34	. .	—21.62	19 12 26.83	— 3.23
	44	B. A. C. 6622 . .	P.	23.6	27.1	29.0	37.0	39.8	42.7	50.7	52.8	56.0	15 39.86	— 1.54	. .	—21.62	19 15 16.70	— 3.57
	45	δ Aquilæ	P.	24.6	27.0	28.5	34.5	36.6	38.8	44.8	46.3	49.0	19 36.68	— 0.77	—21.69	—21.63	19 19 14.28	+ 0.11
	46	Anonymous . .	P.	0.9	3.6	5.5	12.5	14.6	17.0	23.8	25.6	28.4	28 14.66	— 1.24	. .	—21.63	19 27 51.79	— 3.17
	47	Anonymous . .	P.	37.9	41.0	42.6	. .	. .	. .	0.9	2.6	5.5	30 51.75	— 1.24	. .	—21.63	19 30 28.88	— 3.19
	48	Anonymous . .	P.	. .	. .	8.7	11.3	13.6	15.8	20.3	22.2	24.8	31 11.21	— 1.24	. .	—21.63	19 30 48.34	— 3.19
	49	γ Aquilæ	P.	31.4	33.9	35.5	41.7	43.7	45.8	52.0	53.5	56.3	40 43.76	— 0.66	—21.63	—21.66	19 40 21.44	0.00

3, 9, 13. Wire A used.
4, 5, 48. Wire B used.
10. Bisections at wires II–VI.
11, 37. Bisections at sets B and D.
18. Bisections at set C.
47. Telescope micrometer revolutions uncertain.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	77 6	10 5.0	0.4	9.7	7.3	34	. .	675	. .	700	. .	30.5	77 9 47.8	. .	+ 4 5.6	128 20 14.6	+ 7.6
2	69 18	7.1	3.0	14.6	9.6	32	815	850	. .	. .	. .	30.5	69 22 12.9	. .	+ 2 30.8	120 31 4.9	+ 9.8
3	56 18	6.5	3.3	14.3	10.2	34	. .	. .	. .	228	250	30.5	56 24 25.0	. .	+ 1 25.9	107 32 12.1	+12.2
4	55 30	6.5	2.0	13.4	8.2	32	. .	760	. .	. .	. .	30.5	55 31 42.3	. .	+ 1 23.2	106 39 26.7	+12.2
5	55 30	6.5	2.0	13.4	8.2	46	. .	. .	. .	. .	395	30.5	55 28 14.3	62.5	+ 1 23.0	106 35 58.5	+13.3
6	68 54	3.5	28.7	10.8	6.1	30	680	715	. .	. .	. .	30.5	68 58 49.4	. .	+ 2 28.0	120 7 38.6	+15.5
7	74 12	7.6	3.3	12.7	10.5	35	515	540	. .	. .	. .	30.5	74 17 31.6	. .	+ 3 20.8	125 27 13.6	+15.3
8	78 18	6.0	2.0	11.3	7.1	30	135	075	. .	. .	. .	30.5	78 22 56.5	. .	+ 4 31.4	129 33 49.1	+15.2
9	20 0	5.6	3.2	15.0	9.5	34	. .	340	. .	285	. .	30.5	20 6 24.1	. .	+ 20.9	71 13 6.2	− 1.4
10	46 22	4.3	29.8	11.5	7.1	34	530	740	915	195	380	30.5	46 25 43.9	. .	+ 1 0.2	97 33 5.3	. .
11	321 54	2.7	1.2	10.0	7.5	33	600	. .	560	. .	570	30.5	321 58 5.6	. .	− 44.9	13 3 41.9	+ 0.2
12	44 12	5.1	1.0	12.3	8.0	37	. .	. .	. .	605	. .	30.5	44 15 2.6	. .	+ 55.9	95 22 19.7	+20.5
13	40 10	7.1	3.0	14.1	9.2	35	. .	965	. .	105	. .	30.5	40 15 57.6	. .	+ 48.6	91 23 7.4	− 6.5
14	8 38	5.4	4.0	15.5	10.1	31	382	330	. .	. .	. .	30.5	8 42 35.9	. .	+ 8.8	59 49 5.9	+18.6
15	77 52	6.5	2.0	12.3	8.6	26	778	805	. .	. .	. .	30.5	77 57 46.5	. .	+ 4 22.8	129 8 30.5	+24.4
16	77 52	3.5	0.4	10.5	8.6	35	790	715	. .	. .	. .	30.5	77 55 29.3	. .	+ 4 22.1	129 6 12.6	+24.5
17	302 56	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	.	. . . .	. .	. .	. . . .	. .
18	302 56	3.5	0.4	10.5	7.8	31	780	. .	778	. .	760	30.5	303 0 32.7	60.0	− 1 28.3	354 5 25.6	+ 2.0
19	33 48	4.0	0.9	12.6	8.1	28	005	992	. .	. .	. .	30.5	33 53 29.4	. .	+ 38.6	85 0 29.2	+22.5
20	3 52	6.7	5.2	16.3	9.0	34	235	300	. .	. .	. .	30.5	3 55 50.8	. .	+ 4.0	55 2 15.0	+17.4
21	310 12	8.4	6.0	15.3	13.5	33	155	170	165	160	175	30.5	310 16 6.4	. .	− 1 7.8	1 21 19.8	+ 0.8
22	47 38	2.8	28.8	11.0	5.5	34	245	225	. .	318	340	30.5	47 41 55.2	. .	+ 1 3.1	98 49 19.5	+ 1.3
23	18 38	5.9	4.0	15.8	9.8	36	675	705	. .	740	720	30.5	18 41 14.0	. .	+ 19.5	69 47 54.7	+ 1.5
24	27 8	2.3	1.8	12.5	7.5	35	660	685	. .	. .	. .	30.5	27 11 32.4	. .	+ 29.6	78 18 23.2	+21.7
25	15 58	5.0	2.6	15.2	8.6	38	315	300	. .	290	340	30.5	16 0 50.6	. .	+ 16.5	67 7 28.3	+ 1.2
26	28 6	6.5	3.1	15.0	9.7	31	190	210	. .	235	220	30.5	28 10 38.4	59.2	+ 30.8	79 17 30.4	. .
27	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
28	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
29	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
30	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
31	58 16	9 29.1	24.5	9.0	3.6	34	910	930	. .	. .	. .	30.4	58 19 47.9	. .	+ 1 32.2	109 27 41.3	− 7.9
32	59 54	27.0	24.3	8.0	3.6	36	. .	060	. .	140	. .	30.4	59 57 31.1	. .	+ 1 38.3	111 5 30.6	− 8.4
33	67 30	10 1.0	27.1	10.3	6.2	37	. .	. .	. .	570	595	30.4	67 33 5.6	. .	+ 2 17.2	118 41 44.0	−10.9
34	2 50	2.3	29.8	13.1	6.9	38	. .	240	. .	262	. .	30.4	2 52 53.7	. .	+ 2.9	53 59 17.8	+ 8.9
35	21 4	1.0	28.9	11.9	6.0	36	. .	. .	. .	720	740	30.4	21 7 18.3	. .	+ 22.1	72 14 1.6	+ 4.9
36	47 8	9 26.0	21.8	6.1	0.7	32	570	590	. .	610	630	30.4	47 12 26.8	. .	+ 1 1.7	98 19 49.7	+ 1.7
37	346 34	10 4.2	1.1	12.5	8.7	32	. .	. .	. .	. .	290	30.4	346 38 23.9	. .	− 13.6	37 44 31.5	+11.9
38	69 26	9 29.6	24.0	7.5	3.4	35	. .	. .	. .	470	. .	30.4	69 29 40.5	. .	+ 2 31.6	120 38 33.3	− 9.9
39	63 54	10 1.0	29.2	9.2	5.7	34	. .	. .	. .	228	230	30.4	63 57 56.9	. .	+ 1 56.5	115 6 14.6	− 7.9
40	20 46	1.3	28.1	12.2	5.2	31	710	735	. .	. .	. .	30.4	20 50 34.6	. .	+ 21.8	71 57 17.6	+ 6.4
41	6 10	1.4	29.2	12.0	6.3	37	. .	. .	. .	145	155	30.4	6 13 11.8	. .	+ 6.2	57 19 39.2	+ 9.9
42	25 8	1.8	29.1	11.8	6.5	32	480	490	. .	525	515	30.4	25 12 22.4	. .	+ 27.0	76 19 10.6	+ 2.9
43	70 50	0.6	26.6	9.0	5.2	34	905	920	. .	. .	. .	30.4	70 53 46.6	. .	+ 2 44.0	122 2 51.8	− 7.4
44	79 36	0.0	27.0	7.7	4.3	35	525	555	. .	. .	. .	30.4	79 39 37.5	. .	+ 5 4.0	130 51 2.7	−10.0
45	35 56	9 28.3	23.3	7.9	2.6	30	810	830	. .	832	870	30.4	36 0 52.0	. .	+ 41.7	87 7 54.9	+ 2.4
46	65 26	10 0.2	25.6	9.0	4.9	27	. .	085	. .	. .	. .	30.4	65 31 47.1	. .	+ 2 5.4	116 40 13.7	− 4.2
47	65 30	2.5	27.8	10.7	7.2	33	. .	385	. .	. .	. .	30.4	65 34 8.5	. .	+ 2 5.7	116 42 35.4	− 4.1
48	65 30	2.5	27.8	10.7	7.2	38	. .	. .	. .	790	795	30.4	65 30 13.5	. .	+ 2 5.3	116 38 40.0	− 4.0
49	28 30	0.2	27.4	10.3	5.7	32	435	420	. .	. .	. .	30.4	28 34 24.5	. .	+ 31.3	79 41 17.0	+ 2.0

No.	Barom.	At. Ther
	in.	°
5	30.23	64.2
18	30.20	61.0
26	30.20	61.3

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
10	−42 10.9	− 15 57.6	. .	− 58 8.5
26	− 0.1	. . .	. .	− 0.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Sept. 20	1	λ Ursæ Minoris. .	P.	. .	. .	. .	38.0	27.5	18.0	. .	. .	. .	48 27.97	+48.69	. .	−21.66	19 48 55.00	+ 0.04
	2	B. A. C. 6877 . .	P.	35.8	38.8	40.6	47.8	50.2	52.8	0.0	1.8	4.8	56 50.29	− 1.35	. .	−21.66	19 56 27.28	− 3.53
	3	B. A. C. 6886 . .	P.	. .	55.0	57.6	0.1	2.4	5.0	9.9	11.7	14.6	58 0.08	− 1.37	. .	−21.66	19 57 37.05	− 3.57
	4	B. A. C. 6934 . .	P.	4.4	6.9	8.4	14.4	16.5	18.6	24.7	26.2	28.8	5 16.54	− 0.83	. .	−21.67	20 4 54.04	− 2.78
	5	a^2 Capricorni. . .	P.	20.2	22.8	24.4	30.7	32.8	34.9	41.2	42.7	45.3	11 32.78	− 1.01	−21.65	−21.68	20 11 10.09	+ 0.01
	6	κ Cephei	P.	. .	. .	. .	. .	. .	. .	. .	7.0	18.4	13 22.60	+ 3.24	. .	−21.68	20 13 4.16	+ 0.02
	7	B. A. C. 7025 . .	P.	58.4	1.5	3.4	11.1	13.7	16.4	24.2	26.0	29.3	19 13.78	− 1.46	. .	−21.68	20 18 50.64	− 3.87
	8	Groombridge 3241	P.	13.3	21.6	26.4	46.4	53.2	59.8	19.5	24.6	33.0	30 53.09	+ 1.98	. .	−21.70	20 30 33.37	+ 0.20
	9	B. A. C. 7155 . .	P.	52.8	56.0	58.0	6.0	8.8	11.4	19.4	21.4	24.7	35 8.72	− 1.52	. .	−21.69	20 34 45.51	− 4.05
	10	B. A. C. 7204 . .	P.	18.8	21.8	23.9	31.0	33.6	35.9	43.3	45.0	48.3	41 33.51	− 0.23	. .	−21.70	20 40 11.58	− 2.35
	11	B. A. C. 7212 . .	P.	10.1	13.4	15.2	23.2	25.8	28.3	36.2	38.2	41.5	43 25.77	− 1.48	. .	−21.70	20 43 2.59	− 4.02
	12	B. A. C. 7234 . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	15.1	45 59.05	− 1.52	. .	−21.70	20 45 35.83	− 4.12
	13	12 Year Cat. 1879.	P.	18.8	33.5	42.4	18.3	29.8	42.0	17.0	26.0	40.6	53 29.82	+ 4.41	. .	−21.72	20 53 12.51	− 0.09
	14	σ^2 Ursæ Majoris, S.P.	P.	14.9	10.9	0.1	54.7	49.0	43.7	38.2	27.6	23.7	59 49.20	− 3.13	. .	−21.72	8 59 24.35	+ 0.03
	15	Mur. Zones 187, 66	P.	4.8	7.4	9.1	15.6	17.8	19.9	26.6	28.0	30.8	7 17.78	− 1.13	. .	−21.71	21 6 54.94	− 3.47
	16	O. Arg. S. 21237 .	P.	4.4	7.0	8.8	15.2	17.3	19.5	26.2	27.9	30.6	8 17.43	− 1.13	. .	−21.71	21 7 54.59	− 3.48
	17	1 Pegasi	P.	30.2	33.0	34.6	41.0	43.2	45.5	52.0	53.6	56.3	16 43.27	− 0.51	−21.68	−21.74	21 16 21.02	− 0.11
	18	1 Draconis, S. P. .	P.	4.0	46.5	35.3	6.3	51.3	37.3	. .	. .	. .	19 37.27	− 7.37	. .	−21.74	9 19 8.16	− 0.31
	19	β Aquarii. . . .	P.	12.1	14.8	16.3	22.5	24.4	26.4	32.7	34.3	36.8	25 24.48	− 0.91	−21.70	−21.75	21 25 1.82	− 0.02
	20	Saturn I, N. . .	P.	51.8	54.3	56.0	. .	. .	. .	13.0	14.7	17.3	33 4.52	− 1.06	. .	−21.74	21 32 41.72	. .
	21	Saturn II, S. . .	P.	. .	. .	1.5	3.6	5.7	7.8	9.9	. .	. .	33 5.70	− 1.06	. .	−21.74	21 32 42.92	. .
	22	Mur. Zones 207, 70	P.	49.8	52.6	54.0	0.5	2.5	4.7	11.0	12.7	15.3	11 2.57	− 1.07	. .	−21.78	22 10 39.72	− 3.53
	23	B. A. C. 7826 . .	P.	30.9	34.3	36.3	44.2	46.8	49.4	57.5	59.5	2.8	21 46.86	− 1.51	. .	−21.78	22 21 23.57	− 4.36
	24	B. A. C. 7842 . .	P.	36.0	39.2	41.0	48.4	50.9	53.3	0.7	2.5	5.4	24 50.82	− 1.36	. .	−21.79	22 24 27.67	− 4.06
	25	B. A. C. 7872 . .	P.	45.6	48.6	50.5	57.7	0.1	2.6	10.0	11.7	14.8	30 0.18	− 1.35	. .	−21.79	22 29 37.04	− 4.04
	26	B. A. C. 7895 . .	P.	36.5	39.3	41.0	48.3	50.6	53.1	0.3	2.0	5.0	33 50.68	− 1.33	. .	−21.79	22 33 27.56	− 4.00
	27	B. A. C. 7923 . .	P.	19.7	22.5	24.3	31.4	33.8	36.0	43.0	44.8	47.8	37 33.70	− 0.32	. .	−21.80	22 37 11.58	− 2.90
	28	B. A. C. 7966 . .	P.	47.0	50.0	51.8	59.1	1.7	4.0	11.5	13.2	16.2	46 1.61	− 1.37	. .	−21.81	22 45 38.43	− 4.09
	29	B. A. C. 7980 . .	P.	14.6	17.3	18.9	25.3	27.3	29.6	35.9	37.5	40.0	48 27.38	− 1.07	. .	−21.81	22 48 4.50	− 3.57
	30	B. A. C. 8032 . .	P.	54.4	57.3	59.0	5.9	8.0	10.4	17.3	19.0	21.9	58 8.13	− 0.36	. .	−21.82	22 57 45.95	− 2.98
	31	Niobe	P.	39.8	42.3	44.1	50.6	52.7	54.4	1.4	2.9	5.7	4 52.66	− 0.52	. .	−21.82	23 4 30.32	. .
	32	B. A. C. 8113 . .	P.	16.8	19.9	21.8	29.0	31.4	34.0	41.3	43.0	46.1	12 31.48	− 1.36	. .	−21.83	23 12 8.29	− 4.06
	33	B. A. C. 8172 . .	P.	30.3	33.2	35.1	42.7	45.3	47.8	55.5	57.3	0.4	21 45.29	− 1.43	. .	−21.84	23 21 22.02	− 4.17
	34	B. A. C. 8201 . .	P.	27.6	30.9	32.8	40.5	43.2	45.8	53.9	55.8	59.0	26 43.28	− 1.48	. .	−21.85	23 26 19.95	− 4.25
	35	ι Piscium . . .	P.	44.9	47.4	49.0	55.2	57.2	59.2	5.4	6.9	9.4	33 57.18	− 0.74	−21.85	−21.88	23 33 34.56	− 0.03
	36	Anonymous . .	P.	38.4	40.8	42.3	48.7	50.7	52.7	59.0	0.4	3.0	41 50.67	− 0.90	. .	−21.86	23 41 27.91	− 3.38
	37	Eurydice . . .	P.	28.0	30.6	32.0	38.2	40.2	42.3	48.3	49.9	52.4	51 40.21	− 0.84	. .	−21.87	23 51 17.60	. .
	38	Metis	P.	49.1	51.5	53.3	59.4	1.5	3.5	9.7	11.5	13.9	4 1.49	− 0.96	. .	−21.88	0 3 38.65	. .
	39	α Leonis	F.	54.6	57.4	58.9	5.1	7.2	9.2	15.5	17.1	19.8	2 7.20	− 0.63	−22.62	−22.66	10 1 43.91	− 0.08
	40	γ^1 Leonis	F.	16.0	18.7	20.5	26.9	29.0	31.3	37.8	39.3	42.3	13 29.09	− 0.48	−22.70	−22.67	10 13 5.94	+ 0.01
	41	ρ Leonis	F.	25.7	28.3	29.9	36.0	38.1	40.1	46.3	47.9	50.6	26 38.10	− 0.68	−22.69	−22.69	10 26 14.73	− 0.07
	42	α Ursæ Majoris . .	F.	56.3	1.9	5.2	18.5	22.9	27.3	40.7	43.9	49.5	56 22.91	+ 1.03	. .	−22.72	10 56 1.22	+ 0.30
	43	δ Leonis	F.	38.7	41.6	43.1	49.6	51.9	54.0	0.7	2.3	5.0	7 51.88	− 0.47	−22.83	−22.73	11 7 28.68	+ 0.04
21	44	Sun I, S. . . .	F.	48.0	50.5	52.0	58.3	0.3	2.3	8.5	10.0	12.6	53 0.28	− 0.83	. .	−22.77	11 52 36.68	. .
	45	Sun II, N. . . .	F.	56.0	58.6	0.2	6.5	8.5	10.6	16.6	18.1	20.8	55 8.43	− 0.83	. .	−22.77	11 54 44.83	. .
	46	η Ursæ Majoris. .	F.	41.0	45.0	47.1	56.8	0.0	3.3	12.7	14.9	19.0	42 59.98	+ 0.31	. .	−22.91	13 42 37.38	− 0.03
	47	η Bootis	F.	55.3	58.0	59.8	6.3	8.4	10.6	17.0	18.7	21.5	49 8.40	− 0.51	−22.96	−22.92	13 48 44.97	− 0.01
	48	XVIII, 3 . . .	F.	5.5	8.0	9.9	16.2	18.6	20.5	27.0	28.6	31.5	5 18.42	− 1.22	. .	−23.17	18 4 54.03	− 2.45
	49	B. A. C. 6218 . .	F.	. .	. .	. .	. .	. .	38.9	44.4	46.4	49.9	13 33.59	− 0.12	. .	−23.18	18 13 10.29	− 1.40

2, 8, 13, 14, 18. Bisections at sets B and D.
6. Bisections at wires V and VI.
22. Wire B used.
31, 37, 38. Wire A used.
40. Telescope micrometer reading decreased two revolutions in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	′	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	309 54	9 29.3	28.0	9.4	5.6	31	. .	302	275	260	. .	30.4	309 58 42.8	56.5	− 1 8.5	1 3 55.5	+ 0.5
2	71 12	10 0.2	26.0	8.6	4.5	37	. .	. .	170	. .	195	30.4	71 15 13.0	. .	+ 2 47.7	122 24 21.9	− 3.5
3	72 8	2.5	28.3	10.3	7.1	34	. .	. .	. .	515	522	30.4	72 11 51.6	. .	+ 2 57.1	123 21 9.9	− 3.7
4	40 0	0.3	26.5	9.7	4.8	33	350	345	. .	370	400	30.4	40 4 11.1	. .	+ 48.4	91 11 20.6	+ 6.6
5	51 44	9 29.2	25.5	9.2	4.5	33	220	240	. .	265	. .	30.4	51 48 13.3	. .	+ 1 13.0	102 55 47.5	+ 1.6
6	321 30	10 1.0	28.6	10.5	7.6	33	. .	. .	. .	570	595	30.4	321 34 7.2	. .	− 45.6	12 39 42.8	0.0
7	76 34	1.0	27.0	8.6	6.2	33	840	830	. .	. .	. .	30.4	76 38 2.7	56.1	+ 3 57.1	127 48 21.0	− 3.0
8	326 44	9 27.6	25.5	7.1	3.4	36	040	. .	050	. .	072	30.4	326 47 31.9	56.1	− 37.6	17 53 15.5	+ 1.5
9	78 46	10 1.0	26.4	8.0	4.6	37	225	245	. .	. .	. .	30.4	78 49 11.3	. .	+ 4 43.3	130 0 15.8	− 1.9
10	5 20	9 29.6	29.0	10.6	5.7	37	470	460	. .	. .	. .	30.4	5 23 7.3	. .	+ 5.4	56 29 33.9	+15.7
11	77 8	10 1.1	27.0	7.9	5.2	33	. .	505	. .	675	. .	30.4	77 12 7.3	. .	+ 4 7.9	128 22 56.4	− 0.6
12	79 2	2.0	27.1	8.1	5.5	36	. .	. .	. .	460	455	30.4	79 5 23.2	. .	+ 4 50.0	130 16 34.4	− 0.8
13	318 46	9 28.4	26.1	8.4	5.7	36	940	. .	942	. .	950	30.4	318 49 17.2	. .	− 50.4	9 54 48.0	0.0
14	286 32	10 1.0	27.6	9.6	6.7	37	875	. .	865	. .	850	30.4	286 35 1.1	. .	− 3 11.3	337 38 11.0	+ 1.0
15	59 24	9 27.4	23.8	8.0	3.4	33	935	950	. .	. .	. .	30.4	59 28 3.8	. .	+ 1 37.6	110 36 2.6	+ 6.5
16	59 24	27.4	23.8	8.0	3.4	37	. .	620	. .	650	. .	30.4	59 27 7.6	. .	+ 1 37.5	110 35 6.3	+ 6.6
17	19 32	10 2.1	0.0	12.0	7.2	30	695	705	. .	. .	. .	30.4	19 36 49.1	. .	+ 20.6	70 43 30.9	+ 2.3
18	300 44	9 28.0	25.0	7.7	5.2	35	725	. .	790	. .	. .	30.4	300 47 35.3	. .	− 1 36.7	351 52 19.8	+ 0.2
19	44 56	27.8	24.1	7.0	2.1	35	415	400	. .	410	450	30.4	44 59 42.0	. .	+ 57.8	96 7 1.0	+ 1.6
20	54 52	29.3	26.7	10.5	5.0	33	505	. .	. .	. .	490	30.4	54 56 8.7	. .	+ 1 22.3	106 3 52.2	. .
21	54 52	29.3	26.7	10.5	5.0	32	. .	350	. .	360	. .	30.4	54 56 26.3	53.2	+ 1 22.3	106 4 9.8	. .
22	55 32	29.7	25.7	11.0	4.9	40	. .	965	. .	960	. .	30.4	55 31 41.7	. .	+ 1 24.4	106 39 27.3	+13.1
23	78 30	10 4.2	29.5	10.5	8.1	31	330	318	. .	. .	. .	30.4	78 34 38.7	. .	+ 4 39.7	129 45 39.6	+ 9.8
24	71 46	1.5	27.2	9.8	5.4	35	195	215	. .	. .	. .	30.4	71 49 41.5	. .	+ 2 55.1	122 58 57.8	+11.5
25	71 6	1.6	27.6	9.8	6.3	37	175	220	. .	. .	. .	30.4	71 9 10.6	. .	+ 2 48.6	122 18 20.4	+12.1
26	70 6	9 29.8	23.8	6.3	3.0	38	480	435	. .	. .	. .	30.4	70 8 54.4	. .	+ 2 39.6	121 17 55.2	+12.7
27	9 16	10 0.4	27.5	10.0	5.8	37	650	615	. .	. .	. .	30.4	9 19 5.0	. .	+ 9.5	60 25 35.7	+19.2
28	72 18	2.0	27.6	9.5	6.4	31	262	260	. .	. .	. .	30.4	72 22 41.5	. .	+ 3 1.1	123 32 3.8	+13.6
29	55 18	4.1	29.5	12.9	7.7	37	. .	370	. .	510	. .	30.4	55 21 5.3	. .	+ 1 24.0	106 28 50.5	+16.2
30	11 26	9 29.6	27.2	10.2	4.6	38	750	745	. .	. .	. .	30.4	11 28 48.4	. .	+ 11.8	62 35 21.4	+19.5
31	20 12	10 1.0	28.5	11.8	6.1	38	. .	710	. .	840	. .	30.4	20 17 19.6	. .	+ 21.5	71 24 2.3	− 1.4
32	72 0	2.8	27.2	9.8	6.2	37	270	275	. .	. .	. .	30.4	72 3 9.3	. .	+ 2 57.9	123 12 28.4	+16.2
33	75 0	3.3	28.0	9.8	6.5	35	. .	060	. .	048	. .	30.4	75 3 43.3	. .	+ 3 35.0	126 13 39.5	+16.8
34	77 16	1.8	27.7	8.5	6.5	35	325	328	. .	. .	. .	30.4	77 19 39.4	. .	+ 4 13.6	128 30 14.2	+17.0
35	33 52	9 29.8	27.0	10.4	5.7	35	135	130	. .	190	165	30.4	33 55 43.2	. .	+ 39.2	85 2 43.6	+ 0.6
36	44 26	10 1.0	26.9	10.0	4.2	34	770	795	. .	. .	. .	30.4	44 29 48.7	. .	+ 57.3	95 37 7.2	+20.6
37	40 12	1.7	29.6	9.9	5.9	39	. .	950	. .	005	. .	30.4	40 17 1.2	. .	+ 49.5	91 24 11.9	− 6.4
38	48 44	9 27.5	25.0	7.9	3.2	39	. .	300	. .	. .	. .	30.4	48 49 14.6	49.0	+ 1 6.7	99 56 42.5	− 5.2
39	26 14	28.7	24.1	9.4	4.8	32	. .	010	. .	030	. .	30.3	26 18 32.6	. .	+ 28.6	77 25 22.4	+ 1.0
40	18 20	29.1	26.5	10.8	5.0	32	086	100	. .	142	146	30.3	18 25 0.8	56.5	+ 19.2	69 31 41.2	+ 2.4
41	28 52	28.9	25.2	10.1	4.7	33	. .	. .	. .	368	380	30.3	28 56 11.7	. .	+ 31.9	80 3 4.8	+ 0.5
42	336 24	24.5	22.4	5.4	2.7	31	. .	466	. .	486	. .	30.3	336 28 45.5	. .	− 25.1	27 34 40.6	+ 1.6
43	17 36	27.3	25.5	9.4	5.8	30	. .	380	. .	390	. .	30.3	17 40 57.4	58.5	+ 18.4	68 47 37.0	+ 2.7
44	38 24	27.6	24.2	5.6	2.1	34	816	868	. .	. .	. .	30.3	38 27 51.4	. .	+ 45.6	89 34 58.2	. .
45	37 52	28.3	23.5	9.2	3.7	34	. .	. .	. .	500	520	30.3	37 55 54.8	60.2	+ 44.7	89 3 0.7	. .
46	348 54	25.7	22.2	6.0	1.7	35	. .	. .	. .	580	604	30.3	348 57 41.6	. .	− 11.2	40 3 51.6	+ 3.1
47	19 48	27.0	25.7	10.0	3.5	34	. .	. .	. .	438	444	30.3	19 51 56.2	. .	+ 20.8	70 58 38.2	+ 3.8
48	58 16	26.5	22.2	6.0	3.4	35	144	160	. .	. .	. .	29.6	58 19 45.8	. .	+ 1 33.4	109 27 40.4	− 7.9
49	357 56	29.3	27.2	9.5	4.1	33	. .	. .	. .	158	. .	29.6	358 0 14.2	. .	− 2.0	49 6 33.4	+ 9.6

No.	Barom.	At. Ther.
	in.	°
1	29.99	58.2
7	29.99	57.9
8	29.99	57.9
21	30.015	55.5
38	30.03	51.2
40	30.16	56.0
43	30.17	58.2
45	30.17	59.0

For summary of the elements of reduction see page 3.

No	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
20	− 0.8	+ 8.8	. .	+ 8.0
21	− 0.8	− 8.8	. .	− 9.6
44	− 5.5	− 15 58.7	. .	− 16 4.2
45	− 5.4	+ 15 58.7	. .	+ 15 53.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	CORRECTIONS. Inst.	Clock appar'nt.	Clock adopted.	Apparent Right Ascension.	Miscellan'us Corrections.
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Sept. 21	1	B. A. C. 6245 . .	F.	30.5	33.2	34.8	41.1	43.3	45.4	51.9	53.5	56.2	17 43.32	− 0.62	. .	−23.18	18 17 19.52	− 1.90
	2	O. Arg. S. 18436 .	F.	20.7	23.6	25.2	32.3	34.7	36.9	43.7	45.4	48.4	29 34.54	− 1.36	. .	−23.19	18 29 9.99	− 2.80
	3	α Lyræ	F.	51.7	55.0	56.9	4.6	7.2	9.9	17.8	19.7	22.9	33 7.30	− 0.17	−23.17	−23.23	18 32 43.90	− 0.04
	4	B. A. C. 6368 . .	F.	. .	. .	25.3	28.9	32.5	35.9	43.3	45.7	51.1	36 28.82	− 0.42	. .	−23.19	18 36 6.05	− 1.05
	5	XVIII, 22 . . .	F.	11.5	14.6	16.4	23.9	26.2	28.8	36.4	38.2	41.5	41 26.39	− 1.51	. .	−23.20	18 41 1.68	− 3.07
	6	β Lyræ	F.	41.6	43.4	48.4	50.8	53.3	55.6	58.2	2.9	4.7	45 53.21	− 0.31	−23.25	−23.24	18 45 29.66	+ 0.04
	7	Mars I, S. . . .	F.	. .	. .	. .	. .	. .	. .	49.3	51.0	54.0	46 40.23	− 1.34	. .	−23.21	18 46 15.68	+ 0.49
	8	Mars N. . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	9	ζ Aquilæ . . .	F.	53.4	56.0	57.6	3.9	6.0	8.0	14.3	15.9	18.5	0 5.96	− 0.69	−23.21	−23.26	18 59 42.01	+ 0.03
	10	B. A. C. 6622 . .	F.	28.9	30.9	36.3	39.0	41.7	44.4	47.0	52.6	54.6	15 41.71	− 1.65	. .	−23.24	19 15 16.82	− 3.55
	11	δ Aquilæ	F.	. .	. .	. .	38.5	40.4	42.4	46.5	48.0	50.6	19 38.34	− 0.86	−23.27	−23.28	19 19 14.20	+ 0.04
	12	B. A. C. 6680 . .	F.	44.8	47.7	49.3	56.6	59.0	1.3	8.5	10.3	13.4	24 58.89	− 1.43	. .	−23.24	19 24 34.22	− 3.27
	13	B. A. C. 6684 . .	F.	. .	. .	33.5	35.8	38.2	40.5	45.3	47.0	50.0	25 35.80	− 1.42	. .	−23.24	19 25 11.14	− 3.26
	14	Mural Zones 119, 60	F.	53.2	56.0	57.8	4.6	6.9	9.4	16.4	18.0	20.9	31 7.02	− 1.36	. .	−23.25	19 30 42.41	− 3.20
	15	O. Arg. S. 19809 .	F.	26.5	29.2	31.2	38.1	40.5	42.7	49.7	51.4	54.4	31 40.41	− 1.36	. .	−23.25	19 31 15.80	− 3.21
	16	γ Aquilæ . . .	F.	33.0	35.6	37.2	43.4	45.4	47.5	53.9	55.3	57.9	40 45.47	− 0.74	−23.27	−23.30	19 40 21.43	0.00
	17	B. A. C. 6857 . .	F.	2.8	6.2	8.1	16.0	18.8	21.4	29.4	31.5	34.8	53 18.78	− 0.14	. .	−23.28	19 52 55.36	− 1.96
	18	λ Ursæ Minoris. .	F.	. .	. .	. .	. .	. .	. .	. .	. .	27.0	48 26.69	+50.25	. .	−23.31	19 48 53.63	− 0.03
24	19	Sun I, N. . . .	P.	39.9	42.4	44.0	50.1	52.2	54.1	0.3	1.9	4.4	3 52.14	− 0.79	. .	−27.74	12 3 23.61	. .
	20	Sun II, S. . . .	P.	48.0	50.4	52.0	58.2	0.2	2.3	8.4	9.9	12.5	6 0.21	− 0.79	. .	−27.74	12 5 31.68	. .
	21	12² Canum Venat. .	P.	23.5	28.7	34.3	36.9	39.3	42.0	44.7	49.9	54.2	50 39.28	− 0.05	−27.71	−27.63	12 50 11.60	+ 0.08
	22	Polaris, S. P. . .	P.	. .	. .	39.0	14.0	47.0	19.0	54.0	. .	. .	14 46.60	−41.78	. .	−27.65	1 13 37.17	− 2.30
	23	Mercury I, C. . .	P.	29.7	32.5	34.0	40.1	42.3	44.4	50.6	52.0	54.7	27 42.26	− 0.95	. .	−27.79	13 27 13.52	+ 0.19
	24	η Bootis	P.	0.3	2.9	4.5	11.0	13.1	15.3	21.9	23.4	26.2	49 13.18	− 0.48	−27.79	−27.70	13 48 45.00	+ 0.04
	25	α Bootis	P.	13.7	16.5	18.2	24.7	26.9	29.1	35.6	37.3	39.8	10 26.87	− 0.46	−27.90	−27.73	14 9 58.68	+ 0.17
	26	γ² Sagittarii . . .	P.	4.6	7.5	9.3	16.3	18.8	21.0	28.0	29.9	32.9	58 18.70	− 1.34	−28.07	−28.02	17 57 49.34	+ 0.06
	27	XVIII, 5 . . .	P.	35.8	38.6	40.3	46.7	48.8	51.0	57.7	59.4	2.2	6 48.94	− 1.16	. .	−27.97	18 6 19.81	− 2.44
	28	XVIII, 9 . . .	P.	. .	. .	48.4	50.7	52.9	55.2	59.6	1.3	4.0	12 50.71	− 1.20	. .	−27.98	18 12 21.53	− 2.52
	29	B. A. C. 6246 . .	P.	9.7	13.6	16.0	26.0	29.3	32.6	42.4	44.8	48.9	17 29.26	+ 0.28	. .	−27.98	18 17 1.56	− 0.99
	30	1 Aquilæ . . .	P.	43.2	45.8	47.4	53.6	55.6	57.9	3.9	5.4	8.0	28 55.64	− 0.96	−28.04	−28.05	18 28 26.63	+ 0.06
	31	α Lyræ	P.	56.3	59.5	1.6	9.4	11.9	14.6	22.5	24.4	27.6	33 11.98	− 0.12	−27.98	−28.06	18 32 43.80	− 0.06
	32	XVIII, 17 . . .	P.	14.0	17.0	18.6	25.4	27.6	30.0	36.6	38.4	41.1	34 27.63	− 1.24	. .	−28.00	18 33 58.39	− 2.71
	33	XVIII, 18 . . .	P.	51.1	54.0	55.8	3.0	5.4	7.8	15.0	17.0	19.8	37 5.43	− 1.36	. .	−28.01	18 36 36.06	− 2.88
	34	XVIII, 19 . . .	P.	57.2	59.9	1.5	7.9	10.2	12.5	18.9	20.4	23.3	39 10.20	− 1.14	. .	−28.01	18 38 41.05	− 2.63
	35	XVIII, 22 . . .	P.	16.3	19.4	21.3	28.7	31.0	33.7	41.0	42.8	46.0	41 31.13	− 1.43	. .	−28.01	18 41 1.69	− 3.01
	36	B. A. C. 6404 . .	P.	29.2	32.0	37.5	40.0	43.0	45.6	48.3	53.8	55.7	42 42.89	− 0.05	. .	−28.01	18 42 14.83	− 1.45
	37	β Lyræ	P.	43.3	46.3	48.2	55.4	57.8	0.3	7.5	9.4	12.5	45 57.86	− 0.25	−28.02	−28.07	18 45 29.54	− 0.02
	38	ζ Aquilæ	P.	58.0	0.8	2.4	8.5	10.6	12.7	19.0	20.7	23.2	0 10.66	− 0.61	−28.05	−28.09	18 59 41.96	+ 0.04
	39	B. A. C. 6693 . .	P.	24.2	27.2	28.9	36.0	38.5	40.9	48.0	49.8	53.0	27 38.50	− 1.37	. .	−28.07	19 27 9.06	− 3.26
	40	B. A. C. 6753 . .	P.	47.7	50.6	52.5	59.6	2.0	4.4	1.6	3.4	6.3	38 2.01	− 1.35	. .	−28.08	19 37 32.58	− 3.31
	41	γ Aquilæ	P.	37.8	39.4	41.9	48.2	50.2	52.3	58.5	0.0	2.8	40 50.23	− 0.68	−28.13	−28.15	19 40 21.40	+ 0.01
	42	λ Ursæ Minoris. .	P.	. .	. .	. .	. .	27.5	. .	. .	. .	28.0	48 27.60	+48.64	. .	−28.16	19 48 48.08	− 1.48
	43	XIX, 15 . . .	P.	35.4	38.4	40.0	47.0	49.2	51.5	58.4	0.1	3.0	49 49.22	− 1.28	. .	−28.10	19 49 19.84	− 3.26
	44	XIX, 16 . . .	P.	. .	. .	. .	. .	. .	. .	46.8	48.5	51.6	51 37.27	− 1.34	. .	−28.10	19 50 7.83	− 3.37
	45	B. A. C. 6860 . .	P.	. .	25.3	27.8	30.5	33.1	35.8	41.0	43.0	46.0	53 30.52	− 0.14	. .	−28.10	19 53 2.28	− 1.93
	46	α² Capricorni. . .	P.	26.8	29.4	31.1	37.2	39.3	41.5	47.8	49.2	51.9	11 39.36	− 1.03	−28.25	−28.18	20 11 10.15	+ 0.11
	47	κ Cephei	P.	. .	. .	9.6	19.4	28.4	38.0	47.4	. .	. .	13 28.56	+ 3.25	. .	−28.19	20 13 3.62	− 0.15
	48	B. A. C. 7036 . .	P.	3.4	6.6	8.5	16.1	18.5	21.3	28.8	30.7	33.7	21 18.62	− 1.45	. .	−28.13	20 20 49.04	− 3.74
	49	ε Delphini . . .	P.	33.5	36.2	37.6	43.9	46.0	48.0	54.2	55.7	58.5	27 45.96	− 0.67	−28.21	−28.19	20 27 17.10	+ 0.07

27. Wire B used.
37. Telescope micrometer reading increased two revolutions in reduction.
47. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° '	r. "	"	"	"							"	° ' "	°	' "	° ' "	"
1	21 4	10 1.2	0.0	12.6	6.4	36	. .	612	. .	622	. .	29.6	21 7 18.3	. .	+ 22.4	72 14 1.9	+ 4.9
2	66 38	9 26.5	22.2	5.0	1.0	36	820	814	. .	. .	. .	29.6	66 41 20.8	55.0	+ 2 13.7	117 49 55.7	− 9.2
3	0 10	28.7	26.1	7.7	4.0	36	556	566	. .	. .	. .	29.6	0 13 22.5	. .	+ 0.2	51 19 43.9	+ 1.1
4	343 42	10 0.2	27.4	9.4	5.5	34	. .	. .	. .	404	418	29.6	343 45 55.0	. .	− 16.9	34 51 59.3	+12.4
5	73 40	0.0	26.0	7.0	3.6	36	. .	274	. .	284	. .	29.6	73 43 26.5	. .	+ 3 16.2	124 53 3.9	−10.9
6	5 36	9 28.7	26.2	8.7	2.8	33	076	110	. .	. .	. .	29.6	5 40 14.0	. .	+ 5.8	56 46 41.0	− 1.2
7	65 8	25.1	20.0	3.7	0.1	31	. .	. .	. .	388	. .	29.6	65 12 46.3	. .	+ 2 5.1	116 21 12.6	. .
8	65 8	25.1	20.0	3.7	0.1	32	. .	. .	. .	. .	528	29.6	65 12 28.7	. .	+ 2 5.0	116 20 54.9	. .
9	25 8	29.1	26.1	9.2	4.1	32	. .	694	. .	704	. .	29.6	25 12 21.2	. .	+ 27.4	76 19 9.8	+ 2.2
10	79 36	28.1	24.5	5.2	1.8	35	. .	. .	. .	806	816	29.6	79 39 35.6	. .	+ 5 8.9	130 51 5.7	−10.1
11	35 56	26.4	21.8	6.2	0.4	30	. .	. .	. .	980	000	29.6	36 0 51.0	. .	+ 42.4	87 7 54.6	+ 2.1
12	69 54	10 0.5	25.7	9.4	4.0	30	404	398	. .	. .	. .	29.6	69 58 55.3	. .	+ 2 38.8	121 7 55.3	− 6.1
13	69 24	2.6	27.8	11.0	6.6	31	. .	. .	. .	156	160	29.6	69 28 42.3	. .	+ 2 34.5	120 37 38.0	− 5.8
14	66 26	9 28.5	24.0	6.7	2.2	35	. .	106	. .	110	. .	29.6	66 29 45.8	. .	+ 2 13.5	117 38 20.5	− 4.4
15	66 26	28.5	24.0	6.7	2.2	31	. .	. .	. .	870	880	29.6	66 30 35.5	. .	+ 2 13.6	117 39 10.3	− 4.3
16	28 30	10 0.8	28.1	10.5	6.0	32	. .	430	. .	436	. .	29.6	28 34 23.5	. .	+ 31.8	79 41 16.5	+ 1.5
17	358 48	1.6	28.7	11.3	5.2	36	. .	050	. .	050	. .	29.6	358 51 28.0	. .	− 1.2	49 57 48.0	+14.6
18	309 54	0.3	28.5	9.6	6.1	31	. .	. .	. .	. .	356	29.6	309 58 44.6	51.2	− 1 9.6	1 3 56.2	+ 1.4
19	39 2	9 27.0	22.0	7.6	1.9	34	050	110	. .	. .	. .	28.9	39 6 1.9	. .	+ 46.7	90 13 9.8	. .
20	39 34	26.1	20.1	5.6	0.8	34	. .	. .	. .	481	479	28.9	39 37 56.9	63.0	+ 47.6	90 45 5.7	. .
21	359 50	23.3	21.8	6.4	0.7	33	. .	. .	. .	780	805	28.9	359 54 8.5	. .	− 0.1	51 0 29.6	+ 1.2
22	307 30	26.0	24.4	6.5	4.1	35	620	605	610	610	600	28.9	307 33 37.5	65.5	− 1 14.2	358 38 44.5	0.0
23	49 40	26.6	24.2	6.8	2.9	35	435	450	. .	. .	. .	28.9	49 43 40.0	. .	+ 1 7.3	100 51 8.5	. .
24	19 48	27.4	25.7	9.9	3.8	34	350	380	. .	385	430	28.9	19 51 55.2	. .	+ 20.6	70 58 37.0	+ 2.2
25	19 0	28.6	26.9	10.6	4.5	36	280	270	. .	310	350	28.9	19 3 24.9	. .	+ 19.7	70 10 5.8	+ 2.8
26	69 12	10 1.5	27.0	8.5	5.3	31	085	110	. .	200	212	30.1	69 16 44.0	. .	+ 2 31.6	120 25 36.8	+ 0.7
27	59 56	2.4	28.5	11.1	6.8	33	695	710	. .	. .	. .	30.1	59 57 30.1	. .	+ 1 39.7	111 5 31.0	− 8.4
28	62 10	9 28.1	23.9	6.2	1.5	35	. .	. .	. .	030	. .	30.1	62 13 48.7	. .	+ 1 49.5	113 21 59.4	− 8.8
29	347 32	29.3	25.5	7.7	3.6	33	. .	. .	. .	890	895	30.1	347 36 4.9	. .	− 12.7	38 42 13.4	+11.2
30	47 8	27.6	24.4	7.4	1.8	32	460	480	. .	475	505	30.1	47 12 26.7	. .	+ 1 2.5	98 19 50.4	+ 2.4
31	0 10	29.3	27.2	9.6	5.2	36	585	550	. .	. .	. .	30.1	0 13 21.7	. .	+ 0.2	51 19 43.1	+ 0.5
32	63 54	10 2.2	22.6	9.7	6.1	34	. .	260	. .	250	. .	30.1	63 57 57.1	. .	+ 1 58.1	115 6 16.4	− 8.0
33	70 18	2.5	28.0	10.5	6.0	31	890	875	. .	. .	. .	30.1	70 22 31.3	. .	+ 2 41.2	121 31 33.7	−10.1
34	58 32	4.1	0.7	13.1	8.6	32	870	920	. .	. .	. .	30.1	58 36 13.6	. .	+ 1 34.7	109 44 9.5	− 5.8
35	73 40	1.0	25.6	7.4	3.8	36	190	060	. .	. .	. .	30.1	73 43 28.6	. .	+ 3 16.0	124 53 5.8	−10.9
36	357 32	9 26.2	25.0	7.1	2.0	38	. .	140	. .	. .	. .	30.1	357 35 0.3	. .	− 2.4	48 41 19.1	+11.4
37	5 36	28.4	25.7	7.7	2.6	31	160	140	. .	. .	. .	30.1	5 40 15.7	. .	+ 5.8	56 46 42.7	+ 0.6
38	25 8	28.1	24.6	8.9	3.6	32	780	790	. .	815	795	30.1	25 12 21.1	56.4	+ 27.3	76 19 9.6	+ 2.1
39	70 40	29.5	24.5	6.6	3.7	35	. .	690	. .	725	. .	30.1	70 43 36.4	. .	+ 2 44.7	121 52 42.3	− 6.2
40	70 0	10 0.5	26.3	7.9	5.7	37	475	510	. .	. .	. .	30.1	70 3 7.1	. .	+ 2 40.0	121 12 8.3	− 5.1
41	28 30	9 28.8	26.0	8.4	4.2	32	. .	. .	. .	670	675	30.1	28 34 22.7	. .	+ 31.7	79 41 15.6	+ 0.8
42	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
43	66 18	10 2.2	27.6	10.0	6.1	36	. .	200	. .	. .	. .	30.1	66 21 25.7	. .	+ 2 12.2	117 29 59.1	− 2.9
44	69 40	5.0	0.6	12.1	8.4	36	. .	. .	. .	285	. .	30.1	69 43 22.3	. .	+ 2 36.3	120 52 19.8	− 3.9
45	0 42	9 25.5	23.3	6.0	0.6	34	. .	. .	. .	205	225	30.1	0 46 2.4	. .	+ 0.8	51 52 24.4	+14.8
46	51 44	25.4	23.2	5.9	1.1	33	605	650	. .	. .	. .	30.1	51 48 10.8	. .	+ 1 14.0	102 55 46.0	− 0.1
47	321 30	28.3	25.6	8.0	4.9	33	. .	. .	710	. .	725	30.1	321 34 6.6	. .	− 46.2	12 39 41.6	− 0.4
48	74 46	28.6	24.5	5.3	3.0	32	040	060	. .	. .	. .	30.1	74 50 32.6	. .	+ 3 31.9	126 0 25.7	− 2.6
49	27 56	27.9	25.5	7.6	3.2	33	505	515	. .	. .	. .	30.1	28 0 10.0	. .	+ 31.0	79 7 2.2	+ 1.1

No.	Barom.	At. Ther.
	in.	°
2	30.16	57.0
18	30.17	52.5
20	30.39	62.0
22	30.36	63.8
38	30.29	58.1

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
7	− 10.5	− 8.8	. .	− 19.3
8	− 10.4	+ 8.9	. .	− 1.5
19	− 5.5	+ 15 57.9	. .	+ 15 52.4
20	− 5.6	− 15 57.9	. .	− 16 3.5
23	− 5.7	. . .	0.0	− 5.7

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s	s.	h. m. s.	s.
1875 Sept. 24	1	Groombridge 3241	P.	19.1	27.8	32.7	52.6	59.0	5.9	25.9	30.9	38.7	30 59.18	+ 1.98	. .	−28.20	20 30 32.98	+ 0.06
	2	α Cygni	P.	23.3	26.8	29.0	37.5	40.6	43.4	52.0	54.1	57.9	37 40.51	+ 0.06	−28.26	−28.21	20 37 12.36	+ 0.07
	3	B. A. C. 7204 . .	P.	25.3	28.4	30.1	37.6	40.0	42.5	49.6	51.5	54.6	41 39.96	− 0.25	. .	−28.16	20 41 11.55	− 2.29
	4	B. A. C. 7226 . .	P.	. .	. .	. .	46.0	48.5	50.9	55.8	57.6	0.7	44 46.00	− 1.38	. .	−28.16	20 44 16.46	− 3.77
	5	ν Cygni	P.	45.2	48.6	50.6	58.7	1.5	4.1	12.1	14.2	17.4	53 1.38	− 0.07	−28.24	−28.23	20 52 33.08	+ 0.07
	6	σ² Ursæ Majoris, S. P.	P.	28.3	21.3	17.5	1.5	56.2	50.5	34.6	30.5	23.7	59 56.01	− 3.14	. .	−28.24	8 59 24.63	+ 0.08
	7	ζ Cygni	P.	54.0	56.9	58.5	5.5	8.0	10.3	17.4	19.1	22.0	8 7.97	− 0.33	−28.17	−28.25	21 7 39.39	− 0.07
	8	α Cephei	P.	38.9	44.3	47.7	0.6	5.2	9.5	22.3	25.7	31.4	16 5.07	+ 0.87	. .	−28.26	21 15 37.68	− 0.04
	9	β Aquarii. . . .	P.	18.8	21.3	22.7	29.0	31.0	33.1	39.2	40.7	43.3	25 31.02	− 0.93	−28.25	−28.27	21 25 1.82	+ 0.01
	10	β Cephei	P.	54.9	2.3	6.5	24.4	30.7	37.2	54.6	58.8	6.5	27 30.66	+ 1.66	. .	−28.27	21 27 4.05	− 0.27
	11	Saturn I, N. . .	P.	12.0	14.6	16.3	. .	. .	. .	33.2	34.8	37.5	32 24.73	− 1.08	. .	−28.22	21 31 55.43	. .
	12	Saturn II, S. . .	P.	. .	. .	21.7	23.7	25.9	28.1	30.2	. .	. .	32 25.92	− 1.08	. .	−28.22	21 31 56.62	. .
	13	B. A. C. 7632 . .	P.	9.4	12.7	14.7	22.4	25.0	27.6	35.3	37.3	40.6	49 25.00	− 1.49	. .	−28.24	21 48 55.27	− 4.19
	14	B. A. C. 7635 . .	P.	. .	. .	. .	. .	. .	. .	13.5	15.5	18.8	50 3.15	− 1.50	. .	−28.25	21 49 33.40	− 4.21
	15	B. A. C. 7684 . .	P.	52.6	56.0	58.0	6.0	8.7	11.4	19.2	21.3	24.6	59 8.64	− 1.55	. .	−28.26	21 58 38.83	− 4.32
	16	Mural Zones 207, 63	P.	57.7	0.3	1.7	6.0	8.2	10.4	12.5	14.6	. .	2 10.36	− 1.10	. .	−28.27	22 1 40.99	− 3.51
	17	Anonymous . .	P.	. .	. .	. .	. .	. .	20.5	24.8	26.3	29.0	2 16.22	− 1.10	. .	−28.27	22 1 46.85	− 3.51
	18	Mural Zones 207, 70	P.	56.4	59.0	0.5	4.8	7.0	9.1	11.1	13.4	. .	11 9.09	− 1.09	. .	−28.28	22 10 39.72	− 3.52
	19	Mural Zones 207, 71	P.	. .	. .	. .	. .	16.0	18.0	22.5	24.0	26.7	11 13.85	− 1.09	. .	−28.28	22 10 44.48	− 3.52
	20	Niobe	P.	57.8	0.4	2.0	8.3	10.6	12.7	19.1	20.9	23.6	1 10.60	− 0.54	. .	−28.34	23 0 41.72	. .
	21	Weisse 103 . .	P.	53.2	55.9	57.4	1.5	3.5	. .	. .	. .	. .	8 5.60	− 0.98	. .	−28.35	23 7 36.27	− 3.45
	22	Weisse 104 . .	P.	. .	. .	. .	5.8	7.9	10.0	13.9	15.5	. .	8 5.73	− 0.98	. .	−28.35	23 7 36.40	− 3.45
	23	Weisse 109 . .	P.	. .	. .	. .	. .	. .	18.3	22.5	24.1	26.6	8 14.18	− 0.98	. .	−28.35	23 7 44.85	− 3.45
	24	B. A. C. 8172 . .	P.	36.6	39.8	41.7	49.5	52.0	54.5	2.0	3.9	7.0	21 51.89	− 1.46	. .	−28.37	23 21 22.06	− 4.18
	25	λ Draconis, S. P. .	P.	5.8	58.5	53.8	36.3	30.2	24.3	6.4	1.7	54.5	24 30.17	− 3.42	. .	−28.42	11 23 58.33	+ 0.16
	26	B. A. C. 8201 . .	P.	34.3	37.5	39.6	47.4	50.0	52.6	0.3	2.4	5.6	26 50.08	− 1.51	. .	−28.37	23 26 20.20	− 4.26
	27	ι Piscium . . .	P.	51.5	54.0	55.6	1.6	3.8	5.8	12.0	13.5	16.0	34 3.76	− 0.76	−28.40	−28.43	23 33 34.57	− 0.03
	28	Weisse 839 . .	P.	23.4	25.9	27.4	33.6	35.8	37.8	43.8	45.4	48.1	42 35.89	− 0.91	. .	−28.39	23 42 6.59	− 3.40
	29	Eurydice . . .	P.	15.3	17.8	19.3	25.5	27.5	29.7	35.8	37.3	40.0	48 27.58	− 0.86	. .	−28.40	23 47 58.32	. .
	30	B. A. C. 8332 . .	P.	21.9	24.7	31.4	33.5	35.8	38.3	45.3	47.2	50.2	53 35.92	− 1.33	. .	−28.41	23 53 6.18	− 3.91
	31	Concordia . . .	P.	6.0	8.4	10.0	16.4	18.2	20.3	26.5	27.9	30.5	2 18.27	− 0.87	. .	−28.42	0 1 48.98	. .
	32	Lamont 18 . . .	P.	38.8	40.4	44.3	46.4	48.6	50.5	52.6	56.6	58.1	6 48.48	− 0.86	. .	−28.42	0 6 19.20	− 3.36
	33	Victoria . . .	P.	50.0	. .	54.3	58.4	0.5	. .	4.6	6.7	. .	14 2.58	− 0.59	. .	−28.43	0 13 33.56	. .
	34	α Cassiopeæ . . .	P.	35.2	39.8	42.4	53.4	57.0	0.7	11.6	14.3	18.9	33 57.03	+ 0.49	. .	−28.50	0 33 29.02	− 0.05
	35	β Ceti	P.	39.1	41.8	43.5	49.9	52.0	54.1	0.6	2.2	4.9	37 52.01	− 1.12	− 28.46	−28.51	0 37 22.38	0.00
	36	32¹ Camelopard., S. P.	P.	37.5	12.6	57.7	58.3	38.1	17.4	18.9	3.5	39.6	48 38.18	− 9.78	. .	−28.47	12 47 59.93	+ 5.67
	37	32² Camelopard., S. P.	P.	44.4	19.9	4.7	5.9	45.7	26.1	25.8	11.8	46.8	48 45.68	− 9.78	. .	−28.53	12 48 7.37	− 0.75
	38	Echo	P.	3.8	6.4	8.0	14.0	16.2	18.3	24.4	26.0	28.5	57 16.18	− 0.74	. .	−28.48	0 56 46.96	. .
	39	B. A. C. 355 . .	P.	35.5	38.5	40.3	47.6	50.0	52.5	59.7	1.5	4.6	5 50.02	− 1.38	. .	−28.49	1 5 20.15	− 3.76
	40	Polaris	P.	. .	. .	36.0	2.0	29.5	55.0	19.0	. .	. .	13 28.30	+38.08	. .	−28.56	1 13 37.82	− 1.80
	41	θ¹ Ceti.	P.	7.0	9.7	11.3	17.3	19.3	21.4	27.7	29.1	31.8	18 19.40	− 0.97	−28.54	−28.56	1 17 49.87	0.00
	42	B. A. C. 445 . .	P.	14.3	17.3	19.0	26.0	28.5	31.0	38.0	39.7	42.7	23 28.50	− 1.34	. .	−28.52	1 22 58.64	− 3.62
	43	B. A. C. 466 . .	P.	38.9	42.0	43.9	51.7	54.2	57.0	4.4	6.4	9.6	27 54.23	− 1.48	. .	−28.52	1 27 24.23	− 3.76
	44	B. A. C. 526 . .	P.	16.3	19.3	21.4	29.2	31.8	34.4	42.3	44.2	47.6	36 31.83	− 1.52	. .	−28.54	1 36 1.77	− 3.74
	45	B. A. C. 553 . .	P.	38.4	41.8	43.7	51.3	53.9	56.5	4.1	6.2	9.4	42 53.90	− 1.49	. .	−28.55	1 42 23.86	− 3.68
	46	Weisse 791¹ . .	P.	. .	. .	. .	. .	58.8	1.2	5.0	6.6	9.0	45 56.75	− 0.68	. .	−28.55	1 45 27.52	− 3.21
	47	Weisse 791² . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . .	. .
	48	B. A. C. 627 . .	P.	58.0	1.8	3.7	10.8	13.2	15.6	22.7	24.5	27.5	56 13.19	− 1.34	. .	−28.56	1 55 43.29	− 3.44
	49	α Arietis	P.	26.8	29.5	31.2	38.0	40.1	42.3	48.9	50.6	53.4	0 40.09	− 0.46	−28.58	−28.62	2 0 11.01	− 0.03

1, 36, 37. Bisections at sets B and D.
17, 20, 29, 31, 33, 38. Wire A used.
19. Wire B used.
25. Bisections at wires V and VI.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° '	r. "	"	"	"						. .	"	° ' "	°	' "	° ' "	"
1	326 44	9 27.6	25.5	7.0	3.8	36	040	. .	. .	. .	045	30.1	326 47 31.8	. .	− 38.2	17 53 14.8	+ 1.8
2	354 0	27.5	26.0	7.3	2.8	36	615	600	. .	610	620	30.1	354 3 23.4	. .	− 6.1	45 9 38.5	+ 0.2
3	5 20	10 1.0	0.0	12.5	7.1	37	. .	415	. .	420	. .	30.1	5 23 6.5	. .	+ 5.5	56 29 33.2	+16.4
4	72 26	9 29.0	24.2	6.0	2.9	37	. .	. .	. .	245	220	30.1	72 29 13.8	. .	+ 3 2.9	123 38 37.9	+ 0.4
5	358 8	10 0.5	28.0	10.6	5.3	33	350	345	. .	350	280	30.1	358 12 10.9	. .	− 1.8	49 18 30.3	+ 1.8
6	286 32	0.6	23.3	8.3	5.3	37	. .	630	. .	700	. .	30.1	286 35 5.0	. .	− 3 13.6	337 38 12.6	+ 3.6
7	9 6	9 28.1	26.6	8.1	3.5	32	. .	945	. .	980	. .	30.1	9 10 18.3	53.2	+ 9.4	60 16 48.9	+ 0.8
8	336 46	26.5	24.3	5.0	2.5	32	900	875	. .	. .	. .	30.1	336 50 21.9	. .	− 25.0	27 56 18.1	− 1.3
9	44 56	28.4	25.6	7.6	3.4	35	405	400	. .	. .	. .	30.1	44 59 40.7	. .	+ 58.4	96 7 0.3	+ 1.0
10	328 50	10 2.9	29.6	11.0	8.4	37	. .	. .	. .	150	. .	30.1	328 53 11.2	. .	− 35.3	19 58 57.1	− 1.5
11	54 56	9 28.0	24.5	8.1	3.1	35	130	. .	. .	. .	240	30.1	54 59 44.5	. .	+ 1 23.3	106 7 29.0	. .
12	54 56	28.0	24.5	8.1	3.1	34	. .	015	. .	075	. .	30.1	55 0 2.1	. .	+ 1 23.4	106 7 46.7	. .
13	76 36	10 0.5	25.5	7.3	3.8	33	330	325	. .	. .	. .	30.1	76 40 11.6	. .	+ 4 2.1	127 50 34.9	+ 6.1
14	77 6	1.2	27.0	7.5	4.2	35	. .	. .	. .	202	220	30.1	77 9 42.7	. .	+ 4 11.3	128 20 15.2	+ 6.1
15	78 54	0.5	27.0	7.0	4.3	36	330	360	. .	. .	. .	30.1	78 57 24.9	. .	+ 4 51.4	130 8 37.5	+ 6.7
16	55 56	9 28.4	25.4	8.2	2.6	29	260	265	. .	. .	. .	30.1	56 1 14.7	. .	+ 1 26.7	107 9 2.6	+12.0
17	55 56	28.4	25.4	8.2	2.6	23	. .	. .	. .	. .	220	30.1	56 5 20.7	. .	+ 1 26.7	107 13 8.6	+12.0
18	55 26	27.6	24.0	6.4	2.5	27	600	620	. .	. .	. .	30.1	55 31 41.0	. .	+ 1 25.1	106 39 27.3	+12.9
19	55 26	27.6	24.0	6.4	2.5	31	. .	. .	. .	335	345	30.1	55 28 10.9	51.7	+ 1 24.9	106 35 57.0	+12.9
20	20 22	27.3	25.2	9.1	2.6	36	. .	460	. .	515	. .	30.1	20 27 57.6	51.0	+ 21.9	71 34 40.7	− 1.4
21	48 24	28.5	24.6	7.7	2.4	32	. .	460	. .	. .	. .	30.1	48 28 26.3	. .	+ 1 6.2	99 35 53.7	+18.3
22	48 24	28.5	24.6	7.7	2.4	31	. .	. .	. .	820	. .	30.1	48 28 51.9	. .	+ 1 6.2	99 36 19.3	+18.3
23	48 24	28.5	24.6	7.7	2.4	29	. .	. .	. .	070	090	30.1	48 29 18.6	. .	+ 1 6.2	99 36 46.0	+18.3
24	75 0	28.9	24.8	6.0	3.0	35	200	240	. .	. .	. .	30.1	75 3 43.7	. .	+ 3 36.6	126 13 41.5	+16.2
25	288 54	29.5	26.9	7.7	3.8	36	. .	. .	. .	055	040	30.1	288 57 30.1	. .	− 2 49.2	340 1 2.1	+ 1.5
26	77 16	28.5	26.1	5.5	3.1	35	. .	440	. .	470	. .	30.1	77 19 40.4	. .	+ 4 15.4	128 30 17.0	+16.3
27	33 52	29.6	26.5	9.6	5.1	35	115	110	. .	205	240	30.1	33 55 43.2	50.6	+ 39.5	85 2 43.9	+ 1.3
28	44 12	10 0.8	26.8	8.7	4.3	37	862	870	. .	. .	. .	30.1	44 15 1.6	. .	+ 57.2	95 22 20.0	+20.7
29	40 12	0.7	27.7	10.5	4.6	37	. .	420	. .	510	. .	30.1	40 17 40.2	. .	+ 49.8	91 24 51.2	− 6.4
30	68 58	9 29.0	24.9	6.9	3.2	35	. .	490	. .	600	. .	30.1	69 1 38.9	. .	+ 2 32.1	120 10 32.2	+19.8
31	41 20	10 0.1	27.0	9.7	4.0	32	. .	450	. .	430	. .	30.1	41 26 57.9	. .	+ 51.9	92 34 11.0	− 3.2
32	40 44	9 27.9	25.0	8.5	2.4	34	. .	925	. .	960	. .	30.1	40 47 48.4	. .	+ 50.7	91 55 0.3	+22.0
33	23 28	28.7	27.2	9.3	3.9	29	. .	740	. .	775	. .	30.1	23 35 39.4	. .	+ 25.7	74 42 26.3	− 3.4
34	342 58	26.1	24.3	6.1	2.3	32	020	010	. .	040	075	30.1	343 2 34.9	. .	− 17.9	34 8 38.2	+ 0.9
35	57 28	27.9	25.9	9.1	4.3	33	690	720	. .	700	725	30.1	57 32 6.3	49.6	+ 1 32.2	108 39 59.7	+ 0.6
36	302 56	27.2	24.0	5.8	3.3	30	890	. .	. .	. .	930	30.1	303 0 50.2	. .	− 1 30.3	354 5 41.1	+11.2
37	302 56	27.2	24.0	5.8	3.3	32	050	. .	. .	. .	130	30.1	303 0 32.2	. .	− 1 30.3	354 5 23.1	+ 3.3
38	32 26	28.2	25.8	7.2	3.8	39	. .	110	. .	025	. .	30.1	32 31 17.9	. .	+ 37.5	83 38 16.6	− 3.6
39	71 42	29.5	26.0	7.3	3.7	37	665	725	. .	. .	. .	30.1	71 45 4.9	. .	+ 2 56.5	122 54 22.6	+25.1
40	310 12	10 0.6	28.0	10.1	7.0	33	770	755	700	720	755	30.1	310 16 3.9	. .	− 1 9.4	1 21 15.7	+ 0.4
41	47 38	9 29.4	26.9	8.4	3.6	34	435	450	. .	495	490	30.1	47 41 54.4	. .	+ 1 4.6	98 49 20.2	+ 2.0
42	69 20	10 2.9	28.0	11.2	6.8	37	680	700	. .	. .	. .	30.1	69 23 1.9	. .	+ 2 35.2	120 31 58.3	+26.2
43	76 16	2.3	27.2	8.0	5.0	35	145	160	. .	. .	. .	30.1	76 19 42.3	. .	+ 3 57.3	127 30 0.8	+26.5
44	77 32	3.6	29.9	9.5	7.1	38	. .	370	. .	270	. .	30.1	77 34 52.3	. .	+ 4 21.2	128 45 34.7	+27.1
45	76 32	9 29.0	25.4	6.8	2.6	33	210	245	. .	. .	. .	30.1	76 36 13.9	. .	+ 4 2.3	127 46 37.4	+27.4
46	28 38	28.5	25.7	8.6	3.5	37	. .	. .	. .	160	. .	30.1	28 41 14.1	. .	+ 32.2	79 48 7.5	+23.1
47	28 38	28.5	25.7	8.6	3.5	37	. .	. .	. .	. .	380	30.1	28 41 10.9	. .	+ 32.2	79 48 4.3	+23.1
48	69 22	10 0.2	26.9	8.3	5.5	30	990	000	. .	. .	. .	30.1	69 26 46.4	. .	+ 2 35.8	120 35 43.4	+28.0
49	15 58	3.2	0.0	10.4	8.7	38	810	790	. .	820	830	30.1	16 0 44.7	. .	+ 16.9	67 7 22.8	− 2.7

No.	Barom.	At. Ther.
	in.	°
7	30.29	55.1
19	30.28	53.7
20	30.27	52.9
27	30.26	52.7
35	30.25	51.4

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
11	− 0.8	+ 8.8	. .	+ 8.0
12	− 0.8	− 8.9	. .	− 9.7

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Sept. 24	1	Neptune	P.	49.4	52.0	53.5	59.7	1.8	3.9	10.0	11.7	14.4	4 1.82	− 0.67	. .	−28.57	2 3 32.58	. .
	2	B. A. C. 3162^2	F.	19.6	22.7	. .	29.6	. .	37.2	. .	. .	50.0	11 34.86	− 0.12	. .	−29.29	9 11 5.45	− 1.79
	3	Moon II, S.	F.	. .	. .	26.2	28.5	30.7	32.8	35.0	. .	. .	14 30.64	− 0.49	. .	−29.30	9 14 0.85	−69.95
	4	α Hydræ	F.	45.5	48.2	49.6	55.9	57.9	59.9	6.1	7.6	10.3	21 57.89	− 0.95	−29.27	−29.35	9 21 27.59	− 0.11
	5	θ Ursæ Majoris	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	6	ε Leonis	F.	3.0	5.8	7.4	14.1	16.3	18.5	25.3	27.0	29.8	39 16.36	− 0.41	−29.31	−29.38	9 38 46.57	− 0.13
	7	μ Leonis	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	8	B. A. C. 3453	F.	. .	. .	58.1	0.0	2.0	4.2	6.4	. .	. .	1 2.14	− 0.54	. .	−29.37	10 0 32.23	− 1.29
	9	α Leonis	F.	1.6	4.1	5.6	. .	. .	. .	. .	. .	. .	2 14.05	− 0.62	−29.41	−29.40	10 1 44.03	− 0.03
	10	γ^1 Leonis	F.	22.7	25.6	27.1	33.7	35.8	38.0	44.5	46.2	48.9	13 35.83	− 0.48	−29.36	−29.41	10 13 5.94	− 0.07
	11	ρ Leonis	F.	. .	. .	42.8	44.9	47.0	49.0	53.0	54.7	57.2	26 44.83	− 0.67	−29.57	−29.43	10 26 14.73	− 0.13
	12	α Ursæ Majoris	F.	3.4	8.8	12.0	25.2	29.7	34.0	47.3	50.5	56.3	56 29.69	+ 0.99	. .	−29.47	10 56 1.21	+ 0.21
	13	δ Leonis	F.	45.4	48.0	19.8	56.4	58.5	0.6	7.3	8.9	11.6	7 58.50	− 0.47	−29.40	−29.48	11 7 28.55	− 0.14
	14	λ Draconis	F.	. .	. .	14.3	20.6	26.1	32.4	38.4	. .	. .	24 26.36	+ 1.80	. .	−29.49	11 23 58.67	+ 0.49
	15	γ Cephei, S. P.	F.	46.0	35.0	28.5	10.1	51.8	33.7	16.4	9.5	58.5	34 52.17	− 5.19	. .	−29.51	23 34 17.47	− 0.69
	16	β Leonis	F.	59.5	2.2	3.7	10.0	12.2	14.3	20.5	22.1	24.8	43 12.14	− 0.58	−29.64	−29.53	11 42 42.03	+ 0.09
	17	B. A. C. 4002	F.	. .	. .	. .	. .	44.6	46.5	50.7	52.3	54.9	44 42.54	− 0.78	. .	−29.54	11 44 12.22	− 0.87
25	18	Sun I, S.	F.	17.5	20.0	21.6	27.9	29.8	31.9	38.0	39.4	42.2	7 29.81	− 0.84	. .	−29.57	12 6 59.40	. .
	19	Sun II, N.	F.	25.9	28.4	29.9	35.9	38.0	40.1	46.2	47.7	50.4	9 38.06	− 0.84	. .	−29.57	12 9 7.65	. .
	20	Polaris, S. P.	F.	. .	. .	45.0	18.0	52.0	25.0	58.0	. .	. .	14 51.60	−42.58	. .	−29.63	1 13 39.39	− 0.35
	21	α Virginis	F.	. .	3.9	5.9	8.0	10.2	12.2	16.3	17.9	20.6	19 8.05	− 0.99	−29.66	−29.64	13 18 37.42	0.00
	22	Mercury I, C.	F.	21.8	24.4	26.1	32.3	34.4	36.3	42.8	44.1	46.9	32 34.34	− 1.00	. .	−29.72	13 32 3.62	+ 0.20
	23	η Ursæ Majoris	F.	47.6	51.6	54.0	0.4	6.8	13.2	19.2	21.6	25.9	43 6.70	+ 0.29	. .	−29.67	13 42 37.32	− 0.05
27	24	Polaris, S. P.	F.	24.0	39.0	35.0	. .	. .	. .	. .	. .	. .	14 48.68	−35.93	. .	−32.60	1 13 40.15	0.00
	25	B. A. C. 6368	F.	17.0	21.4	24.0	34.8	38.5	41.9	52.8	55.3	59.7	36 38.38	+ 0.39	. .	−32.89	18 36 5.88	− 0.82
	26	XVIII, 20	F.	. .	. .	. .	. .	27.2	29.2	33.7	35.4	38.2	39 24.89	− 1.05	. .	−32.89	18 38 50.95	− 2.62
	27	XVIII, 22	F.	. .	. .	33.4	35.7	38.0	40.6	45.7	47.5	50.7	41 35.70	− 1.25	. .	−32.89	18 41 1.56	− 2.95
	28	B. A. C. 6487	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	29	B. A. C. 6594	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	30	δ Aquilæ	F.	35.5	38.0	39.6	45.7	47.8	49.9	56.0	57.5	59.9	19 47.77	− 0.70	−32.96	−32.94	19 19 14.13	+ 0.07
	31	B. A. C. 6680	F.	57.0	58.8	3.6	5.9	8.4	10.8	13.2	18.0	19.6	25 8.37	− 1.18	. .	−32.93	19 24 34.26	− 3.17
	32	Anonymous	F.	. .	. .	. .	. .	. .	. .	35.0	36.7	39.7	28 25.81	− 1.11	. .	−32.93	19 27 51.77	− 3.06
	33	Mural Zones 176, 77	F.	. .	45.5	47.6	50.3	52.4	54.7	59.1	1.0	3.9	28 50.07	− 1.11	. .	−32.93	19 28 16.03	− 3.06
	34	Mural Zones 176, 78	F.	. .	. .	. .	. .	31.0	33.4	37.9	39.4	42.3	29 28.62	− 1.11	. .	−32.93	19 28 54.58	− 3.07
	35	γ Aquilæ	F.	42.5	45.0	46.6	52.8	54.8	56.9	3.3	4.9	7.6	40 54.93	− 0.61	−32.95	−32.96	19 40 21.36	+ 0.02
	36	α Aquilæ	F.	4.8	7.2	8.7	15.0	17.1	19.1	25.2	26.8	29.4	45 17.03	− 0.63	−32.91	−32.97	19 44 43.43	− 0.02
	37	XIX, 15	F.	40.0	42.8	44.5	51.5	53.7	56.1	2.9	4.7	7.5	49 53.74	− 1.12	. .	−32.95	19 49 19.67	− 3.22
	38	XIX, 16	F.	27.7	30.5	32.4	39.5	41.9	44.3	51.3	53.1	56.2	51 41.88	− 1.18	. .	−32.95	19 51 7.75	− 3.33
	39	λ Ursæ Minoris	F.	. .	. .	. .	. .	. .	. .	56.5	17.0	35.0	48 35.50	+43.82	. .	−32.97	19 48 46.35	− 0.29
	40	α Cephei	F.	49.3	52.5	1.2	5.5	10.0	14.2	18.7	27.2	30.4	16 9.89	+ 0.76	. .	−33.05	21 15 37.60	− 0.03
	41	d Ursæ Majoris, S.P.	F.	38.3	31.2	26.2	8.2	1.6	55.9	38.0	33.5	25.7	24 2.02	− 3.17	. .	−33.05	9 23 25.80	− 0.16
	42	β Aquarii	F.	23.4	26.0	27.5	33.6	35.7	37.8	43.9	45.4	48.1	25 35.71	− 0.82	−33.08	−33.05	21 25 1.84	+ 0.06
	43	Saturn I, N.	F.	45.2	47.9	49.3	. .	. .	. .	6.5	8.2	10.7	31 57.97	− 0.96	. .	−33.04	21 31 23.97	. .
	44	Saturn II, S.	F.	. .	. .	55.0	57.0	59.2	1.4	3.6	. .	. .	31 59.24	− 0.96	. .	−33.04	21 31 25.24	. .
	45	11 Cephei	F.	. .	. .	. .	38.4	44.7	. .	2.9	8.0	15.6	40 38.33	+ 1.57	. .	−33.07	21 40 6.83	− 0.28
	46	79 Draconis (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	47	Anonymous	F.	10.7	13.3	15.2	21.3	23.4	25.6	31.9	33.6	36.3	0 23.48	− 0.97	. .	−33.06	21 59 49.45	− 3.49
	48	Anonymous	F.	8.0	10.6	12.2	18.9	20.8	23.0	29.3	31.0	33.7	2 20.83	− 0.97	. .	−33.06	22 1 46.80	− 3.50

2, 27. Telescope micrometer reading decreased one revolution in reduction.
13. Bisections at wires II and V.
15, 39, 47. Telescope micrometer reading increased one revolution in reduction.
25, 39, 40, 41, 45. Bisections at sets B and D.
32. Wire A used.
33, 47, 48. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	28 12	10 1.7	28.5	11.6	6.3	36	435	460	. .	480	470	30.1	28 15 21.7	48.6	+ 31.6	79 22 14.5	. .
2	1 30	9 27.2	25.6	9.1	3.2	35	440	440	. .	. .	. .	30.1	1 33 55.9	. .	+ 1.6	52 40 18.7	− 5.2
3	18 48	27.0	25.2	11.1	3.9	37	. .	580	332	878	. .	30.1	18 51 12.1	56.0	+ 19.8	69 57 53.1	. .
4	46 56	21.2	18.0	1.9	28.6	36	025	048	. .	125	144	30.1	46 59 36.9	. .	+ 1 2.0	98 7 0.1	+ 2.1
5	346 36	21.6	19.3	3.0	29.6	37	. .	. .	. .	. .	248	30.1	346 39 19.6	. .	− 13.7	37 45 27.1	+ 1.7
6	14 28	27.5	26.1	10.5	4.0	32	. .	030	. .	046	. .	30.1	14 32 32.0	. .	+ 15.0	65 39 8.2	+ 1.5
7	12 14	29.8	26.5	11.8	5.5	34	. .	. .	. .	710	732	30.1	12 17 49.6	. .	+ 12.6	63 24 23.4	+ 0.9
8	21 28	24.5	21.8	7.2	0.7	38	025	042	. .	. .	. .	30.1	21 30 53.3	. .	+ 22.7	72 37 47.2	− 2.3
9	26 14	27.0	23.7	8.1	2.6	31	. .	. .	. .	950	966	30.1	26 18 35.2	. .	+ 28.5	77 25 24.9	+ 3.0
10	18 20	28.6	26.5	10.9	5.0	30	. .	008	. .	022	. .	30.1	18 24 2.2	. .	+ 19.2	69 31 42.6	+ 3.1
11	28 52	27.2	22.0	6.2	2.2	33	. .	. .	. .	456	464	30.1	28 56 13.1	. .	+ 31.8	80 3 6.1	+ 1.4
12	336 24	21.9	20.2	1 9	0.1	31	. .	542	. .	556	. .	30.1	336 27 46.0	. .	− 24.9	27 33 42.3	+ 0.9
13	17 36	26.3	24.6	8.6	2.0	30	. .	305	. .	. .	315	26.0	17 40 55.8	. .	+ 18.2	68 47 35.2	+ 0.3
14	328 48	22.3	19.4	4.8	1.2	29	. .	. .	. .	676	668	26.0	328 53 10.8	. .	− 34.4	19 58 57.6	− 2.0
15	295 48	25.6	16.3	5.0	6.2	32	. .	952	. .	105	. .	26.0	295 51 59.5	. .	− 1 56.8	346 56 23.9	+ 1.5
16	23 32	28.5	21.5	15.5	11.7	29	. .	. .	. .	435	440	26.0	23 37 5.7	. .	+ 24.8	74 43 51.7	+ 1.9
17	36 20	23.6	16.1	7.9	3.6	30	. .	. .	. .	436	536	26.0	36 24 56.0	65.6	+ 41.9	87 31 59.1	− 4.9
18	39 58	24.7	21.3	3.1	29.5	36	624	600	. .	. .	. .	26.0	40 1 23.0	. .	+ 47.6	91 8 31.8	. .
19	39 26	26.7	21.5	6.3	1.6	36	. .	. .	. .	356	332	26.0	39 29 24.2	66.2	+ 46.7	90 36 32.1	. .
20	307 30	27.1	24.2	6.5	4.7	35	448	452	458	455	440	26.0	307 33 36.6	. .	− 1 13.1	357 38 44.7	− 0.2
21	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
22	50 16	25.7	20 3	5.1	0.0	34	. .	710	. .	632	. .	26.0	50 19 51.5	69.5	+ 1 7.7	101 27 20.4	. .
23	348 54	22.5	20.1	2.5	29.7	35	. .	520	. .	570	. .	26.0	348 57 40.2	. .	− 11.0	40 3 50.4	+ 0.8
24	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
25	343 42	10 0.5	28.4	10.7	5.5	34	. .	. .	. .	364	364	30.8	343 45 55.4	. .	− 16.6	34 52 0.0	+12.7
26	61 20	9 29.6	26.9	11.0	4.8	36	. .	. .	. .	952	942	30.8	61 23 16.4	. .	+ 1 43.8	112 31 21.4	− 6.9
27	73 40	10 3.7	28.5	11.0	7.0	36	. .	. .	. .	836	852	30.8	73 43 31.2	. .	+ 3 12.0	124 53 4.4	−11.0
28	23 56	2.3	27.9	12.0	4.6	37	370	376	. .	. .	. .	30.8	23 59 8.4	. .	+ 25.3	75 5 54.9	+ 6.5
29	70 50	2.0	28.1	10.0	6.0	34	. .	. .	. .	736	750	30.8	70 53 49.1	60.8	+ 2 43.1	122 2 53.4	− 7.7
30	35 56	2.6	28.0	11.8	4.1	30	. .	. .	. .	716	678	30.8	36 0 51.3	. .	+ 41.5	87 7 54.0	+ 1.6
31	69 54	0.1	24.0	7.2	2.2	30	265	255	. .	. .	. .	30.8	69 59 0.2	. .	+ 2 35.4	121 7 56.5	− 6.4
32	65 24	9 28.3	22.8	7.5	2.0	29	042	044	. .	. .	. .	30.8	65 31 52.6	. .	+ 2 4.8	116 40 18.6	− 4.6
33	65 24	9 28.3	22.8	7.5	2.0	32	. .	. .	. .	042	050	30.8	65 26 1.6	. .	+ 2 4.4	116 34 27.2	− 4.5
34	65 24	9 28.3	22.8	7.5	2.0	36	. .	. .	. .	878	890	30.8	65 27 20.3	. .	+ 2 4.5	116 35 46.0	− 4.4
35	28 30	10 6.8	3.8	15.4	10.6	31	. .	050	. .	050	. .	30.8	28 34 25.3	. .	+ 31.2	79 41 17.7	+ 3.0
36	30 16	2.7	28.9	10.5	4.7	31	. .	640	. .	658	. .	30.8	30 20 36.4	. .	+ 33.5	81 27 31.1	+ 2.9
37	66 18	9 26.5	23.3	3.3	1.2	36	. .	288	. .	340	. .	30.8	66 21 30.3	. .	+ 2 10.0	117 30 1.5	− 3.0
38	69 40	10 2.1	26.9	8.4	4.5	36	. .	320	. .	320	. .	30.8	69 43 25.8	. .	+ 2 33.8	120 52 20.8	− 4.0
39	309 54	2.2	1.7	13.1	8.4	30	. .	. .	. .	255	340	30.8	309 58 42.8	58.5	− 1 8.2	1 3 55.8	+ 2.0
40	336 46	9 29.9	26.8	7.4	4.3	32	656	. .	. .	. .	656	30.8	336 50 23.1	. .	− 24.6	27 56 19.7	+ 1.0
41	289 14	29.0	27.1	8.3	4.5	30	. .	972	. .	975	. .	30.8	289 18 48.5	. .	− 2 42.7	340 22 27.0	+ 1.6
42	44 56	29.2	26.1	9.0	2.6	35	. .	. .	. .	352	360	30.8	44 59 42.0	. .	+ 57.5	96 7 0.7	+ 1.4
43	54 58	10 0.5	26.9	9.8	5.0	33	208	. .	. .	. .	240	30.8	55 2 13.1	. .	+ 1 22.2	106 9 56.5	. .
44	54 58	0.5	26.9	9.8	5.0	32	. .	020	. .	086	. .	30.8	55 2 31.2	. .	+ 1 22.2	106 10 14.6	. .
45	328 6	9 29.1	26.4	8.1	5.3	35	. .	. .	. .	104	096	30.8	328 9 45.7	. .	− 35.8	19 15 31.1	0.0
46	214 8	10 2.8	29.3	10.7	3.9	31	. .	. .	. .	232	200	30.8	214 12 40.0	. .	+ 39.3	16 53 1.9	+ 0.8
47	56 6	9 29.5	26.5	8.8	2.5	32	. .	585	. .	585	. .	30.8	56 7 36.1	. .	+ 1 25.7	107 15 23.0	+11.6
48	56 6	29.5	26.5	8.8	2.5	42	. .	255	. .	240	. .	30.8	56 5 23.4	55.5	+ 1 25.4	107 13 10.0	+11.8

No.	Barom.	At Ther.
	in.	°
1	30.23	50.5
3	30.21	56.0
17	30.17	64.5
19	30.15	65.5
22	30.09	68.5
29	30.02	63.0
39	30.01	60.5
48	30.02	58.9

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
1	− 0.1	. .	. .	− 0.1
3	−18 27.1	− 15 45.4	. .	− 34 12.5
18	− 5.7	− 15 59.8	. .	− 16 5.5
19	− 5.6	+ 15 59.8	. .	+ 15 54.2
22	− 5.8	. .	0.0	− 5.8
43	− 0.8	+ 9.1	. .	+ 8.3
44	− 0.8	− 9.0	. .	− 9.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Sept. 27	1	Mural Zones 207, 70	F.	1.0	3.6	5.4	. .	. .	. .	. .	23.9	26.5	11 13.78	− 0.90	. .	−33.07	22 10 39.75	− 3.50
	2	Mural Zones 207, 71	F.	. .	. .	14.4	16.5	18.8	20.8	. .	. .	. .	11 18.69	− 0.90	. .	−33.07	22 10 44.66	− 3.50
	3	Lalande 43567.	F.	11.6	14.2	15.8	22.0	24.2	26.3	32.7	34.4	37.0	14 24.24	− 0.9[illegible]	. .	−33.07	22 13 50.23	− 3.48
	4	Lalande 43596.	F.	15.4	18.0	19.6	26.0	28.1	30.2	36.0	38.0	40.7	15 28.07	− 0.9[illegible]	. .	−33.07	22 14 54.06	− 3.48
	5	B. A. C. 7826	F.	42.2	45.6	47.5	55.4	58.0	0.6	8.8	10.6	14.0	21 58.08	− 1.3[illegible]	. .	−33.07	22 21 23.67	− 4.32
	6	226 Cephei (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	7	ι Cephei (R)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	8	B. A. C. 7998	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	9	α Pegasi (R.).	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	10	Weisse 22¹.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	11	Weisse 103	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	12	Weisse 104	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	13	Weisse 109.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	14	Metis	F.	21.2	23.7	25.3	31.4	33.5	35.4	41.7	43.5	45.8	57 33.50	− 0.88	. .	−33.16	23 56 59.46	. .
	15	Concordia	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	16	γ Pegasi	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	17	Lalande 512	F.	24.9	27.4	28.9	35.0	37.0	39.0	45.2	46.7	49.4	19 37.03	− 0.73	. .	−33.17	0 19 3.13	− 3.34
	18	B. A. C. 104	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	19	κ Draconis, S. P.	F.	. .	. .	56.6	50.5	44.3	38.4	32.3	. .	. .	28 44.42	− 3.18	. .	−33.23	12 28 8.01	− 0.10
	20	α Cassiopeæ.	F.	40.2	44.6	47.4	58.3	2.0	5.8	16.5	9.0	23.7	34 1.94	+ 0.42	. .	−33.23	0 33 29.13	+ 0.03
	21	B. A. C. 192	F.	4.9	10.0	15.3	18.1	20.5	23.3	26.0	31.1	36.5	37 20.62	− 1.33	.	−33.18	0 36 46.11	− 4.11
	22	B. A. C. 202	F.	32.4	35.7	37.6	45.4	48.1	50.8	58.0	0.4	4.0	38 48.11	− 1.33	.	−33.18	0 38 13.60	− 4.10
	23	Schjellerup 337	F.	16.8	19.2	20.8	26.9	28.9	31.0	37.3	38.7	41.3	52 28.99	− 0.70	.	−33.20	0 51 55.09	− 3.32
	24	Durch. 3°, 133.	F.	. .	48.4	50.5	52.5	54.6	56.6	0.7	2.2	4.9	52 52.53	− 0.70	.	−33.20	0 52 18.63	− 3.32
	25	B. A. C. 303	F.	48.9	51.6	53.3	59.3	1.3	3.4	9.6	11.1	13.7	59 1.36	− 0.6[illegible]	.	−33.21	0 53 27 47	− 3.31
	26	Polaris	F.	. .	. .	48.0	13.0	38.0	. .	. .	. .	. .	13 39.80	+34.28	. .	−33.27	1 13 40.81	+ 0.57
	27	θ¹ Ceti.	F.	11.7	14.5	15.9	22.2	24.2	26.2	32.5	33.9	36.6	18 24.19	− 0.80	−33.40	−33.27	1 17 50.06	+ 0.15
	28	η Piscium	F.	12.2	14.7	16.5	22.8	24.9	27.1	33.5	35.0	37.6	25 24.92	− 0.54	−33.31	−33.28	1 24 51.10	+ 0.10
	29	ο Piscium	F.	12.4	14.9	16.4	22.7	24.8	26.8	33.0	34.6	37.0	39 24.73	− 0.63	−33.14	−33.30	1 38 50.80	− 0.19
	30	B. A. C. 569	F.	20.5	23.4	25.2	32.2	34.5	36.8	43.9	45.6	48.6	46 34.52	− 0.32	. .	−33.25	1 46 0.95	− 3.34
	31	β Arietis	F.	8.3	11.0	12.6	19.1	21.3	23.4	30.0	31.6	34.3	48 21.29	− 0.46	−33.29	−33.31	1 47 47.52	0.00
	32	B. A. C. 609	F.	9.0	11 6	13.2	19.4	21.6	23.7	29.9	31.3	33.9	53 21.51	− 0.59	. .	−33.25	1 52 47.67	− 3.25
	33	B. A. C. 627	F.	3.7	6.6	8.5	15.6	17.8	20.0	27.5	29.0	32.2	56 17.88	− 1.17	. .	−33.25	1 55 43.46	− 3.50
	34	α Arietis	F.	31.6	34.3	36.0	42.5	44.9	47.1	53.7	55.4	58.2	0 44.86	− 0.42	−33.33	−33.32	2 0 11.12	+ 0.02
	35	Neptune	F.	38.0	40.5	42.2	48.4	50.4	52.4	58.7	0.2	2.8	3 50.40	− 0.60	. .	−33.26	2 3 16.54	. .
29	36	δ Ursæ Minoris	F.	. .	. .	. .	11.5	47.0	21.5	. .	. .	. .	12 46.69	+12.80	. .	−35.38	18 12 24.11	+ 0.18
	37	B. A. C. 6235	F.	50.6	53.9	55.6	3.2	5.8	8.2	15.8	17.8	21.0	16 5.77	− 0 23	. .	−35.35	18 15 30.19	− 1.33
	38	B. A. C. 6245	F.	. .	. .	51.0	53.0	55.2	57.4	59.6	. .	. .	17 55.24	− 0.53	. .	−35.35	18 17 19.36	− 1.75
	39	α Lyræ	F.	3.7	6.9	8.8	16.6	19.3	21.8	29.7	31.7	34.9	33 19.27	− 0.17	−35.45	−35.39	18 32 43.71	− 0.02
	40	XVIII, 19	F.	4.3	7.0	8.6	15.0	17.2	19.4	26.0	27.5	30.3	39 17.26	− 1.01	. .	−35.38	18 38 40.87	− 2.54
	41	XVIII, 21	F.	. .	. .	. .	. .	. .	. .	32.9	34.6	37.5	40 23.59	− 1.12	. .	−35.38	18 39 47.09	− 2.74
	42	B. A. C. 6427	F.	. .	. .	. .	. .	52.5	55.0	59.9	1.7	4.7	45 50.18	− 0.30	. .	−35.38	18 45 14.50	− 1.58
	43	XVIII, 23	F.	57.8	0.6	2.2	8.7	11.0	13.1	19.8	21.4	24.1	47 10.97	− 1.02	. .	−35.38	18 46 34.57	− 2.63
	44	Anonymous	F.	26.2	29.3	31.0	37.9	40.3	42.6	49.7	51.5	54.6	50 40.34	− 1.13	. .	−35.39	18 49 3.82	− 2.82
	45	ζ Aquilæ.	F.	5.2	7.9	9.5	15.8	17.9	20.0	26.3	27.8	30.5	0 17.88	− 0.59	−35.36	−35.42	18 59 41.87	+ 0.02
	46	δ Draconis	F.	. .	. .	55.0	0.4	5.8	11.0	16.2	. .	. .	13 5.68	+ 1.10	. .	−35.42	19 12 31.36	− 0.10
	47	Anonymous	F.	14.7	17.5	19.2	26.0	28.3	30.6	37.6	39.4	42.0	28 28.37	− 1.10	. .	−35.44	19 27 51.83	− 3.03
	48	γ Aquilæ.	F.	44.9	47.7	49.0	55.4	57.5	59.5	5.7	7.2	9.8	40 57.41	− 0.63	−35.44	−35.45	19 40 21.33	+ 0.02
	49	α Aquilæ.	F.	7.0	9.7	11.3	17.5	19.5	21.6	27.8	29.2	31.9	45 19.50	− 0.65	−35.40	−35.45	19 44 43.41	− 0.01

1, 3, 14, 15, 24, 44, 47. Wire A used.
4, 22. Wire B used.
7, 10, 19. Bisections at sets B and D.
18. Telescope micrometer reading reduced for $31^{r}.638$.
37. Bisection at wire C_1.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	55 26	9 25.6	22.3	5.4	29.8	37	554	586	. .	. .	. .	30.8	55 31 44.0	. .	+ 1 23.8	106 39 29.0	+12.7
2	55 26	25.6	22.3	5.4	29.8	41	. .	. .	. .	242	256	30.8	55 28 15.4	. .	+ 1 23.6	106 36 0.2	+12.7
3	53 56	10 3.0	29.8	12.6	6.3	32	. .	. .	. .	224	176	30.8	54 2 59.7	. .	+ 1 19.4	105 10 40.3	+13.3
4	53 56	3.0	29.8	12.6	6.3	34	. .	. .	. .	682	616	30.8	53 57 16.6	. .	+ 1 19.1	105 4 56.9	+13.4
5	78 30	4.2	29.0	9.3	6.1	31	. .	. .	. .	428	432	30.8	78 34 39.1	. .	+ 4 37.7	129 45 38.0	+ 8.8
6	216 36	2.4	29.0	11.1	5.0	30	. .	. .	. .	360	256	30.8	216 40 54.9	. .	+ 43.0	14 24 43.3	− 1.4
7	206 34	1.5	28.9	9.0	2.8	30	. .	. .	. .	824	840	30.8	206 38 49.9	. .	+ 29.0	24 27 2.3	− 2.3
8	74 58	9 28.3	23.5	5.5	1.9	37	. .	. .	. .	612	620	30.8	75 1 9.3	. .	+ 3 32.2	126 11 2.7	+12.7
9	155 34	10 1.8	29.6	11.2	6.3	29	. .	. .	. .	628	656	30.8	155 39 6.7	. .	− 26.1	75 27 40.6	+ 1.1
10	47 34	28.7	25.9	9.4	3.0	37	834	. .	. .	. .	854	30.8	47 37 3.9	. .	+ 1 3.2	98 44 28.3	+18.1
11	48 24	0.2	27.4	10.2	4.2	32	204	232	. .	. .	. .	30.8	48 28 28.4	. .	+ 1 5.1	99 35 54.7	+18.2
12	48 24	0.2	27.4	10.2	4.2	30	. .	. .	. .	462	540	30.8	48 28 55.3	. .	+ 1 5.1	99 36 21.6	+18.2
13	48 24	0.2	27.4	10.2	4.2	28	. .	. .	. .	. .	872	30.8	48 29 20.3	. .	+ 1 5.1	99 36 46.6	+18.2
14	49 16	9 25.6	22.6	5.5	0.3	36	. .	356	. .	278	. .	30.8	49 22 3.4	. .	+ 1 7.2	100 29 31.8	− 5.2
15	41 42	27.6	24.3	8.1	1.7	40	. .	114	. .	110	. .	30.8	41 47 3.4	. .	+ 51.6	92 54 16.2	− 3.2
16	24 20	29.6	26.8	10.1	3.7	35	922	924	. .	942	946	30.8	24 23 32.5	54.3	+ 26.2	75 30 19.9	+ 1.6
17	37 34	10 6.5	1.9	15.4	9.5	34	912	920	. .	950	956	30.8	37 37 41.9	. .	+ 44.5	88 44 47.6	+22.6
18	79 20	9 29.2	25.6	6.3	7.2	32	. .	. .	. .	042	034	30.8	79 24 38.5	. .	+ 4 59.5	130 35 59.2	+20.9
19	289 20	10 0.4	28.8	9.7	5.8	30	860	890	. .	. .	. .	30.8	289 24 48.4	. .	− 2 42.5	340 28 27.1	+ 1.2
20	342 58	1.0	28.0	9.3	4.1	32	. .	970	. .	. .	. .	30.8	343 2 32.7	. .	− 17.6	34 8 36.3	0.0
21	77 52	7.0	3.1	13.2	10.0	26	. .	. .	. .	540	525	30.8	77 57 50.4	. .	+ 4 24.4	129 8 36.0	+22.2
22	77 52	7.0	3.1	13.2	10.0	25	. .	. .	. .	620	570	30.8	77 55 32.1	. .	+ 4 23.7	129 6 17.0	+22.4
23	35 14	2.1	28.4	10.7	4.7	44	632	638	. .	. .	. .	30.8	35 15 17.4	. .	+ 40.8	86 22 19.4	+23.5
24	35 14	2.1	28.4	10.7	4.7	33	. .	. .	. .	160	165	30.8	35 20 46.6	. .	+ 40.9	86 27 48.7	+23.5
25	33 48	2.0	28.4	11.0	5.9	28	. .	322	. .	338	. .	30.8	33 53 27.0	. .	+ 38.8	85 0 27.0	+23.5
26	310 12	0.7	23.4	9.8	5.1	33	904	928	944	. .	. .	30.8	310 16 3.5	. .	− 1 8.2	1 21 16.5	+ 2.4
27	47 38	9 27.5	24.8	6.3	0.6	34	. .	444	. .	454	. .	30.8	47 41 57.8	. .	+ 1 3.5	98 49 22.5	+ 4.3
28	24 8	28.4	25.5	8.5	2.3	38	962	970	. .	. .	. .	30.8	24 10 47.1	53.8	+ 26.0	75 17 34.3	+ 0.9
29	30 18	10 0.0	28.5	9.3	3.5	37	. .	918	. .	930	. .	30.8	30 21 1.6	. .	+ 33.9	81 27 56.7	+ 0.7
30	9 50	0.8	29.7	12.0	5.0	30	028	054	. .	. .	. .	30.8	9 55 0.7	. .	+ 10.1	61 1 32.0	+20.4
31	18 38	1.8	1.5	14.0	6.5	37	. .	000	. .	020	. .	30.8	18 41 12.6	. .	+ 19.6	69 47 53.4	+ 2.2
32	27 8	9 28.2	25.1	7.3	2.2	36	. .	160	. .	178	. .	30.8	27 11 30.7	. .	+ 29.7	78 18 21.6	+23.1
33	69 22	10 1.2	26.2	8.4	4.1	30	. .	876	. .	886	. .	30.8	69 26 49.6	. .	+ 2 33.1	120 35 43.9	+27.5
34	15 58	1.2	29.2	11.5	5.7	38	. .	654	. .	652	. .	30.8	16 0 49.0	. .	+ 16.6	67 7 26.8	+ 1.8
35	28 12	2.5	29.6	11.3	5.3	30	. .	388	. .	402	. .	30.8	28 16 55.1	53.5	+ 31.2	79 23 47.5	. .
36	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
37	2 50	1.0	28.0	9.5	3.8	38	514	. .	. .	. .	. .	31.3	2 52 52.7	. .	+ 2.8	53 59 16.7	+ 9.0
38	21 4	9 27.7	26.4	8.5	1.4	36	. .	. .	. .	980	978	31.3	21 7 18.9	. .	+ 21.7	72 14 1.8	+ 4.9
39	0 10	10 5.6	28.4	13.6	8.9	36	314	314	. .	. .	. .	31.3	0 13 23.0	. .	+ 0.2	51 19 44.4	+ 1.8
40	58 32	1.4	28.2	10.1	4.6	32	962	964	. .	. .	. .	31.3	58 36 16.8	. .	+ 1 31.8	109 44 9.8	− 5.8
41	67 12	1.3	28.1	9.8	4.3	33	. .	. .	. .	136	146	31.3	67 16 14.8	. .	+ 2 13.4	118 24 49.4	− 8.8
42	6 26	0.6	27.3	10.3	3.0	38	. .	. .	. .	. .	498	31.3	6 28 54.2	. .	+ 6.4	57 35 21.8	+10.2
43	60 18	1.8	28.1	11.3	5.2	31	. .	. .	040	. .	. .	31.3	60 22 46.2	. .	+ 1 38.6	111 30 46.0	− 5.9
44	67 46	1.0	26.5	9.3	3.8	33	. .	360	. .	366	. .	31.3	67 52 44.8	. .	+ 2 17.5	119 1 23.5	− 8.4
45	25 8	9 29.5	26.6	9.0	2.3	32	. .	770	. .	792	. .	31.3	25 12 21.9	66.2	+ 26.5	76 19 9.6	+ 2.1
46	331 24	28.7	24.5	6.2	2.1	36	616	594	. .	. .	. .	31.3	331 27 24.8	. .	− 30.6	22 33 15.4	+ 0.1
47	65 24	29.8	25.7	8.3	2.7	29	012	026	. .	. .	. .	31.3	65 31 52.0	. .	+ 2 3.3	116 40 16.5	− 4.6
48	28 30	10 3.7	1.2	11.8	6.9	32	. .	340	. .	350	. .	31.3	28 34 24.5	. .	+ 30.8	79 41 16.5	+ 1.9
49	30 16	2.2	29.3	9.7	3.8	31	716	744	. .	. .	. .	31.3	30 20 35.7	. .	+ 33.1	81 27 30.0	+ 1.9

No.	Barom.	At. Ther.
	in.	°
16	30.03	58.0
28	30.01	56.5
35	30.02	55.8
45	29.95	67.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
35	− 0.1	. .	. .	− 0.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Sept. 29	1	XIX, 15 . . .	F.	42.5	45.4	47.1	54.0	56.4	58.7	5.6	7.3	10.1	49 56.34	− 1.11	. .	−35.46	19 49 19.77	− 3.18
	2	XIX, 16 . . .	F.	30.0	33.2	35.0	42.0	44.4	46.8	54.0	55.7	58.8	51 44.43	− 1.16	. .	−35.46	19 51 7.81	− 3.30
	3	B. A. C. 6886 . .	F.	59.1	2.2	4.0	11.4	13.7	16.2	23.6	25.3	28.5	58 13.78	− 1.20	. .	−35.47	19 57 37.11	− 3.42
	4	B. A. C. 6922 . .	F.	24.0	27.1	29.0	36.6	39.2	41.8	49.3	51.2	54.5	3 39.19	− 1.25	. .	−35.47	20 3 2.47	− 3.57
	5	B. A. C. 6934 . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	6	α² Capricorni . .	F.	34.0	36.6	38.0	44.4	46.4	48.5	54.8	56.4	59.0	11 46.46	− 0.92	−35.53	−35.47	20 11 10.07	+ 0.10
	7	B. A. C. 7025 . .	F.	11.9	15.0	16.9	24.7	27.4	30.0	37.8	39.5	42.9	19 27.34	− 1.27	. .	−35.49	20 18 50.58	− 3.72
	8	B. A. C. 7036 . .	F.	. .	. .	20.6	23.1	25.8	28.3	30.8	. .	. .	21 25.72	− 1.24	. .	−35.49	20 20 48.99	− 3.66
	9	ε Delphini . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	10	Groombridge 3241	F.	. .	. .	. .	. .	. .	. .	33.3	38.3	46.8	31 6.65	+ 1.65	. .	−35.49	20 30 32.81	+ 0.20
	11	α Cygni	F.	30.5	34.0	36.1	44.8	47.7	50.7	59.2	1.3	5.0	37 47.70	− 0.02	−35.48	−35.49	20 37 12.19	+ 0.01
	12	B. A. C. 7204 . .	F.	32.4	35.5	37.3	44.7	47.2	49.6	56.9	58.7	1.9	41 47.13	− 0.28	. .	−35.51	20 41 11.34	− 2.20
	13	μ Aquarii . . .	F.	21.8	24.3	25.7	32.0	34.0	36.0	42.3	43.8	46.5	46 34.04	− 0.88	−35.49	−35.50	20 45 57.66	+ 0.06
Oct. 1	14	α Leonis	E.	10.6	13.3	14.9	21.1	23.2	25.3	31.5	33.0	35.7	2 23.18	− 0.60	−38.42	−38.39	10 1 44.19	− 0.01
	15	γ¹ Leonis	E.	32.0	34.7	36.4	42.7	45.0	47.3	53.8	55.4	58.2	13 45.06	− 0.49	−38.44	−38.40	10 13 6.17	+ 0.02
	16	δ Leonis	E.	54.5	57.2	58.9	5.5	7.7	9.9	16.5	18.0	20.9	8 7.68	− 0.48	−38.47	−38.45	11 7 28.75	− 0.04
	17	β Leonis	E.	8.5	11.0	12.6	19.0	21.0	23.1	29.5	31.3	33.9	43 21.10	− 0.57	−38.53	−38.48	11 42 42.05	+ 0.03
2	18	Sun I, S. . . .	E.	44.0	46.7	48.3	54.4	56.4	58.5	4.5	6.1	8.7	32 56.40	− 0.82	. .	−38.54	12 32 17.04	. .
	19	Sun II, N. . . .	E.	53.0	55.4	57.0	3.0	5.3	7.2	13.4	15.0	17.6	35 5.21	− 0.82	. .	−38.54	12 34 25.85	. .
	20	12 Canum Venat. .	E.	34.5	37.7	39.6	47.6	50.3	53.0	0.7	2.6	6.0	50 50.22	− 0.14	−38.55	−38.54	12 50 11.54	+ 0.01
	21	Polaris, S. P. . .	E.	47.0	41.5	48.5	22.0	57.0	31.0	4.5	11.1	7.0	14 56.61	−36.54	. .	−38.55	1 13 41.52	+ 0.06
	22	Mercury I, S. . .	E.	23.4	25.9	27.4	34.0	36.1	38.3	44.7	46.4	49.0	4 36.13	− 0.98	. .	−38.62	14 3 56.53	+ 0.23
	23	α Bootis	E.	24.6	27.3	28.9	35.5	37.6	39.7	46.3	47.9	50.6	10 37.60	− 0.50	−38.62	−38.60	14 9 58.50	+ 0.02
	24	ε Bootis	E.	57.7	0.5	2.2	9.1	11.4	13.9	20.8	22.5	25.4	40 11.50	− 0.37	−38.59	−38.62	14 39 32.51	− 0.05
	25	α Coronæ Borealis .	E.	. .	. .	59.2	1.5	3.7	6.0	8.3	. .	. .	30 3.74	− 0.38	−38.68	−38.67	15 29 24.69	+ 0.01
	26	α Serpentis . . .	E.	34.9	37.5	39.0	45.2	47.3	49.4	55.6	57.0	59.6	38 47.28	− 0.68	−38.69	−38.67	15 38 7.93	+ 0.04
	27	ε Serpentis . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	28	δ Scorpii	E.	24.7	27.5	29.0	35.7	37.9	40.0	46.7	48.3	51.3	53 37.90	− 1.08	−38.72	−38.69	15 52 58.13	+ 0.04
	29	γ Draconis . . .	E.	1.7	5.9	8.2	18.1	21.4	24.6	34.6	37.0	41.2	54 21.41	+ 0.30	. .	−38.76	17 53 42.95	0.00
	30	γ² Sagittarii . . .	E.	. .	. .	24.3	26.7	29.0	31.4	33.9	. .	. .	58 29.06	− 1.21	−38.71	−38.76	17 57 49.09	− 0.04
	31	μ¹ Sagittarii . . .	E.	46.5	49.0	50.7	57.3	59.5	1.7	8.2	9.8	12.5	6 59.47	− 1.04	−38.76	−38.79	18 6 19.54	− 0.03
	32	δ Ursæ Minoris. .	E.	20.5	3.5	30.0	39.5	13.5	49.0	. .	. .	. .	12 48.22	+13.75	. .	−38.80	18 12 23.17	+ 0.46
	33	η Serpentis . . .	E.	19.9	22.5	24.0	30.0	32.1	34.2	40.4	41.9	44.5	15 32.17	− 0.79	−38.87	−38.80	18 14 52.58	+ 0.13
	34	B. A. C. 6246 . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	35	1 Aquilæ. . . .	E.	53.9	56.4	58.0	4.0	6.1	8.3	14.5	16.0	18.6	29 6.20	− 0.86	−38.83	−38.82	18 28 26.52	+ 0.08
	36	α Lyræ	E.	6.8	10.0	12.0	20.0	22.6	25.2	32.9	34.9	38.4	33 22.53	− 0.08	−38.78	−38.82	18 32 43.63	− 0.02
	37	51 Cephei, S. P. . .	E.	. .	. .	. .	. .	. .	10.5	46.5	14.3	21.5	42 35.40	−18.58	. .	−38.83	6 41 37.99	+ 0.38
	38	B. A. C. 6397 . .	E.	. .	. .	6.8	9.0	11.2	13.3	15.5	. .	. .	42 11.16	− 0.48	. .	−38.81	18 41 31.87	− 1.81
	39	B. A. C. 6426 . .	E.	35.9	37.7	42.5	45.0	47.4	49.9	52.3	57.0	58.9	45 47.40	− 0.22	. .	−38.81	18 45 8.37	− 1.50
	40	ζ Aquilæ (R.) . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	41	d Sagittarii . . .	E.	51.6	53.0	57.5	59.7	1.9	4.0	6.2	10.5	12.1	11 1.83	− 1.02	−38.90	−38.85	19 10 21.96	+ 0.07
	42	Mars I, S. . . .	E.	32.0	34.7	36.3	. .	. .	. .	54.4	56.1	58.8	14 45.38	− 1.12	. .	−38.83	19 14 5.43	+ 0.59
	43	Mars II, N. . .	E.	. .	. .	42.0	44.1	46.3	48.6	50.9	. .	. .	14 46.38	− 1.12	. .	−38.83	19 14 6.43	− 0.41
	44	Mural Zones 119, 60	E.	8.2	11.0	12.8	19.8	22.3	24.6	31.4	33.0	36.0	31 22.12	− 1.16	. .	−38.84	19 30 42.12	− 3.02
	45	O. Arg. S. 19809 .	E.	41.8	44.6	46.5	53.2	55.6	58.0	4.9	6.6	9.6	31 55.64	− 1.16	. .	−38.84	19 31 15.64	− 3.02
	46	α Aquilæ (R.) . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	47	α Aquilæ	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	B. A. C. 6849 . .	E.	. .	. .	59.1	1.7	4.4	7.0	9.5	. .	. .	52 4.34	− 0.09	. .	−38.85	19 51 25.40	− 1.74
	49	B. A. C. 6857 . .	E.	18.0	21.4	23.3	31.3	34.0	36.7	44.7	46.7	50.0	53 34.02	− 0.05	. .	−38.85	19 52 55.12	− 1.70

10, 21. Bisections at sets B and D.
23, 31. Telescope micrometer reading increased one revolution in reduction.
32. Bisections at wires B_1, C_1, and C_3.
37. Bisections at wires C_6 and D_3.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	66 18	10 2.6	28.1	9.8	4.6	35	800	840	. .	. .	. .	31.3	66 21 32.8	. .	+ 2 8.2	117 30 2.2	— 3.1
2	69 40	5.8	1.3	11.8	8.8	35	970	980	. .	. .	. .	31.3	69 43 27.2	. .	+ 2 31.6	120 52 20.0	— 4.1
3	72 8	1.8	27.0	8.0	4.6	34	. .	412	. .	464	. .	31.3	72 11 55.2	64.2	+ 2 54.0	123 21 10.4	— 4.4
4	75 10	9 28.5	24.3	5.5	1.0	30	. .	330	. .	362	. .	31.3	75 15 0.9	. .	+ 3 31.2	126 24 53.3	— 4.9
5	40 0	10 1.5	27.9	9.3	5.0	33	. .	308	. .	342	. .	31.3	40 4 11.9	. .	+ 47.5	91 11 20.6	— 6.7
6	51 44	2.4	28.3	9.5	2.6	33	. .	. .	. .	190	194	31.3	51 48 13.7	. .	+ 1 11.8	102 55 46.7	+ 0.5
7	76 34	5.2	1.5	12.0	7.5	33	. .	286	. .	360	. .	31.3	76 38 8.5	. .	+ 3 53.3	127 48 23.0	— 3.8
8	74 46	4.2	29.0	9.9	7.1	31	. .	. .	. .	604	606	31.3	74 50 36.6	. .	+ 3 25.6	126 0 23.4	— 3.1
9	27 56	5.4	2.0	13.5	8.2	33	. .	. .	. .	. .	170	31.3	28 0 11.0	. .	+ 30.1	79 7 2.3	+ 1.4
10	326 44	2.6	29.0	9.8	5.6	35	. .	. .	. .	990	986	31.3	326 47 30.6	. .	— 37.1	17 53 14.7	+ 2.7
11	354 0	7.1	4.6	15.6	10.2	36	142	138	. .	158	190	31.3	354 3 23.2	. .	— 5.9	45 9 38.5	+ 1.0
12	5 20	0.4	28.2	9.6	4.1	37	. .	. .	. .	704	720	31.3	5 23 5.8	. .	+ 5.3	56 29 32.3	+17.0
13	48 16	3.4	1.2	12.0	5.6	35	. .	. .	. .	844	852	31.3	48 19 31.1	62.5	+ 1 3.6	99 26 55.9	+ 1.2
14	26 14	2.0	2.7	15.0	8.5	31	. .	730	. .	740	. .	31.2	26 18 32.6	. .	+ 28.8	77 25 22.6	— 0.1
15	18 20	3.0	2.0	15.8	8.2	29	. .	915	. .	950	. .	31.2	18 25 0.0	55.0	+ 19.4	69 31 40.6	+ 0.1
16	17 36	9 26.6	26.3	10.5	3.0	30	. .	520	. .	530	. .	31.2	17 40 56.6	. .	+ 18.5	68 47 36.3	+ 0.2
17	23 32	28.5	27.6	11.6	6.0	29	. .	775	. .	765	. .	31.2	23 37 6.3	. .	+ 25.3	74 43 52.8	+ 1.9
18	42 40	10 2.9	27.1	10.7	5.8	30	250	180	. .	. .	. .	31.2	42 44 58.8	59.5	+ 53.3	93 52 13.3	. .
19	42 8	9 26.6	22.9	6.6	2.8	30	. .	. .	. .	745	755	31.2	42 12 54.7	. .	+ 52.3	93 20 8.2	. .
20	359 50	29.2	28.0	12.2	8.0	33	. .	380	. .	370	. .	31.2	359 54 10.3	. .	— 0.1	41 0 31.4	+ 1.0
21	307 30	10 2.0	1.0	14.0	10.8	34	975	. .	980	. .	965	31.2	307 33 40.8	. .	— 1 14.9	358 38 47.1	— 0.3
22	54 4	9 23.2	20.8	5.6	0.5	35	. .	295	. .	275	. .	31.2	54 7 47.6	. .	+ 1 19.6	105 15 28.4	. .
23	19 0	10 3.1	1.9	16.5	9.3	35	. .	000	. .	060	. .	31.2	19 3 26.2	. .	+ 19.9	70 10 7.3	+ 3.0
24	11 14	9 29.0	28.2	12.2	4.5	36	. .	285	. .	320	. .	31.2	11 17 26.3	. .	+ 11.5	62 23 59.0	+ 2.4
25	11 42	10 6.0	4.7	18.5	10.8	36	. .	210	. .	290	. .	31.2	11 45 20.6	. .	+ 12.0	62 51 53.8	+ 3.2
26	32 0	5.8	3.3	17.6	10.2	33	. .	790	. .	820	. .	31.2	32 3 58.6	. .	+ 36.0	83 10 55.8	+ 3.6
27	33 58	9 28.2	26.5	11.1	3.1	34	. .	. .	. .	825	885	31.2	34 1 49.9	61.0	+ 38.9	85 8 50.0	+ 3.8
28	61 4	29.3	27.0	11.3	5.5	33	. .	980	. .	050	. .	31.2	61 8 1.2	. .	+ 1 44.1	112 16 6.5	+ 4.4
29	347 20	10 5.0	2.2	13.8	9.1	35	. .	925	. .	965	. .	32.0	347 23 28.8	. .	— 13.0	38 29 37.0	+ 1.9
30	69 12	1.7	28.2	10.5	5.0	31	. .	365	. .	385	. .	32.0	69 16 41.8	. .	+ 2 32.2	120 25 35.2	— 0.8
31	59 54	1.0	29.7	11.5	5.7	35	. .	040	. .	070	. .	32.0	59 57 29.6	. .	+ 1 40.0	111 5 30.8	+ 1.4
32	312 14	9 29.5	28.0	10.7	5.7	33	880	. .	745	. .	765	32.0	312 18 5.8	. .	— 1 3.8	3 23 23.2	+ 1.0
33	41 44	10 4.5	2.0	15.3	7.8	31	. .	420	. .	460	. .	32.0	41 48 37.4	. .	+ 51.9	92 55 50.8	+ 3.9
34	347 32	0.0	26.5	8.5	3.4	33	. .	. .	. .	975	000	32.0	347 36 4.8	57.0	— 12.8	38 42 13.2	+11.1
35	47 8	9 29.1	27.8	10.0	8.3	32	. .	390	. .	460	. .	32.0	47 12 26.1	. .	+ 1 2.7	98 19 50.0	+ 2.0
36	0 10	10 7.8	6.3	17.0	12.0	36	. .	065	. .	075	. .	32.0	0 13 23.5	. .	+ 0.2	51 19 44.9	+ 2.3
37	306 6	0.8	27.7	10.5	5.5	38	. .	. .	. .	520	430	32.0	306 8 52.7	. .	— 1 19.5	357 13 54.4	+ 1.4
38	20 46	4.0	1.5	13.8	5.7	31	. .	. .	. .	820	850	32.0	20 50 33.1	. .	+ 22.2	71 57 16.5	+ 6.6
39	6 10	3.3	2.7	14.4	8.8	37	. .	. .	. .	040	065	32.0	6 13 12.3	. .	+ 6.3	57 19 39.8	+10.3
40	154 44	1.1	29.0	11.1	6.7	35	. .	. .	. .	470	340	32.0	154 47 39.9	. .	— 27.4	76 19 8.7	+ 1.3
41	57 58	9 28.8	25.2	8.7	2.8	32	. .	005	. .	035	. .	32.0	58 2 34.5	. .	+ 1 33.2	109 10 28.9	+ 4.9
42	64 10	10 5.8	3.9	16.5	10.8	34	325	. .	. .	. .	395	32.0	64 13 50.6	. .	+ 2 0.1	115 22 11.9	. .
43	64 10	5.8	3.9	16.5	10.8	35	. .	315	. .	320	. .	32.0	64 13 36.1	. .	+ 2 0.1	115 21 57.4	. .
44	66 26	0.3	26.5	9.5	2.5	35	025	015	. .	. .	. .	32.0	66 29 47.3	. .	+ 2 13.4	117 38 21.9	— 4.8
45	66 26	0.3	26.5	9.5	2.5	31	. .	. .	. .	930	810	32.0	66 30 36.2	. .	+ 2 13.5	117 39 10.9	— 4.8
46	149 36	1.3	29.0	12.0	7.5	36	170	205	. .	. .	. .	32.0	149 39 26.8	. .	— 34.2	81 27 28.6	+ 0.6
47	30 16	1.5	29.5	11.5	4.8	31	. .	. .	. .	785	755	32.0	30 20 35.2	. .	+ 34.2	81 27 30.6	+ 2.6
48	0 40	2.8	1.1	13.4	6.2	33	665	640	. .	. .	. .	32.0	0 44 5.2	. .	+ 0.8	51 50 27.2	+15.4
49	358 48	9 29.3	28.6	11.3	3.3	36	. .	215	. .	280	. .	32.0	358 51 28.4	. .	— 1.2	49 57 48.4	+15.8

No.	Barom.	At. Ther.
	in.	°
3	29.94	65.5
13	29.93	64.5
15	30.28	55.0
18	30.29	59.0
27	30.30	62.0
34	30.33	58.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
18	— 6.0	— 16 2.5	. .	— 16 8.5
19	— 5.9	+ 16 2.5	. .	+ 15 56.6
22	— 6.7	— 3.2	. .	— 9.9
42	— 9.5	— 7.3	. .	— 16.8
43	— 9.5	+ 7.2	. .	— 2.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Oct. 2	1	Saturn I, S. . .	E.	5.4	8.0	9.6	. .	. .	. .	26.7	28.2	30.8	31 18.12	− 0.98	. .	−38.92	21 30 38.22	. .
	2	Saturn II, N. . .	E.	. .	. .	15.1	17.2	19.2	21.6	23.6	. .	. .	31 19.34	− 0.98	. .	−38.92	21 30 39.44	. .
	3	Anonymous . .	E.	53.8	56.5	58.3	4.4	6.6	8.8	15.3	16.7	19.7	0 6.68	− 1.00	. .	−38.94	21 59 26.74	− 3.46
	4	B. A. C. 7714 . .	E.	18.7	21.8	23.7	30.8	33.3	35.7	43.2	45.0	47.9	3 33.34	− 1.26	. .	−38.94	22 2 53.14	− 3.95
	5	B. A. C. 8002 . .	E.	15.4	18.6	20.0	27.3	29.6	32.0	38.8	40.6	43.5	53 29.53	− 1.21	. .	−38.97	22 52 49.35	− 3.94
	6	B. A. C. 8032 . .	E.	11.4	14.3	16.0	23.0	25.3	27.6	34.5	36.2	39.0	58 25.26	− 0.32	. .	−38.97	22 57 45.97	− 2.96
	7	Weisse 103 . .	E.	3.8	6.5	8.0	. .	. .	. .	24.7	26.0	28.4	8 16.23	− 0.88	. .	−38.98	23 7 36.37	− 3.44
	8	Weisse 104 . .	E.	. .	. .	12.1	14.2	16.3	18.3	20.5	. .	. .	8 16.28	− 0.88	. .	−38.98	23 7 36.42	− 3.44
	9	Weisse 109 . .	E.	. .	. .	. .	. .	. .	. .	33.0	34.6	37.3	8 24.77	− 0.88	. .	−38.98	23 7 44.91	− 3.44
	10	θ Piscium . . .	E.	8.3	10.8	12.5	18.5	20.6	22.7	28.9	30.5	32.9	22 20.63	− 0.67	−39.04	−39.05	23 21 40.91	+ 0.05
	11	λ Draconis, S. P. .	E.	16.6	9.2	4.5	46.8	40.9	35.3	16.9	12.6	5.0	24 40.87	− 3.17	. .	−39.05	11 23 58.65	+ 0.28
	12	ι Piscium . . .	E.	2.0	4.6	6.0	12.2	14.3	16.3	22.6	24.0	26.7	34 14.30	− 0.68	−39.00	−39.06	23 33 34.56	− 0.06
	13	Eurydice . . .	E.	20.5	23.2	24.8	30.8	33.0	35.0	41.0	42.6	45.3	42 32.91	− 0.77	. .	−39.01	23 41 53.13	. .
	14	Metis	E.	48.9	51.5	53.0	59.3	1.4	3.4	9.6	11.2	13.8	53 1.34	− 0.90	. .	−39.02	23 52 21.42	. .
	15	Concordia . . .	E.	6.0	8.5	10.5	16.5	18.6	20.6	27.0	28.6	31.1	56 18.60	− 0.79	. .	−39.02	23 55 38.79	. .
	16	α Andromedæ . .	E.	24.5	27.2	28.8	35.9	38.1	40.5	47.6	49.1	52.2	2 38.21	− 0.30	−38.95	−39.08	0 1 58.83	− 0.11
4	17	Victoria . . .	P.	49.5	52.0	53.8	0.0	2.2	4.0	10.6	12.1	14.5	6 2.08	− 0.57	. .	−41.50	0 5 20.01	. .
	18	α Cassiopeæ (R.) .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	19	α Cassiopeæ . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	20	β Ceti.	P.	. .	0.8	2.8	5.0	7.2	9.4	13.7	16.3	17.9	38 5.04	− 1.02	−41.52	−41.53	0 37 22.49	+ 0.04
	21	Echo	P.	44.8	46.7	50.5	52.7	54.5	56.7	58.7	2.8	4.2	48 54.62	− 0.69	. .	−41.54	0 48 12.39	. .
	22	ε Piscium . . .	P.	0.7	3.2	4.8	11.0	12.9	15.0	21.2	22.8	25.4	57 13.00	− 0.66	−41.53	−41.55	0 56 30.79	0.00
	23	Polaris (R.) . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	24	Polaris	P.	. .	. .	. .	. .	. .	15.0	41.5	. .	. .	13 48.08	+35.23	. .	−41.58	1 13 41.73	− 0.52
	25	θ^1 Ceti. . . .	P.	20.2	22.5	24.2	30.4	32.5	34.6	40.7	42.3	44.8	18 32.47	− 0.88	−41.58	−41.58	1 17 50.01	+ 0.02
	26	B. A. C. 528 . .	P.	6.8	9.0	14.0	16.6	19.0	21.8	24.4	29.4	31.4	37 19.16	− 1.35	. .	−41.58	1 36 36.23	− 3.85
	27	ο Piscium . . .	P.	20.9	23.6	25.0	31.3	33.3	35.3	41.5	43.0	45.7	39 33.29	− 0.65	−41.58	−41.59	1 38 51.05	− 0.04
	28	β Arietis (R.) . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	29	β Arietis	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	30	α Arietis	P.	40.0	42.8	44.4	51.0	53.3	55.5	2.0	3.8	6.6	0 53.27	− 0.44	−41.60	−41.60	2 0 11.23	+ 0.01
	31	Neptune . . .	P.	6.5	9.0	10.6	17.0	19.0	21.0	27.5	28.8	31.4	3 18.98	− 0.61	. .	−41.61	2 2 36.76	. .
	32	ρ^2 Arietis	P.	19.8	22.3	24.0	30.5	32.6	34.8	41.1	42.8	45.5	49 32.60	− 0.50	. .	−41.65	2 48 50.45	− 3.35
	33	α Ceti (R) . . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	34	α Ceti.	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	35	B. A. C. 984 . .	P.	16.8	20.0	21.9	29.5	32.0	34.4	42.0	43.9	47.0	4 31.94	− 1.32	. .	−41.67	3 3 48.95	− 3.28
	36	ζ Arietis	P.	15.6	18.2	19.9	26.4	28.5	30.8	37.3	38.9	41.7	8 28.59	− 0.46	−41.67	−41.67	3 7 46.46	− 0.04
	37	γ^2 Ursæ Minoris, S. P.	P.	19.5	11.2	5.9	. .	. .	. .	12.5	7.2	58.7	21 39.17	− 3.50	. .	−41.68	15 20 53.99	− 0.41
	38	B. A. C. 1100 . .	P.	35.8	38.4	39.9	46.1	48.2	50.3	56.5	58.0	0.6	27 48.20	− 0.90	. .	−41.68	3 27 5.62	− 3.08
	39	δ Persei	P.	29.4	33.1	35.5	44.5	47.5	50.5	59.7	1.8	5.6	34 47.51	+ 0.13	. .	−41.69	3 34 5.95	+ 0.21
	40	η Tauri	P.	35.5	38.1	39.9	46.4	48.7	51.0	57.7	59.4	2.3	40 48.78	− 0.40	−41.67	−41.70	3 40 6.68	− 0.03
	41	ζ Persei	P.	47.7	50.6	52.3	59.7	2.1	4.5	11.7	13.4	16.6	47 2.07	− 0.26	−41.69	−41.70	3 46 20.11	− 0.02
	42	γ^1 Eridani. . . .	P.	45.0	47.7	49.1	55.5	57.6	59.7	6.0	7.4	10.2	52 57.57	− 0.95	−41.76	−41.71	3 52 14.91	+ 0.09
	43	Groom. 2320, S.P. .	P.	15.4	8.8	4.6	48.0	42.4	36.8	20.5	16.6	9.6	6 42.52	− 2.96	. .	−41.72	16 5 57.84	+ 0.09
	44	B. A. C. 1341 . .	P.	30.4	33.3	35.0	41.8	44.0	46.3	53.0	54.8	57.5	15 44.01	− 0.38	. .	−41.73	4 15 1.90	− 3.29
	45	62^2 Tauri	P.	59.7	2.5	4.1	10.8	13.0	15.3	21.9	23.6	26.5	17 13.04	− 0.40	. .	−41.73	4 16 30.91	− 3.26
	46	α Tauri (R.) . . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	47	α Tauri	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	9 Camelopardalis (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	49	9 Camelopardalis .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .

3, 13, 14, 15, 17, 21. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	55 2	9 28.8	26.7	9.8	3.3	34	385	. .	. .	. .	420	32.0	55 5 57.2	. .	+ 1 24.2	106 13 42.6	. .
2	55 2	28.8	26.7	9.8	3.3	35	. .	585	. .	600	. .	32.0	55 5 38.4	. .	+ 1 24.2	106 13 23.8	. .
3	56 18	10 1.0	28.2	11.0	5.0	34	. .	600	. .	660	. .	32.0	56 24 25.0	. .	+ 1 28.7	107 32 14.9	+11.2
4	71 56	5.2	1.2	14.5	8.3	32	. .	970	. .	095	. .	32.0	72 0 13.0	. .	+ 3 0.0	123 9 34.2	+ 7.7
5	68 54	9 27.3	24.2	8.8	2.4	31	. .	270	. .	225	. .	32.0	68 58 47.0	. .	+ 2 32.9	120 7 41.1	+13.2
6	11 26	10 5.0	2.3	14.8	8.5	38	. .	540	. .	540	. .	32.0	11 28 48.7	. .	+ 12.0	62 35 21.9	+21.8
7	48 24	0.3	28.2	10.5	4.7	32	150	240	. .	. .	. .	32.0	48 28 29.5	. .	+ 1 6.8	99 35 57.5	+18.1
8	48 24	0.3	38.2	10.5	4.7	30	500	620	. .	. .	. .	32.0	48 28 54.5	. .	+ 1 6.8	99 36 22.5	+18.1
9	48 24	0.3	38.2	10.5	4.7	28	. .	. .	. .	. .	915	32.0	48 29 20.4	. .	+ 1 6.8	99 36 48.4	+18.1
10	33 8	2.8	0.0	13.5	7.7	37	. .	360	. .	420	. .	32.0	33 11 7.8	. .	+ 38.8	84 18 7.8	+ 3.2
11	288 54	1.5	28.3	10.0	5.4	35	. .	960	. .	970	. .	32.0	288 57 30.9	. .	− 2 50.9	340 1 1.2	+ 3.6
12	33 52	2.8	0.0	11.7	7.4	35	. .	010	. .	140	. .	32.0	33 55 43.8	. .	+ 39.9	85 2 44.9	+ 2.7
13	40 10	7.3	4.5	16.8	11.3	32	. .	270	. .	360	. .	32.0	40 16 54.4	. .	+ 50.2	91 24 5.8	− 6.2
14	49 34	2.5	0.1	13.3	7.5	33	. .	870	. .	890	. .	32.0	49 40 34.5	. .	+ 1 9.8	100 48 5.5	− 5.2
15	42 14	0.0	26.2	10.0	3.2	39	. .	500	. .	410	. .	32.0	42 19 12.7	. .	+ 54.0	93 26 27.9	− 3.2
16	10 26	5.0	3.0	15.2	10.2	37	. .	365	. .	355	. .	32.0	10 29 6.1	. .	+ 11.0	61 35 38.3	+ 2.5
17	25 14	4.8	1.5	13.0	7.5	31	. .	. .	. .	220	270	30.7	25 21 13.2	47.5	+ 27.4	76 28 1.8	− 3.5
18	196 54	2.9	0.3	9.8	4.5	35	765	810	. .	. .	. .	30.7	196 57 31.5	. .	+ 17.6	34 8 32.1	− 2.0
19	342 58	2.0	29.2	9.8	5.1	31	. .	. .	. .	980	010	30.7	343 2 32.2	. .	− 17.6	34 8 35.8	+ 1.7
20	57 28	3.8	1.0	12.2	7.0	33	. .	. .	. .	310	290	30.7	57 32 9.2	. .	+ 1 30.7	108 40 1.1	+ 1.2
21	33 40	3.8	0.3	10.9	6.7	38	. .	570	. .	600	. .	30.7	33 45 21.7	. .	+ 38.7	84 52 21.6	− 3.8
22	31 36	9 29.6	26.7	7.8	2.6	35	535	510	. .	555	550	30.7	31 39 39.2	. .	+ 35.7	82 46 36.1	+ 0.4
23	229 40	10 2.4	28.0	9.6	5.0	33	. .	890	920	. .	. .	30.7	229 44 2.0	. .	+ 1 8.2	1 21 11.0	− 0.6
24	310 12	2.4	29.9	9.1	5.0	34	. .	. .	. .	090	110	30.7	310 15 59.0	. .	− 1 8.2	1 21 12.0	+ 0.4
25	47 38	0.3	27.2	7.5	3.1	34	. .	. .	. .	425	440	30.7	47 41 56.0	. .	+ 1 3.5	98 49 20.7	+ 2.2
26	76 14	4.5	0.1	9.6	6.2	37	170	155	. .	. .	. .	30.7	76 17 10.1	. .	+ 3 52.8	127 27 24.1	+25.4
27	30 18	2.6	0.0	10.1	5.8	37	800	810	. .	850	890	30.7	30 21 1.0	. .	+ 33.9	81 27 56.1	+ 0.5
28	161 14	0.9	28.5	8.5	5.3	30	760	770	. .	. .	. .	30.7	161 18 50.1	. .	− 19.6	69 47 50.7	+ 0.4
29	18 38	0.3	28.0	10.0	3.2	37	. .	. . .	. .	335	345	30.7	18 41 10.8	. .	+ 19.6	69 47 51.6	+ 1.3
30	15 58	9 29.9	28.1	9.1	2.8	38	805	785	. .	830	835	30.7	16 0 48.4	. .	+ 16.6	67 7 26.2	+ 2.2
31	28 16	10 0.4	28.5	7.7	4.6	31	. .	340	. .	375	. .	30.7	28 20 42.1	53.2	+ 31.2	79 27 34.5	. .
32	21 0	2.1	0.1	11.8	4.9	35	950	938	. .	. .	. .	30.7	21 3 29.7	. .	+ 22.3	72 10 13.2	+21.6
33	144 40	2.7	0.2	10.3	7.3	36	305	335	. .	. .	. .	30.7	144 43 24.3	. .	− 41.0	86 23 37.9	− 5.1
34	35 12	2.2	28.3	9.5	4.5	31	. .	. .	. .	295	275	30.7	35 16 42.7	. .	+ 41.0	86 23 44.9	+ 1.9
35	74 40	3.4	0.2	10.3	6.3	33	390	410	. .	. .	. .	50.7	74 44 7.8	. .	+ 3 28.9	125 53 57.9	+29.2
36	18 14	0.6	29.0	10.3	4.4	33	225	210	. .	235	260	30.7	18 18 12.7	. .	+ 19.2	69 24 53.1	+ 1.6
37	291 8	0.5	28.3	7.4	3.5	30	. .	890	. .	925	. .	30.7	291 12 48.2	. .	− 2 28.1	342 16 41.3	+ 0.1
38	48 42	3.2	29.7	10.5	6.1	37	. .	. .	. .	620	635	30.7	48 45 4.2	. .	+ 1 6.0	99 52 31.4	+26.1
39	351 26	9 28.8	27.2	7.8	3.2	32	. .	445	. .	480	. .	30.7	351 30 26.5	. .	− 8.7	42 36 39.0	− 0.6
40	15 6	10 5.2	3.5	13.2	8.3	33	. .	485	. .	535	. .	30.7	15 10 4.5	. .	+ 15.7	66 16 41.4	+ 0.4
41	7 18	2.1	29.5	10.7	6.6	31	515	450	. .	540	570	30.7	7 22 38.0	. .	+ 7.5	58 29 6.7	+ 0.2
42	52 40	0.8	26.9	7.9	3.6	34	610	635	. .	640	685	30.7	52 43 52.1	52.9	+ 1 16.0	103 51 29.3	+ 1.1
43	287 2	4.8	1.6	12.1	8.3	36	990	020	. .	190	180	30.7	287 5 8.9	. .	− 3 6.2	338 8 23.9	+ 0.4
44	13 30	7.1	4.7	16.1	10.6	36	780	795	. .	. .	. .	30.7	13 33 12.0	. .	+ 14.0	64 39 47.2	+15.7
45	14 48	4.1	2.0	13.3	7.9	31	. .	. .	. .	290	295	30.7	14 52 39.6	. .	+ 15.4	65 59 16.2	+16.0
46	157 18	2.4	28.9	9.6	5.9	32	330	350	. .	. .	. .	30.7	157 22 25.1	. .	− 24.2	73 44 20.3	+ 0.8
47	22 34	1.9	0.0	10.7	5.2	35	. .	. .	. .	590	615	30.7	22 37 35.8	. .	+ 24.2	73 44 21.2	+ 1.7
48	207 10	6.7	5.0	13.4	7.9	35	. .	. .	645	. .	. .	30.7	207 13 30.9	. .	+ 29.8	23 52 20.5	+ 0.1
49	332 42	0.3	26.7	6.9	5.2	32	. .	. .	. .	300	322	30.7	332 46 29.5	52.5	− 29.8	23 52 20.9	+ 0.5

No.	Barom.	At. Ther.
	in.	°
17	30.40	50.0
32	30.01	55.6
42	29.995	54.8
49	30.00	54.5

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	″	′ ″	′ ″	′ ″
1	− 0.8	− 9.4	. .	− 10.2
2	− 0.8	+ 9.4	. .	+ 8.6
31	− 0.1	. .	. .	− 0.1

For summary of the elements of reduction see page 3.

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Oct. 4	1	δ Leonis	Sk.	58.3	0.9	2.6	9.2	11.4	13.6	20.0	21.7	24.5	8 11.36	− 0.38	−42.20	−42.16	11 7 28.82	− 0.02
	2	β Leonis	Sk.	12.1	14.7	20.6	22.6	24.8	26.8	29.0	35.0	37.5	43 24.79	− 0.48	−42.27	−42.19	11 42 42.12	+ 0.06
	3	γ Ursæ Majoris	Sk.	. .	. .	50.6	54.2	57.7	1.1	4.8	. .	. .	47 57.68	+ 0.56	. .	−42.19	11 47 16.05	+ 0.15
5	4	Sun I, N.	Sk.	42.6	45.0	46.6	52.7	54.8	56.9	2.9	4.5	7.0	43 54.78	− 0.79	. .	−42.30	12 43 11.69	. .
	5	Sun II, S.	Sk.	51.5	54.0	55.5	1.8	3.7	5.8	11.9	13.4	16.1	46 3.74	− 0.79	. .	−42.30	12 45 20.65	. .
	6	Polaris, S. P.	Sk.	43.5	. .	. .	. .	. .	. .	. .	. .	. .	15 4.14	−41.61	. .	−42.26	1 13 40.27	− 2.10
	7	Moon I, N.	Sk.	44.8	47.8	49.5	56.9	59.2	1.6	8.9	10.6	13.7	26 59.22	− 1.20	. .	−42 50	17 26 15.52	+69.80
	8	μ Herculis	Sk.	4.3	7.0	8.8	15.8	18.0	20.3	27.2	29.0	31.9	42 18.03	− 0.30	−42.48	−42.49	17 41 35.24	− 0.01
	9	γ^2 Sagittarii	Sk.	18.6	21.6	23.4	30.5	32.8	35.1	42.2	44.0	47.0	58 32.80	− 1.23	−42.48	−42.51	17 57 49.06	− 0.02
	10	α Lyræ	Sk.	10.7	13.9	15.8	23.6	26.2	28.7	36.8	38.6	42.0	33 26.26	− 0.05	−42.61	−42.54	18 32 43.67	+ 0.09
	11	B. A. C. 6397	Sk.	2.0	4.7	6.3	12.6	14.8	17.0	23.4	25.0	27.7	42 14.83	− 0.47	. .	−42.54	18 41 31.82	− 1.75
	12	B. A. C. 6426	Sk.	36.5	39.5	41.4	48.6	50.9	53.4	0.7	2.5	5.5	45 51.00	− 0.20	. .	−42.54	18 45 8.26	− 1.43
	13	δ Draconis (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	14	δ Draconis	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	15	λ Ursæ Minoris	Sk.	30.0	47.0	14.0	. .	. .	. .	. .	. .	. .	48 31.08	+49.03	. .	−42.60	19 48 37.51	− 1.76
	16	α Aquilæ	Sk.	14.3	16.8	18.3	24.4	26.5	28.6	34.8	36.3	38.8	45 26.53	− 0.62	−42.54	−42.60	19 44 43.31	− 0.02
	17	B. A. C. 6849	Sk.	52.6	55.8	57.8	5.6	8.1	10.7	18.5	20.4	23.7	52 8.13	− 0.07	. .	−42.59	19 51 25.47	− 1.67
	18	B. A. C. 6860	Sk.	29.1	32.3	34.3	42 2	44.8	47.5	55.2	57.0	0.4	53 44.76	− 0.07	. .	−42.59	19 53 2.10	− 1.68
	19	ε Delphini	Sk.	47.7	50.3	51.8	58.0	0.1	2.2	8.5	9.9	12.4	28 0.10	− 0.59	−42.60	−42.64	20 27 16.87	+ 0.01
	20	α Cygni	Sk.	37.5	40.8	43.1	51.8	54.5	57.3	6.2	8.3	11.9	37 54.60	+ 0.12	−42.66	−42.64	20 37 12.08	+ 0.04
	21	B. A. C. 7212	Sk.	30.0	34.2	36.0	43.9	46.4	49.2	57.0	58.9	2.2	43 46.52	− 1.39	. .	−42.61	20 43 2.52	− 3.78
	22	B. A. C. 7234	Sk.	3.8	7.1	9.0	17.0	19.7	22.4	30.5	32.3	35.8	46 19.73	− 1.42	. .	−42.61	20 45 35.72	− 3.88
	23	Mural Zones 187, 66	Sk.	25.5	28.2	29.8	36.3	38.6	40.7	47.3	48.8	51.8	7 38.56	− 1.06	. .	−42.63	21 6 54.87	− 3.31
	24	O. Arg. S. 21237	Sk.	25.1	27.7	29.4	36.0	38.1	40.4	47.0	48.6	51.4	8 38.19	− 1.06	. .	−42.63	21 7 54.50	− 3.31
	25	β Aquarii	Sk.	33.0	35.6	37.2	43.3	45.3	47.4	53.5	55.0	57.6	25 45.32	− 0.84	−42.75	−42.68	21 25 1.80	+ 0.10
	26	ε Pegasi	Sk.	36.0	39.2	40.6	46.8	48.9	51.0	57.3	58.7	1.4	38 48.94	− 0.62	−42.67	−42.69	21 38 5.63	− 0.01
	27	α Aquarii (R)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	28	Mural Zones 207, 70	Sk.	10.4	12.8	14.7	. .	. .	. .	. .	33.6	36.2	11 23.23	− 1.00	. .	−42.66	22 10 39.57	− 3.45
	29	Mural Zones 207, 71	Sk.	. .	. .	24.0	26.0	28.1	30.3	32.5	. .	. .	11 28.18	− 1.00	. .	−42.66	22 10 44.52	− 3.45
	30	B. A. C. 7892	Sk.	6.7	9.4	11.4	18.7	21.2	23.7	30.7	32.6	35.5	30 21.10	− 1.27	. .	−42.67	22 29 37.16	− 3.96
	31	B. A. C. 7895	Sk.	57.3	0.3	1.9	9.1	11.4	13.9	21.2	23.0	26.0	34 11.57	− 1.24	. .	−42.68	22 33 27.65	− 3.93
	32	B. A. C. 7923	Sk.	40.6	43.5	45.0	52.3	54.6	56.9	4.0	5.7	8.6	37 54.58	− 0.26	. .	−42.68	22 37 11.64	− 2.83
	33	Eurydice	Sk.	25.7	28.2	29.9	35.9	38.0	40.3	46.5	48.0	50.4	40 38.10	− 0.77	. .	−42.72	23 39 54.61	. .
	34	Metis	Sk.	13.6	16.3	17.9	24.2	26.4	28.6	34.7	36.4	38.9	50 26.33	− 0.91	. .	−42.72	23 49 42.70	. .
	35	Concordia	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	36	Lalande 512	Sk.	34.5	37.0	38.5	44.6	46.6	48.6	54.6	56.3	58.7	19 46.60	− 0.73	. .	−42.74	0 19 3.13	− 3.39
	37	B. A. C. 118	Sk.	53.6	56.9	58.9	6.9	9.6	12.3	20.3	22.3	25.6	25 9.60	− 1.43	. .	−42.74	0 24 25.43	− 4.24
	38	β Ceti	Sk.	53.5	55.2	57.7	4.2	6.3	8.5	15.0	16.6	19.3	38 6.26	− 1.03	−42.72	−42.84	0 37 22.30	− 0.07
	39	Echo	Sk.	49.7	52.2	53.8	0.1	2.0	4.0	10.3	12.0	14.3	48 2.04	− 0.68	. .	−42.75	0 47 18.61	. .
	40	Weisse 982	Sk.	. .	50.3	51.8	55.8	57.9	59.9	2.0	4.0	. .	57 59.94	− 0.68	. .	−42.76	0 57 16.50	− 3.39
	41	B. A. C. 303	Sk.	1.2	2.8	6.7	8.9	11.0	13.0	15.0	19.2	20.8	59 10.96	− 0.68	. .	−42.76	0 58 27.52	− 3.39
	42	Polaris	Sk.	. .	. .	51.5	18.0	41.0	15.0	. .	. .	. .	13 44.77	+38.40	. .	−42.88	1 13 40.20	− 2.20
	43	θ^1 Ceti	Sk.	21.4	23.9	25.5	31.7	33.8	35.8	41.8	43.5	46.0	18 33.71	− 0.88	−42.81	−42.88	1 17 49.95	− 0.05
7	44	Sun I, S.	F.	2.3	5.0	6.6	12.9	14.9	16.9	23.2	24.7	27.3	51 14.87	− 0.74	. .	−44.44	12 50 29.60	. .
	45	Sun II, N.	F.	12.1	14.6	16.1	22.3	24.2	26.4	32.5	34.0	36.6	53 24.31	− 0.74	. .	−44.44	12 52 39.13	. .
	46	θ Bootis	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	47	α Coronæ Borealis	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	α Serpentis	F.	40.7	43.3	44.9	51.0	53.2	55.1	1.3	2.8	5.5	38 53.09	− 0.63	−44.60	−44.64	15 38 7.82	− 0.02
	49	ε Serpentis	F.	9.5	11.9	13.4	19.5	21.6	23.7	29.8	31.3	33.9	45 21.62	− 0.66	−44.60	−44.65	15 44 36.31	− 0.05

7, 15. Bisections at sets B and D.
18, 28, 33, 34, 35, 39, 41. Wire A used.
40. Bisections at wires II and III.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Correct'ons.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	17 36	10 0.6	0.4	12.8	4.0	30	. .	126	. .	180	. .	31.1	17 40 59.3	65.0	+ 18.0	68 47 38.5	+ 1.8
2	23 32	1.7	1.8	13.1	6.3	29	. .	438	. .	. .	. .	31.1	23 37 8.7	. .	+ 24.6	74 43 54.5	+ 3.2
3	344 26	9 26.1	25.5	6.5	1.2	31	. .	308	. .	340	. .	31.1	344 30 46.4	. .	— 15.6	35 36 52.0	+ 1.8
4	43 18	10 0.5	26.8	10.3	3.2	31	915	878	. .	. .	. .	31.1	43 22 34.4	. .	+ 52.5	94 29 48.1	. .
5	43 50	1.3	27.3	10.7	4.5	31	. .	. .	. .	752	690	31.1	43 54 36.0	74.3	+ 53.6	95 1 50.8	. .
6	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
7	67 44	4.8	2.2	12.5	7.0	36	230	. .	830	. .	090	30.5	67 47 26.1	. .	+ 2 15.5	118 56 2.8	. .
8	11 2	4.5	3.7	14.6	6.6	34	. .	882	. .	948	. .	30.5	11 5 43.0	73.4	+ 11.0	62 12 15.2	+ 3.1
9	69 12	6.5	3.7	11.7	8.3	30	. .	522	. .	630	. .	30.5	69 16 48.8	. .	+ 2 26.7	120 25 36.7	+ 0.8
10	0 10	5.4	2.8	10.7	6.8	36	. .	360	. .	326	. .	30.5	0 13 22.1	. .	+ 0.2	51 19 43.5	+ 0.8
11	20 46	3.2	0.8	10.8	3.4	31	. .	760	. .	790	. .	30.5	20 50 33.8	. .	+ 21.4	71 57 16.4	+ 6.5
12	6 10	4.5	3.3	11.7	6.3	37	. .	030	. .	060	. .	30.5	6 13 11.3	. .	+ 6.1	57 19 38.6	+10.2
13	208 28	6.3	3.3	12.6	6.3	31	040	170	. .	. .	. .	30.5	208 32 39.8	. .	+ 30.6	22 33 10.8	— 4.0
14	331 24	8.0	12.5	4.5	6.0	36	. .	. .	. .	120	120	30.5	331 27 25.6	. .	— 30.6	22 33 16.2	+ 1.4
15	309 54	7.4	5.7	11.3	8.4	31	420	250	. .	. .	. .	30.5	309 58 39.8	. .	— 1 7.4	1 3 53.6	+ 1.0
16	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
17	0 40	4.3	2.3	11.3	5.0	33	. .	680	. .	700	. .	30.5	0 44 3.4	. .	+ 0.7	51 50 25.3	+15.7
18	0 40	4.3	2.3	11.3	5.0	35	. .	926	. .	010	. .	30.5	0 46 1.4	. .	+ 0.8	51 52 23.4	+15.8
19	27 56	3.8	1.2	9.5	5.0	33	. .	220	. .	252	. .	30.5	28 0 11.0	63.2	+ 30.3	79 7 2.5	+ 1.9
20	354 0	3.7	3.3	11.2	5.0	36	. .	378	. .	382	. .	30.5	354 3 22.2	. .	— 5.9	45 9 37.5	+ 0.8
21	77 8	4.3	0.0	8.0	4.7	33	240	258	. .	. .	. .	30.5	77 12 10.6	. .	+ 4 5.2	128 22 37.0	— 2.2
22	79 2	6.5	9.8	2.7	6.2	35	. .	832	. .	820	. .	30.5	79 5 29.6	. .	+ 4 46.6	130 16 37.4	— 2.5
23	59 24	4.5	0.9	11.0	6.3	33	458	478	. .	. .	. .	30.5	59 28 6.1	. .	+ 1 36.4	110 36 3.7	+ 5.6
24	59 24	4.5	0.9	11.0	6.3	37	. .	050	. .	166	. .	30.5	59 27 10.8	. .	+ 1 36.4	110 35 8.4	+ 5.7
25	44 56	2.8	29.3	8.9	3.2	35	. .	028	. .	080	. .	30.5	44 59 44.4	. .	+ 57.1	96 7 2.7	+ 3.3
26	29 30	6.6	3.0	12.5	6.7	31	. .	178	. .	150	. .	30.5	29 34 40.4	. .	+ 32.5	80 41 34.1	+ 1.1
27	140 8	9 29.5	28.1	7.5	4.2	34	. .	. .	. .	814	850	30.5	140 11 49.4	. .	— 47.7	90 55 19.5	+ 0.6
28	55 26	10 2.0	0.0	8.5	4.3	37	. .	170	. .	240	. .	30.5	55 31 44.2	. .	+ 1 23.2	106 39 28.6	+12.2
29	55 26	2.0	0.0	8.5	4.3	40	. .	. .	. .	. .	866	30.5	55 28 15.5	. .	+ 1 23.1	106 35 59.8	+12.2
30	71 6	2.6	28.5	8.5	4.0	36	924	950	. .	. .	. .	30.5	71 9 15.1	. .	+ 2 46.4	122 18 22.7	+10.1
31	70 6	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
32	9 16	5.9	12.5	2.2	4.5	37	. .	596	. .	628	. .	30.5	9 19 2.8	. .	+ 9.4	60 25 33.4	+22.0
33	40 10	5.0	1.0	11.2	6.2	38	. .	320	. .	448	. .	30.5	40 15 24.1	. .	+ 48.7	91 22 34.0	— 6.1
34	49 44	4.4	2.0	11.2	6.0	38	. .	550	. .	630	. .	30.5	49 49 20.8	. .	+ 1 8.0	100 56 50.0	— 5.2
35	42 32	6.8	2.0	12.5	6.5	38	. .	. .	. .	230	. .	30.5	42 37 25.6	. .	+ 52.9	93 44 39.7	— 3.2
36	37 34	5.5	2.0	12.0	6.3	34	890	000	. .	. .	. .	30.5	37 37 42.9	. .	+ 44.4	88 44 48.5	+22.8
37	78 56	5.3	1.3	9.6	6.5	30	. .	. .	. .	048	110	30.5	79 0 58.4	. .	+ 4 47.9	130 12 7.5	+19.5
38	57 28	5.3	2.6	12.0	7.1	33	190	218	. .	. .	. .	30.5	57 32 9.1	. .	+ 1 30.3	108 40 0.6	+ 0.6
39	33 48	7.2	3.5	13.6	8.5	39	. .	532	. .	540	. .	30.5	33 53 4.1	. .	+ 38.7	85 0 4.0	— 3.8
40	34 16	3.0	29.5	10.5	4.5	38	844	906	. .	. .	. .	30.5	34 18 45.0	. .	+ 39.3	85 25 45.5	+23.9
41	33 48	6.0	11.4	0.1	4.0	38	. .	. .	. .	158	190	30.5	33 53 28.1	. .	+ 38.7	85 0 28.0	+23.9
42	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
43	47 38	2.0	29.0	8.1	3.0	34	. .	242	. .	300	. .	30.5	47 41 56.9	56.8	+ 1 3.2	98 49 21.3	+ 2.8
44	44 36	6.0	2.1	13.0	6.2	31	205	215	. .	. .	. .	30.5	44 40 40.2	. .	+ 56.6	95 47 58.0	. .
45	44 4	8.8	4.8	15.7	9.8	31	. .	. .	. .	352	378	30.5	44 8 34.6	59.0	+ 55.6	95 15 51.4	. .
46	346 24	2.2	28.5	8.8	4.6	33	. .	. .	. .	220	224	30.5	346 28 13.6	. .	— 13.8	37 34 21.0	— 0.8
47	11 42	5.2	4.6	16.0	10.4	36	. .	. .	. .	402	408	30.5	11 45 19.0	. .	+ 11.9	62 51 52.1	+ 0.7
48	32 0	3.1	0.0	10.6	5.4	34	. .	125	. .	138	. .	30.5	32 3 57.5	. .	+ 35.9	83 10 54.6	+ 2.0
49	33 58	3.2	29.9	11.5	7.0	34	. .	670	. .	700	. .	30.5	34 1 48.4	59.2	+ 38.7	85 8 48.3	+ 1.7

No.	Barom.	At. Ther.
	in.	°
1	30.06	63.0
5	30.06	70.2
8	30.06	72.5
19	30.08	65.6
43	30.09	60.2
45	30.05	60.5
49	30.04	61.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
4	— 6.1	+ 16 1.3	. .	+ 15 55.2
5	— 6.2	— 16 1.3	. .	— 16 7.5
7	—50 3.4	+ 14 47.9	. .	— 35 15.5
44	— 6.2	— 16 3.3	. .	— 16 9.5
45	— 6.2	+ 16 3.3	. .	+ 15 57.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Oct. 7	1	B. A. C. 6246 . . .	F.	25.9	30.0	32.4	42.1	45.4	48.6	58.4	1.0	5.0	17 45.42	+ 0.31	. .	−44.76	18 17 0.97	− 0.55
	2	B. A. C. 6427 . .	F.	. .	. .	56.7	59.2	1.6	4.0	8.9	10.6	. .	45 59.16	− 0.16	. .	−44.78	18 45 14.22	− 1.40
	3	XVIII, 23 . . .	F.	. .	. .	17.9	20.0	22.2	24.4	28.8	30.4	33.2	47 20.02	− 0.90	. .	−44.78	18 46 34.34	− 2.50
	4	*d* Sagittarii . . .	F.	54.6	57.2	58.8	5.4	7.5	9.6	16.0	17.7	20.4	11 7.47	− 0.87	−44.78	−44.79	19 10 21.81	+ 0.01
	5	B. A. C. 6594 . .	F.	57.9	0.9	2.7	9.8	12.4	15.0	22.2	23.9	27.0	13 12.42	− 0.96	. .	−44.80	19 12 26.66	− 2.92
	6	Moon I, S. . . .	F.	. .	. .	9.2	11.7	14.0	16.3	18.7	. .	. .	19 13.98	− 1.01	. .	−44.80	19 18 28.17	+70.19
	7	γ Aquilæ	F.	54.0	56.8	58.2	. .	. .	. .	14.7	16.2	18.9	41 6.47	− 0.49	−44.78	−44.81	19 40 21.17	0.00
	8	α Aquilæ	F.	16.3	19.0	20.4	26.5	28.6	30.8	36.9	38.5	41.0	45 28.67	− 0.52	−44.82	−44.82	19 44 43.33	+ 0.04
	9	λ Ursæ Minoris . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	48 34.90	+41.31	. .	−44.82	19 48 31.39	− 1.45
	10	β Aquilæ	F.	45.9	48.4	50.0	56.0	58.0	0.1	6.3	7.8	10.5	49 58.11	− 0.55	−44.87	−44.82	19 49 12.74	+ 0.08
	11	XIX, 16 . . .	F.	. .	. .	. .	53.3	55.8	58.1	3.0	4.8	7.7	51 53.41	− 1.05	. .	−44.82	19 51 7.54	− 3.16
	12	α^2 Capricorni. . .	F.	45.6	47.2	51.4	53.5	55.6	57.6	59.7	4.0	5.5	11 55.57	− 0.79	−44.89	−44.83	20 11 9.95	+ 0.10
	13	π Capricorni. . .	F.	45.6	48.3	49.9	56.4	58.6	0.7	7.0	8.8	11.6	20 58.54	− 0.86	−44.79	−44.84	20 20 12.84	− 0.02
	14	ε Delphini . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	15	μ Aquarii (R.) . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	16	B. A. C. 7349 . .	F.	45.5	49.0	51.0	59.0	1.6	4.4	12.6	14.7	18.0	5 1.76	− 1.22	. .	−44.87	21 4 15.67	− 3.97
	17	Transit Zones 176, 4	F.	29.2	32.0	33.5	40.2	42.5	44.7	51.1	52.9	55.6	8 42.41	− 0.92	. .	−44.87	21 7 56.62	− 3.34
	18	β Cephei (R.) . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	19	β Cephei	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	20	XXI, 13 . . .	F.	. .	35.0	37.0	39.2	41.5	43.8	48.0	49.7	52.4	32 39.31	− 0.88	. .	−44.89	21 31 53.54	− 3.38
	21	μ Capricorni. . .	F.	5.2	7.9	9.4	15.9	18.0	20.1	26.3	27.8	30.4	47 17.89	− 0.80	−44.98	−44.89	21 46 32.20	+ 0.12
	22	79 Draconis . . .	F.	. .	. .	. .	. .	. .	. .	32.4	36.6	45.8	52 3.49	+ 1.92	. .	−44.89	21 51 20.52	+ 0.21
	23	B. A. C. 8113 . .	F.	40.0	42.9	44.7	51.9	54.2	6.8	4.0	5.9	9.0	12 54.38	− 1.08	. .	−44.95	23 12 8.35	− 4.04
	24	B. A. C. 8172 . .	F.	53.3	56.2	58.0	5.7	8.3	10.8	18.3	20.0	23.3	22 8.21	− 1.15	. .	−44.96	23 21 22.10	− 4.16
	25	B. A. C. 8201 . .	F.	50.5	53.8	55.8	3.7	6.2	8.7	16.7	18.7	21.9	27 6.22	− 1.18	. .	−44.96	23 26 20.08	− 4.25
	26	Eurydice . . .	F.	16.0	18.9	20.3	26.5	28.4	30.5	36.7	38.3	40.7	39 28.48	− 0.64	. .	−44.97	23 38 42.87	. .
	27	Concordia . . .	F.	. .	. .	44.4	46.2	. .	50.6	52.6	. .	. .	52 48.46	− 0.67	. .	−44.98	23 52 2.81	. .
	28	α Andromedæ . .	F.	30.3	33.2	34.9	41.8	44.1	46.5	53.4	55.0	58.0	2 44.13	− 0.23	−44.93	−44.99	0 1 58.91	− 0.04
	29	Victoria . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	30	γ Pegasi	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	31	B. A. C. 136 . .	F.	11.1	14.4	16.0	23.7	26.4	28.9	36.4	38.1	41.2	28 26.24	− 1.13	. .	−45.00	0 27 40.11	− 4.07
	32	β Ceti	F.	. .	. .	4.0	6.3	8.4	10.5	12.7	. .	. .	38 8.38	− 0.86	−45.00	−45.01	0 37 22.51	+ 0.04
	33	Echo	F.	3.5	6.3	7.8	13.9	16.0	18.2	24.3	26.0	28.4	46 16.04	− 0.56	. .	−45.01	0 45 30.47	. .
	34	B. A. C. 289 . .	F.	6.6	8.6	13.4	15.8	18.3	20.5	23.0	27.9	29.7	57 18.20	− 0.96	. .	−45.02	0 56 32.22	− 3.90
	35	Polaris	F.	. .	. .	3.0	29.0	55.0	22.0	48.0	. .	. .	13 55.40	+32.35	. .	−45.03	1 13 42.72	− 0.08
	36	θ^1 Ceti	F.	23.4	26.0	27.6	33.7	35.8	38.0	44.2	45.7	48.3	18 35.86	− 0.73	−45.09	−45.04	1 17 50.09	+ 0.07
	37	γ^1 Leonis	Sk.	38.8	41.6	43.2	49.7	51.9	54.0	0.6	2.3	5.0	13 51.90	− 0.38	−45.25	−45.25	10 13 6.27	− 0.02
	38	δ Leonis	Sk.	1.4	4.1	5.7	12.3	14.4	16.6	23.4	24.7	27.1	8 14.48	− 0.37	−45.27	−45.29	11 7 28.82	− 0.08
	39	β Leonis	Sk.	15.1	17.8	19.4	25.7	27.8	30.0	36.4	37.9	40.6	43 27.86	− 0.46	−45.32	−45.32	11 42 42.08	− 0.02
8	40	Sun I, N. . . .	Sk.	43.3	45.7	47.1	53.3	55.5	57.6	3.7	5.2	7.8	54 55.47	− 0.73	. .	−45.38	12 54 9.36	. .
	41	Sun II, S. . . .	Sk.	52.5	55.0	56.5	2.7	4.8	6.8	13.0	14.6	17.1	57 4.78	− 0.73	. .	−45.38	12 56 18.67	. .
	42	Polaris, S. P. . .	Sk.	. .	. .	57.0	33.0	3.0	37.0	10.0	. .	. .	15 2.80	−35.05	. .	−45.38	1 13 42.37	− 0.47
	43	α Bootis	Sk.	31.1	33.9	35.5	41.9	44.1	46.5	53.0	54.6	57.4	10 44.22	− 0.39	−45.37	−45.41	14 9 58.42	− 0.04
	44	Mercury I, N. . .	Sk.	42.1	44.7	46.2	52.5	54.8	57.2	3.6	5.0	7.9	27 54.89	− 0.88	. .	−45.46	14 27 8.55	+ 0.25
	45	ε Bootis	Sk.	4.4	7.1	8.8	15.8	18.3	20.5	27.5	29.2	31.9	40 18.17	− 0.27	−45.40	−45.43	14 39 32.47	− 0.05
	46	α^2 Libræ	Sk.	. .	. .	41.2	43.3	45.4	47.5	49.6	. .	. .	44 45.40	− 0.85	−45.61	−45.44	14 43 59.11	+ 0.16
	47	δ Ursæ Minoris . .	Sk.	. .	. .	. .	. .	. .	1.0	10.0	35.0	. .	12 51.51	+12.95	. .	−45.56	18 12 18.90	− 1.08
	48	Moon I, S. . . .	Sk.	26.4	29.2	31.0	38.0	40.5	42.7	49.6	51.3	54.4	14 40.34	− 1.00	. .	−45.48	20 13 53.86	+ 69.36
	49	ζ Cygni	Sk.	10.9	13.8	15.6	20.4	25.1	29.9	34.5	36.2	39.2	8 25.07	− 0.23	−45.58	−45.67	21 7 39.17	− 0.08

6, 11. Bisections at sets B and D.
9. Mean of four bisections with R. A. micrometer wire.
18. Bisections at set C.
26, 27, 29, 33. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	347 32	9 29.1	25.7	6.6	1.7	34	. .	016	. .	022	. .	31.5	347 36 4.5	. .	− 12.7	38 42 13.0	+10.9
2	6 26	10 3.4	1.1	11.8	5.7	38	. .	. .	. .	422	428	31.5	6 28 52.6	. .	+ 6.6	57 35 20.4	+10.2
3	60 18	3.6	0.2	10.7	6.2	31	. .	. .	. .	300	308	31.5	60 22 41.4	. .	+ 1 41.0	111 30 43.6	− 6.0
4	57 58	3.9	0.3	11.8	6.9	31	. .	754	. .	744	. .	31.5	58 2 33.8	. .	+ 1 32.4	109 10 27.4	+ 3.3
5	70 50	5.0	1.2	11.5	7.7	34	. .	840	. .	854	. .	31.5	70 53 45.6	55.2	+ 2 45.1	122 2 51.9	− 8.0
6	67 21	8 5.2 12 5.7	1.6 1.1	11.4 11.9	8.8 6.8	36	000	. .	064	. .	100	31.5	67 24 27.1	. .	+ 2 17.9	118 33 6.2	. .
7	28 30	10 3.8	1.5	11.8	7.0	32	. .	414	. .	424	. .	31.5	28 34 23.4	. .	+ 31.5	79 41 16.1	+ 1.6
8	30 16	0.3	27.2	7.4	2.3	31	. .	942	. .	956	. .	31.5	30 20 34.8	. .	+ 33.9	81 27 29.9	+ 1.9
9	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
10	32 44	1.7	28.9	10.6	4.0	37	460	470	. .	. .	. .	31.5	32 47 8.0	. .	+ 37.3	83 54 6.5	+ 0.4
11	69 40	5.2	0.4	11.8	6.8	36	. .	. .	. .	. .	268	31.5	69 43 24.5	. .	+ 2 35.3	120 52 21.0	− 4.5
12	51 44	0.5	27.6	8.5	2.3	32	. .	374	. .	394	. .	31.5	51 48 12.3	. .	+ 1 13.6	102 55 47.1	+ 0.7
13	57 26	2.5	29.9	9.9	4.5	36	. .	. .	. .	902	912	31.5	57 29 16.6	. .	+ 1 30.8	108 37 8.6	+ 0.3
14	27 56	7.1	4.6	15.4	9.2	33	. .	. .	. .	162	170	31.5	28 0 9.3	. .	+ 30.9	79 7 1.4	+ 0.8
15	131 36	3.0	0.8	10.1	7.5	31	820	830	. .	. .	. .	31.5	131 40 32.9	. .	− 1 5.2	99 26 53.5	− 1.4
16	79 30	3.8	29.7	9.5	5.3	30	. .	. .	. .	900	894	31.5	79 34 48.0	. .	+ 5 6.1	130 46 15.3	− 1.0
17	61 6	3.5	29.7	11.9	6.7	27	. .	526	. .	554	. .	31.5	61 11 38.5	. .	+ 1 45.4	112 19 45.1	+ 5.0
18	211 2	7.6	4.2	13.8	11.2	30	286	. .	. .	. .	300	31.5	211 6 52.7	50.6	+ 35.2	19 58 53.3	− 1.9
19	328 50	5.2	1.2	11.5	7.2	37	. .	. .	. .	482	522	31.5	328 53 7.1	. .	− 35.2	19 58 53.1	− 2.1
20	59 0	4.6	1.0	11.5	6.8	37	. .	. .	. .	550	556	31.5	59 3 4.9	. .	+ 1 37.0	110 11 3.1	+ 7.8
21	52 56	0.0	26.1	7.7	2.3	32	. .	. .	. .	. .	474	31.5	53 0 27.2	. .	+ 1 17.3	104 8 5.7	− 2.7
22	325 44	10.6	6.9	17.9	14.2	36	. .	. .	. .	. .	422	31.5	325 47 18.5	. .	− 40.2	16 52 59.5	+ 1.3
23	72 0	7.4	1.4	10.7	7.9	36	. .	984	. .	000	. .	31.5	72 3 12.3	49.0	+ 3 2.5	123 12 36.0	+13.7
24	75 0	4.0	29.0	9.0	5.2	35	010	020	. .	. .	. .	31.5	75 3 44.6	. .	+ 3 36.0	126 13 41.8	+14.0
25	77 16	1.4	26.8	6.3	3.1	35	246	285	. .	342	352	31.5	77 19 42.8	. .	+ 4 14.7	128 30 18.7	+14.0
26	40 8	9 29.7	25.3	8.1	2.4	36	. .	664	. .	680	. .	31.5	40 13 55.8	. .	+ 49.5	91 21 6.5	− 6.0
27	42 44	10 3.0	28.4	9.9	4.6	40	. .	228	. .	216	. .	31.5	42 48 58.8	. .	+ 54.2	93 56 14.2	− 3.2
28	10 26	0.2	29.4	10.2	4.6	37	702	728	. .	. .	. .	31.5	10 29 4.6	. .	+ 10.8	61 35 36.6	+ 1.7
29	25 48	3.4	0.7	12.3	6.4	32	. .	. .	. .	834	842	31.5	25 54 50.6	. .	+ 28.5	77 1 40.3	− 3.6
30	24 18	3.0	28.9	10.0	4.4	28	. .	. .	. .	256	266	31.5	24 23 29.4	. .	+ 26.6	75 30 17.2	0.0
31	74 26	1.9	25.7	6.4	2.7	33	. .	. .	. .	295	. .	31.5	74 30 14.3	. .	+ 3 28.4	125 40 3.9	+19.9
32	57 28	9 29.9	27.4	7.8	4.9	33	. .	630	. .	636	. .	31.5	57 32 8.2	. .	+ 1 31.9	108 40 1.3	+ 1.1
33	34 4	10 0.6	27.5	8.6	4.9	41	. .	688	. .	694	. .	31.5	34 8 37.4	. .	+ 39.8	85 15 38.4	− 3.9
34	71 0	3.6	29.8	11.1	6.0	34	. .	206	. .	214	. .	31.5	71 3 56.6	47.6	+ 2 49.3	122 13 7.1	+22.4
35	310 12	1.0	1.7	9.3	8.0	34	148	142	118	126	070	31.5	310 15 58.5	. .	− 1 9.2	1 21 10.5	+ 0.2
36	47 38	9 29.5	27.7	6.0	4.0	34	. .	540	. .	546	. .	31.5	47 41 55.0	47.5	+ 1 4.4	98 49 20.6	+ 2.0
37	18 20	10 2.6	1.7	12.7	5.8	29	. .	906	. .	954	. .	30.5	18 25 0.7	53.3	+ 19.3	69 31 41.2	− 0.3
38	17 36	1.3	1.3	13.0	4.2	30	. .	150	. .	230	. .	30.5	17 40 57.7	. .	+ 18.4	68 47 37.3	0.0
39	23 32	0.2	0.7	13.1	5.2	29	. .	594	. .	712	. .	30.5	23 37 6.0	. .	+ 25.2	74 43 52.4	+ 0.6
40	44 28	5.2	2.2	14.4	8.5	35	470	468	. .	. .	. .	30.5	44 31 34.2	. .	+ 56.1	95 38 51.5	. .
41	45 0	4.7	29.8	12.0	6.0	35	. .	. .	. .	190	200	30.5	45 3 40.0	61.5	+ 57.2	96 10 58.4	. .
42	307 30	0.5	0.0	10.3	7.4	35	180	. .	070	. .	140	30.5	307 33 42.0	. .	− 1 14.0	358 38 49.2	− 0.7
43	19 0	3.2	1.0	13.8	7.0	35	. .	940	. .	000	. .	30.5	19 3 27.8	. .	+ 19.6	70 10 8.6	+ 3.2
44	56 34	0.0	28.3	9.8	4.6	32	. .	994	. .	033	. .	30.5	56 38 16.0	. .	+ 1 25.9	107 46 3.1	. .
45	11 14	2.3	1.7	14.2	7.7	35	. .	892	. .	950	. .	30.5	11 17 28.4	. .	+ 11.3	62 24 0.9	+ 3.1
46	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	65.3	. .	. . . .	. .
47	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
48	64 44	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
49	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	58.8	. .	. . . .	. .

No.	Barom.	At. Ther.
	in.	°
5	30.05	58.2
19	30.06	55.0
23	30.08	53.0
34	30.07	51.0
37	30.09	52.7
41	30.09	60.4
46	30.04	64.0
49	30.08	61.2

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
6	−50 34.3	− 14 59.4	. .	−1 5 33.7
40	− 6.2	+ 16 3.4	. .	+ 15 57.2
41	− 6.3	− 16 3.4	. .	− 16 9.7
44	− 7.6	+ 3.5	. .	− 4.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan's Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Oct. 8	1	β Aquarii	Sk.	. .	38.4	40.0	44.0	. .	. .	. .	. .	. .	25 48 16	− 0.74	−45.72	−45.68	21 25 1.74	− 0.07
	2	Saturn I, S.	Sk.	28.0	30.5	32.2	. .	. .	. .	49.5	50.9	53.5	30 40.77	− 0.86	. .	−45.66	21 29 54.25	. .
	3	Saturn II, N.	Sk.	. .	. .	39.6	41.5	43.7	45.9	48.0	. .	. .	30 43.74	− 0.86	. .	−45.66	21 29 57.22	. .
	4	ε Pegasi	Sk.	. .	. .	47.9	49.9	51.9	. .	0.0	1.6	4.1	38 51.84	− 0.54	−45.68	−45.69	21 38 5.61	0.00
	5	α Ursæ Majoris	P.	20.3	25.8	29.2	42.4	46.8	51.3	4.4	7.5	13.2	56 46.77	+ 0.83	. .	−46.26	10 56 1.34	− 0.06
	6	β Leonis	P.	16.1	19.0	20.5	26.7	28.7	30.7	37.2	38.8	41.5	43 28.80	− 0.48	−46.22	−46.29	11 42 42.03	− 0.09
	7	γ Ursæ Majoris	P.	41.0	45.2	47.8	58.4	2.0	5.4	16.0	18.3	23.0	48 1.90	+ 0.41	. .	−46.29	11 47 16.02	+ 0.05
9	8	Sun I, N.	P.	24.3	26.8	28.3	34.5	36.6	38.5	44.7	46.3	49.1	58 36.57	− 0.77	. .	−46.32	12 57 49.48	. .
	9	Sun II, S.	P.	33.7	36.3	37.9	43.9	46.0	48.3	54.2	55.8	58.3	0 46.04	− 0.77	. .	−46.32	12 59 58.95	. .
	10	Polaris, S. P.	P.	. .	53.0	. .	. .	. .	. .	. .	. .	. .	15 1.52	−35.65	. .	−46.35	1 13 39.52	− 3.36
	11	α Bootis	P.	32.3	34.9	36.5	43.0	45.1	47.4	53.9	55.5	58.3	10 45.21	− 0.41	−46.35	−46.38	14 9 58.42	− 0.03
	12	ε Bootis	P.	5.3	8.2	10.0	16.9	19.3	21.4	28.4	30.2	33.0	40 19.19	− 0.29	−46.41	−46.40	14 39 32.50	− 0.01
	13	α Coronæ Borealis	P.	57.4	0.4	2.2	8.8	11.2	13.5	20.5	22.2	25.0	30 11.24	− 0.30	−46.34	−46.43	15 29 24.51	− 0.09
	14	XVIII, 20	P.	25.2	27.9	29.5	36.2	38.4	40.6	47.2	48.8	51.6	39 38.38	− 0.97	. .	−46.55	18 38 50.86	− 2.43
	15	β Lyræ	P.	1.3	4.4	6.2	13.5	15.9	18.4	25.7	27.5	30.6	46 15.94	− 0.14	−46.56	−46.55	18 45 29.25	+ 0.04
	16	ζ Aquilæ	P.	16.2	18.9	20.5	26.7	28.8	30.9	37.2	38.8	41.4	0 28.82	− 0.47	−46.61	−46.56	18 59 41.79	+ 0.13
	17	d Sagittarii	P.	56.3	59.1	0.7	7.1	9.4	11.5	18.0	19.7	22.4	11 9.36	− 0.92	−46.65	−46.56	19 10 21.88	+ 0.11
	18	δ Draconis	P.	43.9	50.6	54.7	10.6	15.9	21.1	37.3	41.0	47.6	13 15.86	+ 1.32	. .	−46.56	19 12 30.62	− 0.59
	19	δ Aquilæ	P.	48.9	51.6	53.0	59.0	1.1	3.2	9.3	10.9	13.4	20 1.16	− 0.62	−46.62	−46.57	19 19 13.97	+ 0.10
	20	B. A. C. 6684	P.	44.2	47.2	49.0	56.2	58.5	0.8	8.0	9.8	12.8	25 58.50	− 1.10	. .	−46.58	19 25 10.82	− 2.94
	21	Mars I, S.	P.	12.7	15.5	17.4	24.2	26.4	28.6	35.2	36.9	39.8	33 26.30	− 1.00	. .	−46.58	19 32 38.72	+ 0.43
	22	γ Aquilæ	P.	55.8	58.4	0.0	6.2	8.2	10.4	16.5	18.0	20.6	41 8.23	− 0.52	−46.54	−46.59	19 40 21.12	− 0.02
	23	α Aquilæ	P.	18.0	20.6	22.2	28.4	30.4	32.5	38.7	40.2	42.9	45 30.43	− 0.54	−46.59	−46.59	19 44 33.30	+ 0.04
	24	λ Ursæ Minoris	P.	29.0	. .	. .	. .	25.0	16.0	. .	9.0	25.0	48 26.28	+44.75	. .	−46.59	19 48 24.44	− 5.50
	25	λ Ursæ Minoris	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	26	XIX, 17	P.	20.3	23.4	25.3	32.8	35.4	37.9	45.3	47.2	50.2	52 35.31	− 1.18	. .	−46.60	19 51 47.53	− 3.26
	27	B. A. C. 6863	P.	. .	. .	. .	36.0	40.0	43.8	47.3	. .	. .	53 39.84	+ 0.64	. .	−46.60	19 52 53.88	− 0.80
	28	ε Delphini (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	29	ε Delphini	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	30	Eurydice	P.	12.3	14.6	16.5	20.7	22.6	24.7	. .	. .	. .	38 24.61	− 0.70	. .	−46.75	23 37 37.16	. .
	31	Metis	P.	59.4	2.1	3.5	9.8	11.9	14.0	20.3	21.8	24.6	47 11.93	− 0.84	. .	−46.75	23 46 24.34	. .
	32	Victoria	P.	17.6	20.3	22.0	28.1	30.3	32.3	38.6	40.1	42.7	2 30.22	− 0.51	. .	−46.76	0 1 42.95	. .
	33	B. A. C. 38	P.	34.4	37.7	39.6	47.6	50.4	53.3	1.3	3.3	6.7	9 50.48	− 1.33	. .	−46.77	0 9 2.38	− 4.30
	34	B. A. C. 69	P.	17.1	20.6	22.5	30.4	33.2	35.8	43.9	45.7	49.0	15 33.13	− 1.31	. .	−46.77	0 14 45.05	− 4.26
	35	Lalande 512	P.	38.3	40.9	42.4	48.5	50.6	52.6	58.7	0.3	2.9	19 50.58	− 0.67	. .	−46.77	0 19 3.14	− 3.40
	36	B. A. C. 136	P.	13.1	16.3	18.2	25.6	28.1	30.7	38.2	40.0	43.3	28 28.17	− 1.22	. .	−46.78	0 27 40.17	− 4.08
	37	α Cassiopeæ (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	38	α Cassiopeæ	P.	. .	. .	. .	. .	. .	. .	30.0	32.6	37.1	34 15.31	+ 0.48	. .	−46.76	0 33 29.03	− 0.16
	39	Echo	P.	17.3	20.0	21.6	27.6	29.8	31.8	37.8	39.2	42.2	44 29.70	− 0.63	. .	−46.79	0 43 42.28	. .
	40	Schjellerup 337	P.	30.3	32.9	34.5	40.5	42.5	44.6	50.7	52.4	55.0	52 42.60	− 0.64	. .	−46.80	0 51 55.16	− 3.42
	41	Durch. 3°, 133.	P.	. .	. .	2.0	4.0	6.1	8.2	10.1	. .	. .	53 6.08	− 0.64	. .	−46.80	0 52 18.64	− 3.42
	42	Weisse 982	P.	51.6	54.0	55.6	1.8	4.0	6.0	12.0	13.5	16.1	58 3.84	− 0.62	. .	−46.80	0 57 16.42	− 3.42
	43	B. A. C. 334	P.	19.7	22.8	24.8	32.0	34.5	37.0	44.4	46.4	49.7	3 34.59	− 0.14	. .	−46.81	1 2 47.64	− 3.48
	44	Polaris	P.	. .	. .	. .	26.0	. .	. .	. .	. .	33.0	13 53.05	+33.93	. .	−46.78	1 13 40.20	− 2.69
	45	Neptune	P.	. .	. .	50.0	52.0	54.2	56.3	58.4	. .	. .	2 54.18	− 0.54	. .	−46.85	2 2 6.79	. .
12	46	XIX, 17	F.	34.0	37.2	39.0	46.3	49.0	51.5	59.0	0.9	4.0	51 48.99	− 1.47	. .	− 0.35	19 51 47.17	− 3.20
	47	B. A. C. 6863	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	λ Ursæ Minoris	F.	. .	. .	. .	. .	. .	. .	. .	. .	39.0	47 38.20	+49.90	. .	− 0.36	19 48 27.74	+ 1.82
	49	π Capricorni	F.	1.4	4.0	5.7	12.0	14.2	16.5	22.9	24.5	27.3	20 14.28	− 1.14	− 0.34	− 0.42	20 20 12.72	− 0.05

24. Bisections at set C.
25. Bisections at wires D_2 and D_3.
30, 31, 32, 39, 41. Wire A used.
40. Wire B used.
43. Bisections at wires III, VI, and VII.
48. Transit and bisection at wire D_3.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
2	54 4	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
3	54 4	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
4	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
5	336 24	9 28.1	27.6	8.1	3.5	30	. .	. .	. .	990	045	30.5	336 28 49.4	. .	− 25.3	27 34 45.3	− 0.8
6	23 32	29.7	28.7	11.5	5.0	29	. .	580	. .	690	. .	30.5	23 37 7.4	. .	+ 25.3	74 43 53.9	+ 1.9
7	344 26	29.1	27.9	8.9	4.3	31	. .	. .	. .	112	135	30.5	344 30 46.7	57.1	− 16.0	35 36 51.9	+ 0.4
8	44 50	10 0.0	25.3	7.7	2.3	32	520	550	. .	. .	. .	30.5	44 54 25.4	. .	+ 57.3	96 1 43.9	. .
9	45 22	0.8	27.4	10.3	3.3	32	. .	. .	. .	080	128	30.5	45 26 30.0	59.3	+ 58.4	96 33 49.6	. .
10	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
11	19 0	1.0	28.8	12.3	4.6	36	090	080	. .	052	093	30.5	19 3 28.4	62.3	+ 19.7	70 10 9.3	+ 3.8
12	11 14	0.0	28.3	9.5	3.7	36	190	200	. .	162	202	30.5	11 17 28.1	. .	+ 11.4	62 24 0.7	+ 2.7
13	11 42	9 29.7	28.6	10.2	4.5	36	. .	652	. .	645	. .	30.5	11 45 20.5	61.1	+ 11.9	62 51 53.6	+ 1.9
14	61 20	29.6	26.7	8.0	3.5	36	985	965	. .	180	160	31.0	61 23 15.5	. .	+ 1 45.3	112 31 22.0	− 6.9
15	5 36	10 2.0	0.2	11.0	5.2	32	. .	940	. .	970	. .	31.0	5 40 16.3	. .	+ 5.7	56 46 43.2	+ 1.2
16	25 8	1.4	0.0	10.8	5.2	32	525	565	. .	608	622	31.0	25 12 22.2	56.5	+ 27.2	76 19 10.6	+ 3.2
17	57 58	0.8	27.5	8.3	4.0	31	805	835	. .	. .	. .	31.0	58 2 34.9	. .	+ 1 32.3	109 10 28.4	+ 4.2
18	331 24	9 29.2	27.8	8.0	3.8	36	. .	. .	. .	440	505	31.0	331 27 26.2	. .	− 31.4	22 33 16.0	+ 1.3
19	35 56	10 0.2	27.0	7.9	2.4	30	850	815	. .	905	930	31.0	36 0 50.7	. .	+ 42.0	87 7 53.9	+ 1.6
20	69 24	0.7	26.5	7.7	3.7	31	. .	195	. .	235	. .	31.0	69 28 45.0	. .	+ 2 33.1	120 37 39.3	− 6.6
21	63 20	0.3	27.4	8.0	3.0	29	855	810	. .	880	940	31.0	63 25 5.5	55.5	+ 1 54.9	114 33 21.6	. .
22	28 30	1.2	29.1	9.0	5.1	32	. .	555	. .	580	. .	31.0	28 34 23.1	. .	+ 31.5	79 41 15.8	+ 1.3
23	30 16	1.5	28.6	7.9	3.6	31	810	795	. .	. .	. .	31.0	30 20 35.2	. .	+ 33.9	81 27 30.3	+ 2.3
24	309 54	9 29.6	27.8	6.6	4.3	31	. .	. .	460	500	. .	31.0	309 58 41.2	. .	− 1 8.9	1 3 53.5	+ 1.3
25	309 54	10 1.0	29.3	8.2	5.4	31	. .	. .	. .	580	700	31.0	309 58 41.0	. .	− 1 8.9	1 3 53.3	+ 1.1
26	73 48	2.8	28.8	8.2	5.3	32	490	528	. .	. .	. .	31.0	73 52 23.0	. .	+ 3 17.4	125 2 1.6	− 6.0
27	340 54	9 27.0	25.0	4.0	1.4	32	. .	. .	. .	525	545	31.0	340 58 28.9	. .	− 20.0	32 4 30.1	+18.2
28	151 56	10 3.8	1.5	11.9	8.2	34	450	410	. .	. .	. .	31.0	151 59 51.3	53.3	− 30.9	79 7 0.8	+ 1.3
29	27 56	1.5	29.0	9.8	4.9	33	. .	. .	. .	530	460	31.0	28 0 9.0	. .	+ 30.9	79 7 1.1	+ 0.6
30	40 6	0.7	27.0	9.0	3.7	36	. .	310	. .	315	. .	30.3	40 11 58.8	. .	+ 49.1	91 19 9.1	− 6.0
31	49 52	3.8	0.0	10.1	4.8	36	. .	145	. .	205	. .	30.3	49 57 58.8	. .	+ 1 9.0	101 5 29.0	− 5.2
32	26 10	5.6	1.9	11.6	8.5	30	. .	660	. .	705	. .	30.3	26 17 20.8	. .	+ 28.7	77 24 10.7	− 3.6
33	79 32	6.4	1.5	10.4	7.2	34	895	940	. .	. .	. .	30.3	79 35 42.7	. .	+ 5 6.1	130 47 10.0	+17.2
34	78 40	0.6	25.5	4.8	2.5	31	905	920	. .	. .	. .	30.3	78 44 34.3	. .	+ 4 43.7	129 55 39.2	+17.9
35	37 34	1.3	27.6	8.8	4.0	35	415	365	. .	. .	. .	30.3	37 37 39.4	. .	+ 44.8	88 44 45.4	+22.9
36	74 26	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
37	196 54	4.1	2.0	11.5	5.6	35	660	695	. .	. .	. .	30.3	196 57 31.3	. .	+ 17.7	34 8 32.2	− 0.3
38	342 58	0.3	27.4	7.4	3.5	32	. .	. .	. .	285	315	30.3	343 2 33.5	. .	− 17.7	34 8 37.0	+ 4.5
39	34 18	2.2	28.8	10.1	4.8	35	. .	. .	. .	400	. .	30.3	34 24 11.7	. .	+ 39.8	85 31 12.7	− 3.9
40	35 14	0.0	26.7	8.0	2.8	34	620	650	. .	. .	. .	30.3	35 15 19.1	. .	+ 41.1	86 22 21.4	+23.9
41	35 14	0.0	26.7	8.0	2.8	33	. .	. .	. .	320	355	30.3	35 20 45.4	. .	+ 41.2	86 27 47.8	+24.0
42	34 16	1.1	28.9	9.3	4.8	39	. .	. .	. .	040	050	30.3	34 18 43.6	. .	+ 39.7	85 25 44.5	+24.0
43	3 52	2.3	1.0	10.4	5.0	34	900	. .	. .	955	980	30.3	3 55 45.2	. .	+ 4.0	55 2 10.4	+23.1
44	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	51.4	. .	. . . .	. .
45	28 20	0.3	28.0	7.7	3.5	36	. .	200	. .	250	265	30.3	28 23 27.5	51.6	+ 31.4	79 30 20.1	. .
46	73 48	9 27.8	23.7	5.8	2.3	32	. .	. .	. .	990	998	31.8	73 52 20.9	. .	+ 3 21.2	125 2 3.3	− 6.1
47	340 54	28.8	27.7	7.7	4.7	32	. .	. .	. .	. .	318	31.8	340 58 30.6	. .	− 20.4	32 4 31.4	+18.5
48	309 54	10 3.9	1.9	12.5	8.5	31	. .	. .	. .	. .	280	31.8	309 58 44.9	. .	− 1 10.2	1 3 55.9	+ 3.9
49	57 26	9 27.9	26.0	6.8	2.1	37	230	240	. .	. .	. .	31.8	57 29 14.7	. .	+ 1 33.0	108 37 8.9	+ 0.4

No.	Barom.	At. Ther.
	in.	°
7	30.24	57.4
9	30.19	59.4
11	30.14	61.0
13	30.12	61.6
16	30.10	58.7
21	30.09	57.6
28	30.09	55.5
44	30.02	53.4
46	30.00	53.3

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
8	− 6.2	+ 16 2.8	. .	+ 15 56.5
9	− 6.3	− 16 2.8	. .	− 16 9.1
21	− 9.0	− 5.8	. .	− 14.8
45	− 0.1	. .	. .	− 0.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Oct. 12	1	ε Delphini (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	2	ε Delphini	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	3	α Cygni	F.	54.8	58.4	0.5	9.4	12.2	15.0	23.8	25.9	29.4	37 12.16	+ 0.10	− 0.37	− 0.43	20 37 11.83	− 0.04
	4	ν Cygni	F.	17.0	20.3	22.3	30.4	33.0	35.9	44.0	45.9	49.0	52 33.09	− 0.03	− 0.36	− 0.45	20 52 32.61	− 0.03
	5	σ^2 Ursæ Majoris, S. P.	F.	. .	. .	40.4	34.9	29.4	24.1	18.5	. .	. .	59 29.46	− 3.15	. .	− 0.48	8 59 25.83	+ 0.18
	6	61^1 Cygni	F.	. .	. .	18.0	20.5	23.2	25.9	30.9	32.9	36.1	1 20.60	− 0.10	− 0.54	− 0.48	21 1 20.02	+ 0.02
	7	ζ Cygni	F.	26.0	28.9	30.7	37.6	40.0	42.3	49.5	51.3	54.0	7 40.03	− 0.30	− 0.54	− 0.49	21 7 39.24	+ 0.06
	8	α Cephei (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	9	β Aquarii.	F.	50.8	53.4	55.0	1.0	3.1	5.2	11.3	12.9	15.4	25 3.12	− 0.93	− 0.54	− 0.50	21 25 1.69	+ 0.07
	10	Saturn I, N.	F.	22.6	25.1	26.7	. .	. .	. .	44.0	45.5	48.0	29 35.32	− 1.10	. .	− 0.54	21 29 33.68	. .
	11	Saturn II, S.	F.	. .	. .	32.4	34.5	36.7	38.7	40.9	. .	. .	29 36.64	− 1.10	. .	− 0.54	21 29 35.00	. .
	12	Mur. Zones 207, 63	F.	29.7	32.4	34.0	40.4	42.6	44.7	51.0	52.8	55.4	1 42.56	− 1.11	. .	− 0.54	22 1 40.91	− 3.36
	13	θ Aquarii.	F.	5.7	9.3	10.8	17.0	19.0	21.0	27.3	28.8	31.3	10 19.02	− 0.96	− 0.64	− 0.58	22 10 17.48	+ 0.08
	14	Lalande 43567	F.	39.0	41.7	43.0	49.6	51.8	54.0	0.3	1.8	4.4	13 51.73	− 1.08	. .	− 0.59	22 13 50.06	− 3.36
	15	Lalande 43596	F.	42.8	45.5	47.0	53.4	55.4	57.6	4.0	5.5	8.2	14 55.49	− 1.08	. .	− 0.59	22 14 53.82	− 3.36
	16	α Piscis Australis	F.	36.2	39.0	40.7	47.9	50.2	52.5	59.8	1.5	4.5	50 50.26	− 1.36	− 0.59	− 0.60	22 50 48.30	+ 0.03
	17	α Pegasi	F.	23.8	26.4	27.9	34.2	36.3	38.5	44.8	46.4	49.1	58 36.38	− 0.59	− 0.63	− 0.67	22 58 35.12	− 0.01
	18	ο Cephei	F.	. .	. .	21.7	27.3	32.6	37.7	43.0	. .	. .	13 32.46	+ 1.42	. .	− 0.69	23 13 33.19	+ 0.10
	19	B. A. C. 8172	F.	9.0	12.2	14.0	21.5	24.2	26.8	34.3	36.3	39.7	21 24.22	− 1.50	. .	− 0.72	23 21 22.00	− 4.13
	20	ι Piscium	F.	23.9	26.5	27.9	34.0	36.1	38.1	44.3	45.8	48.5	33 36.12	− 0.75	− 0.76	− 0.72	23 33 34.65	+ 0.04
	21	γ Cephei	F.	. .	. .	. .	. .	24.6	33.9	52.0	59.0	10.2	34 15.70	+ 3.20	. .	− 0.72	23 34 18.18	+ 0.40
	22	Moon I, S.	F.	16.3	18.8	20.3	. .	. .	. .	37.0	38.7	41.4	42 28.75	− 0.89	. .	− 0.75	23 42 27.11	+66.77
	23	ω Piscium	F.	46.0	48.7	50.3	56.5	58.4	0.4	6.6	8.2	10.7	52 58.42	− 0.73	− 0.76	− 0.76	23 52 56.93	+ 0.01
	24	Victoria	F.	36.5	39.0	40.6	46.6	48.8	51.0	57.3	58.7	1.3	59 48.87	− 0.63	. .	− 0.78	23 59 47.46	. .
	25	α Andromedæ	F.	46.1	49.0	50.8	57.6	0.0	2.2	9.3	10.9	14.0	1 59.99	− 0.33	− 0.69	− 0.78	0 1 58.88	− 0.07
	26	γ Pegasi	F.	40.2	42.8	44.4	. .	. .	. .	1.1	2.7	5.5	6 52.78	− 0.59	− 0.87	− 0.79	0 6 51.40	+ 0.08
	27	β Ceti	F.	11.6	14.3	16.0	22.3	24.6	26.7	33.1	34.8	37.6	37 24.56	− 1.14	− 0.88	− 0.84	0 37 22.58	+ 0.09
	28	Echo	F.	51.0	53.8	55.0	1.8	3.8	5.8	12.2	13.5	15.7	41 3.62	− 0.76	. .	− 0.86	0 41 2.00	. .
	29	ε Piscium	F.	20.3	22.7	24.2	30.3	32.4	34.6	40.6	42.2	44.8	56 32.46	− 0.71	− 0.89	− 0.86	0 56 30.89	+ 0.05
	30	Polaris	F.	. .	. .	9.0	37.0	3.0	30.0	57.0	. .	. .	13 3.20	+39.12	. .	− 0.88	1 13 41.48	− 1.48
13	31	Sun I, N.	Sk.	24.4	27.3	28.7	34.7	37.0	39.0	45.2	46.5	49.2	12 36.89	− 0.89	. .	− 1.89	13 12 34.11	. .
	32	Sun II, S.	Sk.	34.3	37.0	38.6	44.9	46.9	48.9	55.1	56.7	59.2	14 46.84	− 0.89	. .	− 1.89	13 14 44.06	. .
	33	Polaris, S. P.	Sk.	3.0	10.0	17.0	. .	. .	. .	. .	. .	. .	14 23.66	−43.36	. .	− 1.84	1 13 38.46	− 4.54
	34	Venus I, N.	Sk.	8.2	10.9	12.5	. .	. .	. .	29.2	30.6	33.3	35 20.78	− 0.90	. .	− 1.88	13 35 18.00	+ 0.34
	35	Venus II, S.	Sk.	. .	. .	17.2	19.4	21.5	23.6	25.6	. .	. .	35 21.46	− 0.90	. .	− 1.88	13 35 18.68	− 0.34
	36	α Bootis	Sk.	47.4	50.3	52.0	58.5	0.7	2.8	9.4	11.0	13.7	10 0.64	− 0.41	− 1.79	− 1.82	14 9 58.41	− 0.03
	37	ε Bootis	Sk.	20.7	23.5	25.3	32.0	34.5	36.8	43.7	45.5	48.4	39 34.49	− 0.25	− 1.76	− 1.81	14 39 32.43	− 0.07
	38	Mercury I, N.	Sk.	4.0	6.5	8.0	14.6	16.7	19.2	25.5	27.7	29.7	41 16.88	− 1.08	. .	− 1.85	14 41 13.95	+ 0.28
	39	β Ursæ Minoris.	Sk.	. .	. .	46.0	53.7	1.4	9.6	17.2	. .	. .	51 1.58	+ 2.87	. .	− 1.80	14 51 2.65	+ 0.20
	40	α Coronæ Borealis	Sk.	12.9	15.7	17.5	24.2	26.6	28.9	35.7	37.6	40.4	29 26.61	− 0.26	− 1.79	− 1.79	15 29 24.56	0.00
	41	α Serpentis	Sk.	57.9	0.3	2.0	8.2	10.3	12.5	18.5	20.2	22.6	38 10.28	− 0.64	− 1.83	− 1.79	15 38 7.85	+ 0.06
	42	ε Serpentis	Sk.	26.5	29.1	30.5	. .	38.8	41.0	43.0	. .	. .	44 38.83	− 0.68	− 1.84	− 1.79	15 44 36.36	+ 0.05
	43	δ Ursæ Minoris.	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	12 3.36	+15.08	. .	− 1.73	18 12 16.71	− 1.21
	44	α Lyræ	Sk.	29.6	32.9	34.7	42.6	45.2	47.8	55.6	57.5	0.7	32 45.18	− 0.08	− 1.70	− 1.72	18 32 43.38	0.00
	45	51 Cephei, S. P.	Sk.	. .	. .	. .	. .	6.0	24.0	41.0	. .	. .	42 6.09	−20.33	. .	− 1.72	6 41 44.04	+ 0.32
	46	B. A. C. 6427	Sk.	1.6	4.7	6.5	11.4	13.7	. .	18.6	21.0	. .	45 16.18	− 0.24	. .	− 1.73	18 45 14.21	− 1.26
	47	ζ Aquilæ	Sk.	31.5	34.0	35.6	41.9	44.0	46.0	52.3	53.9	56.6	59 43.98	− 0.60	− 1.71	− 1.71	18 59 41.67	+ 0.08
	48	δ Aquilæ	Sk.	4.3	6.7	8.3	14.4	16.3	18.3	24.5	26.0	28.5	19 16.37	− 0.78	− 1.73	− 1.70	19 19 13.89	+ 0.08
	49	γ Aquilæ	Sk.	10.8	13.5	15.0	21.4	23.4	25.3	31.6	33.2	35.8	40 23.33	− 0.66	− 1.56	− 1.70	19 40 20.97	− 0.11
	50	B. A. C. 6851	Sk.	25.5	28.6	30.4	35.3	37.9	40.3	42.8	45.5	. .	51 40.38	− 0.18	. .	− 1.70	19 51 38.50	− 1.58
	51	B. A. C. 6863	Sk.	31.5	36.4	39.4	50.9	54.6	58.5	10.0	12.9	17.7	52 54.66	+ 0.65	. .	− 1.70	19 52 53.61	− 0.65

5, 21, 22, 39. Bisections at sets B and D.
12. Micrometer revolutions reduced for 29ʳ to correspond with other observations.
14, 24, 28. Wire A used.
15. Wire B used.
32. Telescope micrometer reading decreased one revolution in reduction.
43. Mean of four bisections with R. A. micrometer.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° '	r. "	"	"	"							"	° ' "	°	' "	° ' "	"
1	151 56	10 3.0	0.8	12.3	7.9	34	340	340	. .	. .	. .	31.8	151 59 53.8	. .	— 31.7	79 6 59.1	— 1.3
2	27 56	3.1	0.2	11.8	6.6	33	. .	. .	. .	400	404	31.8	28 0 9.6	. .	+ 31.7	79 7 2.5	+ 2.1
3	354 0	9 28.5	26.4	7.5	2.5	36	. .	728	. .	748	. .	31.8	354 3 22.6	43.8	— 6.2	45 9 37.6	+ 1.6
4	358 8	27.8	26.0	6.7	1.4	33	690	674	. .	. .	. .	31.8	358 12 10.0	. .	— 1.9	49 18 29.3	+ 3.3
5	286 32	10 1.7	27.8	8.2	6.0	37	. .	558	. .	578	. .	31.8	286 35 7.3	. .	— 3 19.2	337 38 9.3	+ 4.5
6	0 42	1.1	28.2	9.6	4.1	37	. .	. .	. .	540	536	31.8	0 45 8.8	. .	+ 0.8	51 51 30.8	+ 2.9
7	9 6	9 29.6	27.3	9.2	4.3	33	. .	166	. .	180	. .	31.8	9 10 15.7	. .	+ 9.7	60 16 46.6	+ 0.7
8	203 6	29.3	25.9	6.9	1.7	35	. .	. .	. .	416	426	31.8	203 9 42.1	38.8	+ 25.8	27 56 13.3	— 2.2
9	44 56	10 2.4	28.7	10.4	5.5	35	310	322	. .	. .	. .	31.8	44 59 40.7	. .	+ 1 0.3	96 7 2.2	+ 2.7
10	55 6	1.7	26.3	8.9	4.7	33	315	. .	. .	. .	385	31.8	55 10 12.3	. .	+ 1 26.3	106 17 59.8	. .
11	55 6	1.7	26.3	8.9	4.7	32	. .	188	. .	202	. .	31.8	55 10 30.1	. .	+ 1 26.3	106 18 17.6	. .
12	55 56	9 29.9	25.8	9.1	3.6	33	578	604	. .	. .	. .	31.8	56 1 10.4	. .	+ 1 29.4	107 9 1.0	+10.9
13	47 12	10 0.6	26.9	9.1	5.0	31	655	688	. .	. .	. .	31.8	47 16 37.8	. .	+ 1 5.3	98 24 4.3	+ 1.2
14	53 57	7 29.7	26.0	7.0	2.8	36	. .	715	. .	685	. .	31.8	54 2 55.5	. .	+ 1 23.1	105 10 39.8	+12.4
15		11 29.7	25.2	7.8	3.5	39	. .	182	. .	180	. .	31.8	53 57 11.7	. .	+ 1 22.8	105 4 55.7	+12.5
16	69 4	10 2.4	28.2	9.2	5.7	34	. .	566	. .	566	. .	31.8	69 7 52.7	39.0	+ 2 37.3	120 16 51.2	+ 0.5
17	24 18	9 27.3	25.3	7.3	2.5	38	775	790	. .	804	810	31.8	24 20 51.6	. .	+ 27.3	75 27 40.1	+ 2.0
18	331 24	25.0	22.2	5.0	1.1	33	. .	. .	. .	960	958	31.8	331 28 8.0	. .	— 32.9	22 33 56.3	— 0.5
19	75 0	10 1.6	26.4	8.1	4.7	35	. .	438	. .	500	. .	31.8	75 3 40.0	. .	+ 3 43.0	126 13 44.2	+13.1
20	33 52	9 29.1	24.9	7.5	4.1	35	408	418	. .	. .	. .	31.8	33 55 42.1	. .	+ 40.7	85 2 44.0	+ 2.2
21	321 54	10 4.1	1.3	12.6	9.2	33	. .	. .	. .	960	956	31.8	321 57 59.7	38.5	— 47.3	13 3 33.6	+ 2.3
22	42 52	7.8	4.0	16.5	10.7	35	025	. .	245	. .	480	31.8	42 55 36.6	38.4	+ 56.2	94 2 54.0	. .
23	32 38	9 28.7	26.4	8.6	2.5	32	886	902	. .	. .	. .	31.8	32 42 20.6	. .	+ 38.8	83 49 20.6	+ 0.4
24	26 46	26.1	23.3	5.3	0.6	40	. .	276	. .	258	. .	31.8	26 51 3 7	. .	+ 30.6	77 57 55.5	— 3.6
25	10 26	26.5	26.0	7.1	2.6	37	. .	986	. .	000	. .	31.8	10 29 4.0	. .	+ 11.2	61 35 36.4	+ 2.3
26	24 20	10 2.0	28.7	11.0	5.1	36	. .	014	. .	026	. .	31.8	24 23 32.9	38.2	+ 27.4	75 30 21.5	+ 4.8
27	57 28	9 28.9	25.7	8.3	4.1	33	. .	816	. .	840	. .	31.8	57 32 6.2	. .	+ 1 34.9	108 40 2.3	+ 1.5
28	34 42	10 2.2	28.8	11.4	6.3	38	. .	384	. .	348	. .	31.8	34 47 26.8	. .	+ 42.0	85 54 30.0	— 3.9
29	31 36	9 25.6	23.8	5.9	1.1	35	. .	952	. .	970	. .	31.8	31 39 36.4	37.5	+ 37.4	82 46 35.0	— 0.3
30	310 12	10 1.5	0.0	11.4	6.9	34	195	176	165	155	137	31.8	310 15 58.2	. .	— 1 11.5	1 21 7.9	— 0.5
31	46 22	1.5	27.0	10.3	5.5	38	214	288	. .	. .	. .	31.0	46 24 56.1	. .	+ 1 2.2	97 32 19.5	. .
32	46 54	0.8	27.3	11.0	4.8	38	. .	. .	. .	712	724	31.0	46 57 3.4	. .	+ 1 3.3	98 4 27.6	. .
33	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	49.5	. .	. . . .	. .
34	47 42	3.5	0.9	15.3	7.2	32	. .	. .	. .	864	. .	31.0	47 46 15.1	. .	+ 1 5.1	98 53 41.4	. .
35	47 42	3.5	0.9	15.3	7.2	32	. .	. .	. .	. .	206	31.0	47 46 25.0	. .	+ 1 5.1	98 53 51.3	. .
36	19 0	9 29.3	28.4	12.0	4.6	36	. .	. .	. .	261	270	31.0	19 3 26.9	. .	+ 20.4	70 10 8.5	+ 2.2
37	11 14	10 0.6	1.0	14.5	6.5	35	970	928	. .	. .	. .	31.0	11 17 29.1	. .	+ 11.8	62 24 2.1	+ 3.3
38	57 54	0.6	29.2	12.4	4.7	33	. .	. .	. .	098	090	31.0	57 58 14.2	. .	+ 1 34.0	109 6 9.4	. .
39	324 10	9 29.5	29.5	11.8	5.7	31	. .	. .	. .	840	860	31.0	324 14 33.8	. .	— 42.4	15 20 12.6	+ 1.5
40	11 42	10 1.0	0.7	13.3	5.8	36	. .	400	. .	500	. .	31.0	11 45 22.1	. .	+ 12.3	62 51 55.6	+ 3.1
41	32 0	1.0	29.5	11.6	5.5	34	074	104	. .	. .	. .	31.0	32 3 58.6	52.1	+ 36.8	83 10 56.6	+ 3.5
42	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
43	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
44	0 10	4.8	2.0	14.3	8.2	36	. .	230	. .	260	. .	30.6	0 13 22.8	. .	+ 0.2	51 19 44.2	+ 1.2
45	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
46	6 26	9 29.0	29.5	9.4	3.5	38	396	456	. .	. .	. .	30.6	6 28 53.7	48.2	+ 6.7	57 35 21.6	+10.0
47	25 8	10 3.0	1.0	12.5	6.1	32	. .	523	. .	550	. .	30.6	25 12 21.1	. .	+ 27.9	76 19 10.2	+ 2.7
48	35 56	9 27.6	25.0	7.5	0.8	31	. .	000	. .	024	. .	30.6	36 0 49.8	. .	+ 43.1	87 7 54.1	+ 1.7
49	28 30	10 5.5	3.0	14.5	8.0	32	162	196	. .	. .	. .	30.6	28 34 24.2	. .	+ 32.4	79 41 17.8	+ 3.4
50	4 4	0.1	29.5	10.8	4.3	33	330	350	. .	. .	. .	30.6	4 8 10.8	. .	+ 4.3	55 14 36.3	+15.4
51	340 54	9 28.5	27.2	7.5	3.5	32	. .	. .	. .	370	378	30.6	340 58 28.7	. .	— 20.6	32 4 29.3	+18.5

No.	Barom.	At. Ther.
	in.	°
3	30.35	47.3
8	30.36	45.5
16	30.40	42.5
21	30.40	43.0
22	30.39	43.0
26	30.39	42.5
29	30.40	42.5
33	30.46	49.5
41	30.43	56.6
46	30.37	50.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
10	— 0.8	+ 8.9	. .	+ 8.1
11	— 0.8	— 8.9	. .	— 9.7
22	—39 58.7	— 16 5.8	. .	— 56 4.5
31	— 6.5	+ 16 4.2	. .	+ 15 57.7
32	— 6.5	— 16 4.2	. .	— 16 10.7
34	— 3.8	+ 5.0	. .	+ 1.2
35	— 3.8	— 4.9	. .	— 8.7
38	— 8.6	+ 3.8	. .	— 4.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Oct. 13	1	ε Delphini (R.) . .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	2	ε Delphini . . .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	3	B. A. C. 7212 . .	Sk.	50.0	53.3	55.2	0.4	3.1	5.7	8.4	10.8	. .	43 5.66	− 1.55	. .	− 1.67	20 43 2.44	− 3.64
	4	B. A. C. 7234 .	Sk.	22.7	26.0	28.0	36.0	38.9	41.5	49.6	51.6	54.9	45 38.80	− 1.60	. .	− 1.67	20 45 35.53	− 3.74
	5	B. A. C. 7349 . .	Sk.	. .	. .	13.4	16.2	19.0	21.5	24.3	. .	. .	4 18.88	− 1.62	. .	− 1.67	21 4 15.59	− 3.87
	6	B. A. C. 7399 . .	Sk.	35.7	38.9	40.9	48.0	50.5	52.9	0.5	2.4	5.5	12 50.59	− 0.19	. .	− 1.66	21 12 48.74	− 2.13
	7	d Ursæ Majoris, S.P.	Sk.	9.0	1.4	56.5	38.6	32.4	26.2	8.5	3.4	56.1	23 32.46	− 3.51	. .	− 1.66	9 23 27.29	+ 0.30
	8	Saturn I, S. . .	Sk.	19.3	22.0	23.5	. .	. .	. .	40.7	42.2	45.0	29 32.12	− 1.10	. .	− 1.66	21 29 29.36	. .
	9	Saturn II, N. . .	Sk.	. .	. .	29.1	31.3	33.5	35.6	37.7	. .	. .	29 33.44	− 1.10	. .	− 1.66	21 29 30.68	. .
	10	11 Cephei	Sk.	. .	. .	53.6	59.6	5.8	12.2	17.7	. .	. .	40 5.78	+ 1.86	. .	− 1.66	21 40 5.98	− 0.36
	11	B. A. C. 7632 . .	Sk.	42.8	45.9	47.9	55.6	58.2	0.9	8.7	10.6	13.7	48 58.26	− 1.54	. .	− 1.65	21 48 55.07	− 3.96
	12	B. A. C. 7684 . .	Sk.	25.7	29.2	31.3	39.2	41.8	44.6	52.6	54.4	58.0	58 41.87	− 1.60	. .	− 1.64	21 58 38.63	− 4.10
	13	B. A. C. 7701 . .	Sk.	57.4	0.5	2.3	9.7	12.4	14.8	22.0	23.9	27.0	1 12.22	− 1.43	. .	− 1.64	22 1 9.15	− 3.84
	14	Anonymous . .	Sk.	48.6	51.3	52.7	59.2	1.2	3.5	9.8	11.4	14.0	13 1.30	− 1.09	. .	− 1.63	22 12 58.48	− 3.37
	15	Lalande 43596. .	Sk.	44.0	46.6	48.2	54.5	56.6	58.7	5.0	6.5	9.0	14 56.57	− 1.07	. .	− 1.63	22 14 53.87	− 3.36
	16	ζ Pegasi	Sk.	. .	. .	. .	19.0	21.2	23.2	27.4	29.0	31.5	35 19.07	− 0.66	− 1.75	− 1.63	22 35 16.78	+ 0.18
	17	B. A. C. 7966 . .	Sk.	26.8	29.9	31.7	39.0	41.4	43.8	51.3	53.0	56.2	45 41.46	− 1.43	. .	− 1.62	22 45 38.41	− 3.97
	18	α Piscis Australis .	Sk.	37.3	40.2	41.9	49.0	51.5	53.8	0.9	2.7	5.6	50 51.43	− 1.36	− 1.76	− 1.63	22 50 48.44	+ 0.17
	19	α Pegasi	Sk.	24.8	27.5	29.0	33.0	35.3	37.5	39.4	41.5	. .	58 37.39	− 0.59	− 1.64	− 1.63	22 58 35.17	+ 0.04
	20	B. A C. 8045 . .	Sk.	47.3	50.6	52.8	0.5	3.3	5.6	13.9	15.9	19.2	0 3.23	− 1.58	. .	− 1.61	23 0 0.04	− 4.24
	21	B. A. C. 8332 . .	Sk.	55.0	57.9	59.8	6.9	9.3	11.7	18.7	20.6	23.4	53 9.26	− 1.36	. .	− 1.59	23 53 6.31	− 3.95
	22	B. A. C. 8343 . .	Sk.	7.7	10.8	12.8	21.0	23.6	26.4	34.5	36.8	40.3	55 23.77	− 1.60	. .	− 1.59	23 55 20.58	− 4.31
	23	α Andromedæ . .	Sk.	46.9	50.0	51.7	58.5	0.8	3.0	10.0	11.9	14.7	2 0.83	− 0.33	− 1.53	− 1.60	0 1 58.90	− 0.05
	24	γ Pegasi	Sk.	40.9	43.5	45.1	51.4	53.5	55.6	2.0	3.4	6.0	6 53.49	− 0.59	− 1.58	− 1.60	0 6 51.30	− 0.02
	25	B. A. C. 69. . .	Sk.	32.4	35.7	37.7	45.8	48.4	51.1	59.3	1.0	4.6	14 48.44	− 1.59	. .	− 1.58	0 14 45.27	− 4.26
	26	B. A. C. 136 . .	Sk.	28.3	31.5	33.3	40.8	43.5	46.0	53.5	55.3	58.6	27 43.42	− 1.48	. .	− 1.58	0 27 40.36	− 4.09
	27	Moon I, S. . . .	Sk.	8.4	11.2	12.6	18.9	21.0	23.0	28.9	30.9	33.5	34 20.93	− 0.78	. .	− 1.57	0 34 18.58	+67.77
16	28	Polaris	P.	13.0	19.0	12.0	35.0	59.0	28.0	54.0	47.0	49.0	13 1.78	+43.42	. .	− 2.36	1 13 42.84	− 0.60
	29	Lalande 4528 . .	P.	32.6	35.3	36.9	43.4	45.5	47.5	54.0	55.5	58.3	20 45.44	− 0.64	. .	− 2.37	2 20 42.43	− 3.55
	30	B. A. C. 765 . .	P.	37.0	40.0	41.9	49.2	51.8	54.4	1.9	3.7	6.7	22 51.84	− 1.63	. .	− 2.37	2 22 47.84	− 3.71
	31	B. A. C. 788 . .	P.	46.9	50.0	51.9	59.3	1.8	4.3	11.8	13.7	16.8	28 1.83	− 1.66	. .	− 2.37	2 27 57.80	− 3.70
	32	B. A. C. 818 . .	P.	14.2	17.4	19.5	27.3	29.9	32.5	40.4	42.2	45.6	33 29.89	− 1.75	. .	− 2.37	2 33 25.77	− 3.73
	33	γ Ceti.	P.	44.0	46.6	48.0	54.1	56.2	58.3	4.4	5.9	8.4	36 56.21	− 0.89	− 2.36	− 2.37	2 36 52.95	− 0.01
	34	B. A. C. 871 . .	P.	32.8	36.0	38.0	45.7	48.3	50.9	8.7	0.4	13.8	42 48.29	− 0.14	. .	− 2.37	2 42 45.78	− 3.91
	35	ρ^2 Arietis	P.	40.8	43.5	45.1	49 4	51.6	53 6	55.8	58.0	. .	48 53.68	− 0.61	. .	− 2.37	2 48 50.70	− 3.57
	36	ρ^3 Arietis	P.	. .	. .	. .	. .	. .	. .	38.0	39.5	42.2	49 29.35	− 0.61	. .	− 2.37	2 49 26.37	− 3.57
	37	α Ceti.	P.	39.2	41.7	43.3	49.3	51.4	53.5	59.7	1.2	3.8	55 51.46	− 0.82	− 2.38	− 2.37	2 55 48.27	+ 0.03
	38	B. A. C. 984 . .	P.	38.0	41.0	42.8	50.5	53.0	55.6	3.2	5.0	8.2	3 53.03	− 1.67	. .	− 2.37	3 3 48.99	− 3.52
	39	Moon II, N. . .	P.	0.8	3.7	5.4	12.3	14.6	16.8	23.7	25.3	28.2	30 14.53	− 0.50	. .	− 2.37	3 30 11.66	−75.04
17	40	B. A. C. 1341 . .	Sk.	52.6	55.5	57.0	3.8	6.0	8.4	15.2	16.8	19.7	15 6.11	− 0.50	. .	− 3.32	4 15 2.29	− 3.65
	41	62^2 Tauri	Sk.	. .	. .	. .	. .	. .	. .	44.0	45.7	48.5	16 35.06	− 0.53	. .	− 3.32	4 16 31.21	− 3.62
	42	Moon II, N. . .	Sk.	3.5	6.5	8.2	15.1	17.5	19.9	27.0	28.8	31.6	36 17.57	− 0.47	. .	− 3.32	4 36 13.79	−77.24
	43	ι Aurigæ. . . .	Sk.	44.0	47.1	48.9	56.2	58.7	1.3	8.5	10.2	13.3	48 58.69	− 0.32	− 3.33	− 3.34	4 48 55.03	− 0.05
	44	ε Ursæ Minoris, S.P.	Sk.	23.5	4.0	54.0	8.0	53.0	37.0	52.0	41.5	21.0	58 52.67	− 8.43	. .	− 3.34	16 58 40.90	− 0.27
	45	β Orionis. . . .	Sk.	27.0	29.6	31.0	37.3	39.3	41.4	47.5	49.1	51.7	8 39.32	− 1.11	− 3.41	− 3.34	5 8 34.87	+ 0.07
	46	β Tauri	Sk.	16.8	19.8	21.6	28.4	30.7	33.0	40.0	41.7	44.6	18 30.73	− 0.43	− 3.29	− 3.34	5 18 26.96	− 0.07
	47	δ Orionis. . . .	Sk.	32.3	34.9	36.5	42.4	44.5	46.5	52.6	54.1	56.7	25 44.50	− 0.98	− 3.28	− 3.34	5 25 40.18	− 0.09
	48	B. A. C. 1798 . .	Sk.	34.0	37.2	. .	. .	47.5	50.4	. .	. .	. .	34 50.18	− 1.81	. .	− 3.33	5 34 45.04	− 2.38
	49	B. A. C. 1825 . .	Sk.	14.1	17.5	19.5	27.3	30.0	32.6	40.5	42.5	45.8	39 29.98	− 1.77	. .	− 3.33	5 39 24.88	− 2.36
	50	δ Ursæ Minoris, S.P.	Sk.	. .	. .	. .	. .	. .	. .	19.0	53.5	8.0	12 36.74	−18.00	. .	− 3.34	18 12 15.40	− 0.63

3. Bisections at wires II and B3.
5, 10, 27, 39, 42, 44, 50. Bisections at sets B and D.
7. Bisections at set C.
15, 42. Wire B used.
20, 36. Wire A used.
50. Telescope micrometer reading increased one revolution in reduction.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan's Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	151 56	10 1.3	0.0	12.0	5.6	34	334	400	. .	. .	. .	30.6	151 59 53.5	. .	− 31.8	79 6 59.5	− 0.9
2	27 56	9 26.2	24.1	6.2	0.2	33	. .	. .	. .	. .	960	30.6	28 0 6.3	43.8	+ 31.8	79 6 59.3	− 0.1
3	77 8	29.3	27.3	6.3	3.2	34	130	052	. .	. .	. .	30.6	77 12 1.1	. .	+ 4 17.6	128 22 39.9	− 2.9
4	79 2	10 4.5	8.2	29.0	1.3	36	. .	916	. .	030	. .	30.6	79 5 15.2	. .	+ 5 1.4	130 16 37.8	− 3.2
5	79 30	3.1	0.4	9.5	5.9	31	. .	. .	. .	160	090	30.6	79 34 43.6	. .	+ 5 15.4	130 46 20.2	− 1.7
6	4 28	2.8	2.1	13.1	8.0	38	. .	. .	. .	328	380	30.6	4 30 51.8	. .	+ 4.7	55 37 17.7	+20.4
7	289 14	3.8	2.0	11.7	8.5	30	502	. .	. .	. .	561	30.6	289 18 50.9	. .	− 2 49.6	310 22 22.5	+ 1.2
8	55 6	3.5	28.9	10.4	5.3	30	. .	794	. .	765	. .	30.6	55 10 49.0	. .	+ 1 26.0	106 18 36.2	. .
9	55 6	3.5	28.9	10.4	5.3	3	970	. .	. .	. .	052	30.6	55 10 30.0	. .	+ 1 26.0	106 18 17.2	. .
10	328 6	9 28.7	27.0	8.4	4.5	35	. .	. .	. .	270	305	30.6	328 9 42.7	. .	− 37.2	19 15 26.7	− 0.3
11	76 36	10 1.9	27.5	8.8	5.0	33	. .	392	. .	490	. .	30.6	76 40 9.3	. .	+ 4 8.4	127 50 38.9	+ 3.6
12	78 54	6.9	3.6	10.6	12.2	36	290	306	. .	. .	. .	30.6	78 57 20.0	. .	+ 4 59.3	130 8 40.5	+ 3.9
13	72 22	6.9	28.8	8.8	4.4	32	. .	908	. .	050	. .	30.6	72 26 15.0	. .	+ 3 7.8	123 35 44.0	+ 6.0
14	54 58	0.9	27.5	10.5	5.0	36	940	034	. .	. .	. .	30.6	55 1 14.6	. .	+ 1 25.8	106 9 1.6	+12.0
15	53 56	0.5	27.6	8.2	2.6	35	. .	100	. .	204	. .	30.6	53 57 11.5	. .	+ 1 22.5	105 4 55.2	+12.5
16	28 38	9 28.9	26.4	7.5	3.0	34	. .	. .	. .	230	158	30.6	28 42 0.3	. .	+ 33.0	79 48 54.5	+ 1.4
17	72 18	10 0.8	26.3	7.5	3.5	31	740	870	. .	. .	. .	30.6	72 22 35.2	. .	+ 3 7.6	123 32 4.0	+10.2
18	69 4	1.6	28.5	10.2	5.0	34	. .	580	. .	642	. .	30.6	69 7 50.9	. .	+ 2 37.0	120 16 49.1	− 1.7
19	24 18	2.6	29.9	12.2	6.2	38	450	440	. .	. .	. .	30.6	24 20 51.2	. .	+ 27.3	75 27 39.7	+ 1.7
20	78 18	2.8	29.9	10.3	6.3	41	. .	. .	. .	022	100	30.6	78 22 44.1	. .	+ 4 46.0	129 33 51.3	+10.1
21	68 58	3.6	28.5	11.4	6.1	35	550	596	. .	. .	. .	30.6	69 1 34.7	. .	+ 2 36.7	120 10 32.6	+16.9
22	79 36	0.9	27.0	7.4	3.0	39	. .	596	. .	510	. .	30.6	79 38 36.9	. .	+ 5 20.7	130 50 18.8	+15.1
23	10 26	1.5	1.6	14.0	7.5	37	. .	660	. .	740	. .	30.6	10 29 1.7	. .	+ 11.2	61 35 34.1	+ 0.2
24	24 20	4.3	0.8	13.1	6.2	35	. .	780	. .	935	. .	30.6	24 23 29.8	. .	+ 27.5	75 30 18.5	+ 1.8
25	78 40	4.1	29.4	9.7	6.9	32	. .	434	. .	480	. .	30.6	78 44 22.6	. .	+ 4 56.2	129 55 40.0	+17.1
26	74 26	0.0	26.3	7.6	2.5	33	454	476	. .	. .	. .	30.6	74 30 10.2	. .	+ 3 35.7	125 40 7.1	+18.8
27	35 44	9 25.8	23.4	6.3	29.5	37	674	. .	970	. .	118	30.6	35 47 5.5	35.8	+ 43.7	86 54 10.4	. .
28	310 12	10 1.7	28.9	8.9	6.6	34	395	375	350	330	345	31.9	310 15 58.8	42.8	− 1 9.3	1 21 10.7	+ 3.8
29	22 44	9 29.6	27.3	9.5	3.7	34	420	430	. .	. .	. .	31.9	22 47 56.4	42.4	+ 24.8	73 54 42.4	+23.6
30	73 8	10 1.5	26.6	7.0	4.8	32	. .	835	. .	850	. .	31.9	73 12 20.6	. .	+ 3 12.7	124 21 54.5	+25.5
31	73 58	2.2	28.0	8.4	4.6	34	635	605	. .	. .	. .	31.9	74 1 52.1	. .	+ 3 23.0	125 11 36.3	+25.7
32	77 16	1.5	26.6	6.4	4.7	31	450	515	. .	. .	. .	31.9	77 20 41.1	. .	+ 4 16.5	128 31 18.8	+25.8
33	36 6	1.2	27.4	8.8	5.0	33	890	895	. .	950	955	31.9	36 10 3.7	. .	+ 43.0	87 17 7.9	+ 1.1
34	1 2	0.6	29.4	10.5	5.2	37	450	420	. .	435	475	31.9	1 5 9.3	. .	+ 1.1	52 11 31.6	+20.0
35	21 0	0.9	28.3	11.0	3.8	36	140	150	. .	. .	.	31.9	21 3 29.1	. .	+ 22.7	72 10 13.0	+22.6
36	21 16	2.2	29.3	11.3	5.5	38	. .	. .	. .	170	160	31.9	21 21 30.6	. .	+ 23.0	72 28 14.8	+22.6
37	35 12	0.1	26.3	7.9	2.9	31	505	530	. .	605	610	31.9	35 16 41.2	. .	+ 41.7	86 23 41.1	+ 1.1
38	74 40	1.7	27.4	8.5	5.1	33	770	730	. .	. .	. .	31.9	74 44 5.5	. .	+ 3 32.7	125 53 59.4	+26.9
39	15 54	9 27.8	24.2	6.0	1.5	33	540	. .	725	. .	915	31.9	15 58 9.9	41.9	+ 16.9	67 4 48.0	. .
40	13 30	10 1.4	28.7	10.7	4.8	37	. .	. .	. .	270	. .	31.7	13 33 11.9	. .	+ 14.2	64 39 47.3	+16.7
41	14 48	9 28.0	25.8	7.5	1.7	31	. .	. .	. .	858	880	31.7	14 52 37.9	. .	+ 15.3	65 59 14.4	+16.9
42	12 6	10 2.5	1.2	11.7	6.1	44	115	. .	200	. .	840	31.7	12 4 53.3	43.2	+ 12.6	63 11 27.1	. .
43	5 52	2.5	1.2	11.7	6 1	36	. .	. .	. .	410	416	31.7	5 55 23.8	. .	+ 6.1	57 1 51.1	+ 1.5
44	301 6	0.4	27.6	7.0	3.5	35	278	. .	. .	. .	290	31.7	301 9 43.4	. .	− 1 37.1	352 14 27.5	+ 2.6
45	47 10	3.6	0.0	11.5	6.4	37	. .	500	. .	570	. .	31.7	47 13 5.9	. .	+ 1 3.6	98 20 30.7	+ 1.0
46	10 20	2.3	0.5	11.5	5.6	36	. .	690	. .	714	. .	31.7	10 23 19.2	. .	+ 10.8	61 29 51.2	+ 1.0
47	39 12	2.5	29.5	10.5	4.3	33	. .	503	. .	470	. .	31.7	39 16 9.1	. .	+ 48.2	90 23 18.5	+ 0.9
48	79 30	3.9	29.8	10.2	6.0	31	. .	114	. .	. .	. .	31.7	79 34 44.1	. .	+ 5 10.3	130 46 15.6	+27.0
49	78 12	5.0	1.6	11.0	7.6	32	. .	368	. .	347	. .	31.7	78 16 24.0	. .	+ 4 36.8	129 27 22.0	+26.7
50	305 28	9 29.6	27.9	8.9	4.7	34	. .	. .	. .	419	401	31.7	305 31 40.2	. .	− 1 22.5	356 36 38.9	+ 2.1

No.	Barom.	At. Ther.
	in.	°
2	30.37	47.4
27	30.34	41.0
28	29.81	44.7
29	29.84	44.4
39	29.87	43.7
42	29.88	45.8

For summary of the elements of reduction see page 3.

No	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
8	− 0.8	− 9.5	. .	− 10.3
9	− 0.8	+ 9.5	. .	+ 8.7
27	−34 44.0	− 16 18.3	. .	− 51 2.3
39	−16 27.9	+ 16 32.6	. .	+ 4.6
42	−12 25.5	+ 16 28.3	. .	+ 4 2.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Oct. 17	1	γ Geminorum	Sk.	23.7	26.3	28.0	34.3	36.4	38.5	44.9	46.6	49.2	30 36.43	− 0.68	− 3.33	− 3.34	6 30 32.41	− 0.04
	2	B. A. C. 2202	Sk.	0.6	4.0	5.9	13.9	16.6	19.3	27.3	29.2	32.8	37 16.62	− 1.79	. .	− 3.34	6 37 11.49	− 1.84
	3	B. A. C. 2214	Sk.	35.8	38.8	40.6	47.8	50.1	52.4	59.5	1.4	4.5	39 50.10	− 1.56	. .	− 3.34	6 39 45.20	− 2.03
	4	B. A. C. 2252	Sk.	11.7	14.7	16.5	21.5	23.9	26.5	29.0	31.4	. .	46 26.46	− 1.64	. .	− 3.34	6 46 21.48	− 1.91
	5	B. A. C. 2258	Sk.	. .	. .	22.3	24.7	27.4	29.9	35.0	36.6	40.0	47 24.80	− 1.68	. .	− 3.34	6 47 19.78	− 1.86
	6	δ Canis Majoris	Sk.	. .	. .	20.7	23.0	25.4	27.5	29.9	. .	. .	3 25.30	− 1.45	− 3.35	− 3.34	7 3 20.51	− 0.04
	7	B. A. C. 2355	Sk.	30.0	33.3	35.4	43.3	46.0	48.7	56.6	58.6	2.0	4 45.99	− 1.77	. .	− 3.35	7 4 40.87	− 1.63
	8	δ Geminorum	Sk.	33.0	35.7	37.4	41.9	44.0	46.2	48.4	50.6	. .	12 46.22	− 0.56	− 3.38	− 3.34	7 12 42.32	− 0.02
	9	B. A. C. 2422	Sk.	. .	. .	. .	. .	. .	. .	8.5	10.4	13.8	13 58.42	− 1.69	. .	− 3.35	7 13 53.38	− 1.64
	10	B. A. C. 2425	Sk.	. .	. .	. .	15.7	18.2	20.8	23.4	. .	. .	14 18.26	− 1.69	. .	− 3.35	7 14 13.22	− 1.64
19	11	B. A. C. 881	F.	30.0	32.5	34.1	40.5	42.5	44.6	51.0	52.6	55.2	44 42.56	− 0.61	. .	− 2.69	2 44 39.26	− 3.59
	12	α Ceti	F.	. .	. .	47.7	49.8	51.9	54.0	56.0	. .	. .	55 51.88	− 0.78	− 2.79	− 2.69	2 55 48.41	+ 0.12
	13	B. A. C. 994	F.	18.6	21.0	22.7	28.7	30.9	32.8	38.9	40.5	43.0	6 30.79	− 0.87	. .	− 2.68	3 6 27.24	− 3.46
	14	B. A. C. 1003	F.	. .	. .	. .	. .	. .	. .	25.5	27.4	30.6	8 15.37	− 1.50	. .	− 2.68	3 8 11.19	− 3.54
	15	B. A. C. 1034	F.	. .	3.3	5.5	7.6	9.8	12.0	16.3	17.9	20.7	14 7.61	− 0.50	. .	− 2.68	3 14 4.43	− 3.66
	16	B. A. C. 1052	F.	49.2	52.0	53.7	0.4	2.6	4.9	11.6	13.2	16.2	17 2.64	− 0.44	. .	− 2.68	3 16 59.52	− 3.72
	17	B. A. C. 1092	F.	44.9	47.3	48.9	55.1	57.2	59.3	5.5	7.0	9.6	25 57.20	− 0.70	. .	− 2.68	3 25 53.82	− 3.51
	18	δ Persei	F.	. .	. .	2.8	5.9	8.9	11.9	15.0	. .	. .	34 8.90	+ 0.14	. .	− 2.69	3 34 6.35	+ 0.15
	19	B. A. C. 1149	F.	35.8	38.6	40.2	47.0	49.2	51.4	58.2	59.9	2.7	37 49.22	− 0.43	. .	− 2.68	3 37 46.11	− 3.72
	20	B. A. C. 1212	F.	26.0	28.5	30.0	36.1	38.3	40.3	46.5	48.0	50.6	46 38.26	− 0.93	. .	− 2.68	3 46 34.65	− 3.34
	21	B. A. C. 1216[1]	F.	55.5	58.3	59.7	. .	. .	. .	16.0	17.5	20.1	48 7.85	− 0.90	. .	− 2.68	3 48 4.27	− 3.35
	22	B. A. C. 1216[2]	F.	. .	. .	3.9	5.9	7.9	10.0	12.0	. .	. .	48 7.94	− 0.90	. .	− 2.68	3 48 4.36	− 3.35
	23	B. A. C. 1221	F.	. .	. .	. .	. .	. .	. .	44.6	46.2	49.0	49 35.79	− 0.48	. .	− 2.68	3 49 32.63	− 3.66
	24	B. A. C. 1302	F.	34.8	37.4	38.9	43.2	47.4	51.7	55.9	57.5	0.1	8 47.43	− 0.60	. .	− 2.67	4 8 44.16	− 3.51
	25	B. A. C. 1361	F.	. .	. .	. .	47.0	49.2	51.3	55.5	57.2	59.9	17 46.91	− 0.54	. .	− 2.67	4 17 43.70	− 3.56
	26	ε Tauri	F.	15.7	17.2	21.6	23.7	25.9	28.0	30.2	34.6	36.0	21 25.88	− 0.54	− 2.66	− 2.68	4 21 22.66	− 0.03
	27	B. A. C. 1442	F.	0.1	2.9	4.3	. .	. .	. .	21.0	22.7	25.2	33 12.70	− 0.65	. .	− 2.67	4 33 9.38	− 3.40
	28	B. A. C. 1453	F.	33.1	35.9	37.5	44.3	46.5	48.7	55.5	57.1	0.1	35 46.52	− 0.44	. .	− 2.67	4 35 43.41	− 3.63
	29	B. A. C. 1460	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	30	ι Aurigæ	F.	43.4	46.4	48.1	55.7	58.1	0.5	7.8	9.5	12.9	48 58.04	− 0.26	− 2.68	− 2.68	4 48 55.10	− 0.04
	31	B. A. C. 1528	F.	. .	. .	32.8	35.0	37.2	39.5	41.8	. .	. .	50 37.26	− 0.42	. .	− 2.67	4 50 34.17	− 3.62
	32	Lalande 9335	F.	. .	. .	54.2	56.3	58.5	0.5	2.6	. .	. .	51 58.42	− 0.61	. .	− 2.67	4 51 55.14	− 3.40
	33	B. A. C. 1537	F.	. .	. .	. .	. .	. .	. .	9.0	10.6	13.5	52 0.66	− 0.61	. .	− 2.67	4 51 57.38	− 3.39
	34	B. A. C. 1627	F.	50.7	53.7	55.5	0.3	2.8	5.3	7.8	10.2	. .	10 5.26	− 0.25	. .	− 2.66	5 10 2.35	− 3.80
	35	Weisse (2) 245	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	36	Weisse (2) 247	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	37	O. Arg. S. 3957	F.	56.2	59.0	0.7	7.4	9.5	11.6	18.0	19.7	22.7	21 9.42	− 1.18	. .	− 2.66	5 21 5.58	− 2.78
	38	β Leporis	F.	47.0	49.8	51.4	57.9	0.1	2.3	9.0	10.4	13.2	23 0.12	− 1.18	. .	− 2.66	5 22 56.28	− 2.77
	39	B. A. C. 1845	F.	40.4	43.8	45.8	53.6	56.4	58.8	6.9	8.7	12.0	42 56.27	− 0.11	. .	− 2.66	5 42 53.50	− 3.91
	40	B. A. C. 1900	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	41	B. A. C. 1989	F.	44.5	47.0	48.7	55.0	57.1	59.2	5.6	7.2	10.0	4 57.14	− 0.58	. .	− 2.66	6 4 53.90	− 3.16
	42	B. A. C. 2016	F.	14.2	17.0	18.7	25.4	27.5	29.9	36.5	38.3	41.0	9 27.61	− 0.44	. .	− 2.65	6 9 24.52	− 3.32
	43	δ Ursæ Minoris, S. P.	F.	. .	. .	42.5	8.0	33.0	59.0	25.0	. .	. .	12 33.50	−16.05	. .	− 2.68	18 12 14.77	− 0.81
	44	μ Geminorum	F.	17.1	19.8	21.4	28.0	30.2	32.4	39.1	40.9	43.6	15 30.28	− 0.47	− 2.65	− 2.68	6 15 27.13	− 0.07
	45	B. A. C. 2064	F.	50.0	52.8	54.5	1.1	3.4	5.7	12.4	14.0	16.8	18 3.41	− 0.45	. .	− 2.65	6 18 0.31	− 3.28
	46	B. A. C. 2134	F.	10.0	12.7	14.3	20.9	23.0	25.1	31.6	33.0	36.0	27 22.96	− 0.52	. .	− 2.65	6 27 19.79	− 3.14
	47	γ Geminorum	F.	23.0	25.6	27.2	33.5	35.7	37.8	44.1	45.8	48.5	30 35.69	− 0.58	− 2.62	− 2.68	6 30 32.43	− 0.09
	48	B. A. C. 2184	F.	. .	. .	. .	. .	17.7	19.8	24.0	25.6	28.3	34 15.51	− 0.58	. .	− 2.65	6 34 12.28	− 3.04
	49	51 Cephei	F.	. .	12.0	41.0	. .	. .	. .	. .	. .	. .	41 32.07	+17.79	. .	− 2.68	6 41 47.18	− 0.16
	50	α Canis Majoris	F.	. .	. .	. .	. .	46.7	48.8	53.0	54.6	57.3	39 44.51	− 1.11	− 2.85	− 2.68	6 39 40.72	+ 0.09

23. Wire A used.
44. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	22 18	10 5.0	2.5	14.5	7.7	30	. .	400	. .	430	. .	31.7	22 22 53.0	. .	+ 24.3	73 29 38.5	+ 2.9
2	78 58	5.4	0.8	11.2	7.7	32	152	138	. .	. .	. .	31.7	79 2 11.5	. .	+ 4 56.1	130 13 28.8	+24.3
3	69 44	1.3	26.3	7.0	3.0	36	. .	930	. .	930	. .	31.7	69 47 18.5	. .	+ 2 39.2	120 56 18.9	+22.5
4	73 0	6.2	1.5	12.0	9.5	36	350	370	. .	. .	. .	31.7	73 3 21.3	. .	+ 3 11.5	124 12 54.0	+22.8
5	74 50	7.2	11.6	1.5	6.9	32	. .	. .	. .	250	258	31.7	74 54 25.3	. .	+ 3 35.7	126 4 22.2	+23.0
6	65 0	3.7	29.0	11.6	6.0	37	935	980	. .	. .	. .	31.7	65 2 59.1	. .	+ 2 6.4	116 11 26.7	+ 2.4
7	78 12	5.6	2.7	11.7	9.7	33	. .	. .	. .	800	806	31.7	78 16 0.9	. .	+ 4 37.4	129 26 59.5	+22.6
8	16 36	2.5	0.6	12.8	5.5	31	326	390	. .	. .	. .	31.7	16 40 40.4	. .	+ 17.7	67 47 19.3	+ 2.0
9	75 16	2.8	27.9	8.8	5.3	33	. .	. .	. .	900	920	31.7	75 20 3.0	. .	+ 3 42.3	126 30 6.5	+21.4
10	75 16	2.8	27.9	8.8	5.3	32	. .	. .	. .	. .	238	31.7	75 20 28.6	41.0	+ 3 42.4	126 30 32.2	+21.4
11	24 16	9 29.0	26.9	8.3	3.3	38	. .	. .	. .	712	730	32.3	24 18 52.3	36.2	+ 27.3	75 25 40.8	+23.3
12	35 12	29.5	26.4	7.7	3.1	31	. .	. .	. .	696	720	32.3	35 16 39.7	. .	+ 42.7	86 23 43.6	+ 0.6
13	40 28	24.3	19.6	2.7	27.7	33	. .	524	. .	558	. .	32.3	40 32 16.9	. .	+ 51.6	91 39 29.7	+24.4
14	75 10	28.1	23.0	4.3	1.3	33	. .	. .	. .	686	700	32.3	75 14 11.4	. .	+ 3 45.6	126 24 18.2	+26.4
15	18 8	26.2	23.2	5.5	0.5	37	. .	. .	. .	420	404	32.3	18 11 15.4	. .	+ 19.8	69 17 56.4	+21.3
16	14 32	26.2	23.2	27.4	0.8	33	. .	452	. .	458	. .	32.3	14 36 17.6	. .	+ 15.7	65 42 54.5	+20.6
17	29 52	29.0	26.6	8.7	3.8	35	. .	325	. .	345	. .	32.3	29 55 43.6	. .	+ 34.8	81 2 39.6	+22.6
18	351 26	26.0	25.1	6.0	1.4	32	. .	720	. .	824	. .	32.3	351 30 25.5	. .	— 8.8	42 36 37.9	+ 1.2
19	14 22	29.7	26.4	8.3	3.1	32	820	820	. .	. .	. .	32.3	14 26 22.1	. .	+ 15.6	65 32 58.9	+19.4
20	44 32	27.9	24.5	6.0	1.8	32	734	738	. .	. .	. .	32.3	44 36 24.9	. .	+ 59.5	95 43 45.6	+24.0
21	42 8	27.7	22.4	4.2	29.5	35	. .	420	. .	428	. .	32.3	42 11 45.7	. .	+ 54.7	93 19 1.6	+23.7
22	42 8	27.7	22.4	4.2	29.5	34	. .	866	. .	994	. .	32.3	42 11 52.5	. .	+ 54.7	93 19 8.4	+23.7
23	16 40	28.5	26.1	8.1	2.4	36	. .	. .	. .	188	218	32.3	16 46 4.4	. .	+ 18.2	67 52 43.8	+19.2
24	23 44	26.8	24.3	6.1	1.6	35	444	466	. .	. .	. .	32.3	23 47 43.8	35.7	+ 26.6	74 54 31.6	+19.5
25	20 4	24.8	22.5	5.3	29.0	35	. .	. .	. .	444	452	32.3	20 7 46.4	. .	+ 22.2	71 14 29.8	+18.2
26	19 56	29.7	27.5	10.0	3.6	38	. .	. .	. .	452	462	32.3	19 58 55.5	. .	+ 22.0	71 5 38.7	+ 2.3
27	26 52	10 2.6	28.7	10.0	5.4	34	. .	775	. .	798	. .	32.3	26 55 49.8	. .	+ 30.7	78 2 41.7	+18.8
28	14 58	1.4	29.4	10.5	5.9	33	580	590	. .	. .	. .	32.3	15 2 7.9	. .	+ 16.2	66 8 45.3	+15.7
29	27 54	6.7	4.1	15.7	10.6	33	. .	. .	. .	298	298	32.3	27 58 7.9	. .	+ 32.1	79 5 1.2	+18.8
30	5 52	6.6	3.9	15.3	8.6	36	226	236	. .	. .	. .	32.3	5 55 23.2	. .	+ 6.3	56 1 50.7	+ 1.2
31	13 58	2.0	28.0	8.5	4.4	34	754	762	. .	. .	. .	32.3	14 1 51.0	. .	+ 15.1	65 8 27.3	+14.4
32	24 28	9 23.7	22.1	3.8	29.0	34	. .	. .	. .	846	. .	32.3	24 31 56.2	. .	+ 27.6	75 38 45.0	+17.1
33	24 28	23.7	22.1	3.8	29.0	36	. .	. .	. .	. .	328	32.3	24 31 33.8	. .	+ 27.6	75 38 22.6	+17.0
34	5 36	28.2	25.4	7.8	2.1	38	060	072	. .	. .	. .	32.3	5 39 2.8	. .	+ 6.0	56 45 30.0	+10.6
35	5 26	26.4	24.1	5.7	2.3	34	. .	. .	. .	114	120	32.3	5 30 5.2	. .	+ 5.8	56 36 32.2	+10.5
36	5 26	26.4	24.1	5.7	2.3	35	. .	. .	. .	002	998	32.3	5 29 51.7	. .	+ 5.8	56 36 18.7	+10.5
37	59 38	10 0.7	27.6	10.6	5.2	37	. .	828	. .	838	. .	32.3	59 41 3.6	. .	+ 1 43.2	110 49 8.0	+23.9
38	59 38	0.7	27.6	10.6	5.2	29	562	578	. .	. .	. .	32.3	59 43 9.7	34.8	+ 1 43.4	110 51 14.3	+23.8
39	339 44	. .	. .	. .	. .	.	. . .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
40	1 38	9 23.3	21.1	3.9	29.0	36	785	893	. .	. .	. .	32.3	1 41 25.7	. .	+ 1.8	52 47 48.7	+ 5.8
41	22 40	29.9	26.1	8.9	3.3	35	644	660	. .	. .	. .	32.3	22 43 38.4	. .	+ 25.3	73 50 24.9	+11.4
42	15 2	10 0.0	27.0	9.2	3.8	32	726	740	. .	. .	. .	32.3	15 6 22.8	. .	+ 16.3	66 13 0.3	+ 8.6
43	305 28	9 23.1	20.0	2.1	29.8	35	. .	. .	905	. .	. .	32.3	305 31 40.5	. .	— 1 24.6	356 36 37.1	+ 0.5
44	16 16	10 3.6	1.3	13.0	8.8	39	. .	044	. .	058	. .	32.3	16 18 42.0	. .	+ 17.7	67 25 20.9	+ 2.0
45	15 26	1.5	29.3	10.6	5.4	35	. .	. .	. .	656	660	32.3	15 29 37.0	. .	+ 16.8	66 36 15.0	+ 8.0
46	19 18	9 29.5	26.3	9.0	2.9	35	. .	150	. .	174	. .	32.3	19 21 46.4	. .	+ 21.2	70 28 28.8	+ 8.5
47	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
48	22 18	10 0.1	27.2	9.4	3.4	32	. .	830	. .	840	. .	32.3	22 22 21.4	35.2	+ 24.9	73 29 7.5	+ 9.0
49	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	35.2	. .	. . . .	. .
50	55 20	2.5	28.5	10.9	6.9	31	. .	. .	. .	254	266	32.3	55 24 43.4	. .	+ 1 27.6	106 32 32.2	+ 2.5

No.	Barom.	At. Ther.
	in.	°
10	29.88	44.0
11	30.20	40.0
24	30.20	39.5
38	30.20	38.4
48	30.21	38.2
49	30.21	38.2

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Oct. 19	1	B. A. C. 2228	F.	31.6	34.2	35.9	42.1	44.3	46.5	52.9	54.4	57.1	42 44.33	— 0.58	. .	— 2.65	6 42 41.10	— 2.99
	2	Moon II, S.	F.	31.3	33.1	37.9	40/2	42.6	45.0	47.5	52.1	53.9	52 42.62	— 0.37	. .	— 2.65	6 52 39.60	—76.83
	3	B. A. C. 2493	F.	. .	. .	14.5	16.7	19.0	21.4	23.8	. .	. .	28 19.08	— 0.38	. .	— 2.64	7 28 16.06	— 3.02
	4	B. A. C. 2506	F.	33.0	35.7	37.5	44.2	46.4	48.8	55.5	57.2	59.8	30 46.46	— 0.43	. .	— 2.64	7 30 43.39	— 2.94
	5	α Canis Minoris	F.	. .	. .	49.3	51.3	53.3	55.4	59.6	1.0	3.7	32 51.32	— 0.76	— 2.70	— 2.68	7 32 47.88	— 0.14
	6	β Geminorum	F.	. .	. .	. .	. .	. .	50.5	55.0	57.0	59.7	37 45.82	— 0.36	— 2.62	— 2.68	7 37 42.78	— 0.09
	7	φ Geminorum	F.	42.8	45.7	47.4	54.1	56.7	59.0	5.8	7.3	10.5	45 56.59	— 0.38	— 2.60	— 2.68	7 45 53.53	— 0.16
	8	B. A. C. 2653	F.	45.2	47.7	49.4	55.5	57.7	59.6	5.7	7.2	9.8	51 57.53	— 0.80	. .	— 2.64	7 51 54.09	— 2.33
	9	B. A. C. 2659	F.	30.5	33.0	34.7	41.0	43.2	45.4	51.7	53.3	56.0	53 43.20	— 0.56	. .	— 2.64	7 53 40.00	— 2.64
	10	B. A. C. 2720	F.	36.3	39.0	40.6	46.9	48.9	51.0	57.4	59.0	1.6	1 48.97	— 0.62	. .	— 2.64	8 1 45.71	— 2.51
	11	B. A. C. 2788	F.	56.0	58.7	0.5	7.0	9.3	11.5	18.0	19.6	22.2	13 9.20	— 0.49	. .	— 2.63	8 13 6.08	— 2.60
	12	B. A. C. 2799	F.	. .	. .	13.8	15.9	18.1	20.2	22.3	. .	. .	16 18.06	— 0.54	. .	— 2.63	8 16 14.89	— 2.53
	13	12 Canum Venat.	Sk.	58.5	1.8	3.8	11.6	14.3	17.0	24.9	26.7	30.0	50 14.29	— 0.02	— 2.58	— 2.55	12 50 11.72	+ 0.03
	14	Polaris, S. P.	P.	. .	. .	23.0	58.0	30.0	3.0	38.0	. .	. .	14 30.40	—45.86	. .	— 2.55	1 13 41.99	— 1.73
20	15	Sun I, N.	P.	34.6	37.2	38.6	44.9	47.0	49.0	55.5	56.7	59.5	38 47.00	— 1.03	. .	— 2.55	13 38 43.42	. .
	16	Sun II, S.	P.	45.5	48.3	49.8	56.0	58.1	0.2	6.6	7.9	10.7	40 58.12	— 1.03	. .	— 2.55	13 40 54.54	. .
	17	Venus I, N.	P.	11.7	14.3	17.9	22.1	24.3	26.2	32.7	34.3	36.9	8 24.27	— 1.06	. .	— 2.55	14 8 20.66	+ 0.31
	18	Venus, S.	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	19	ε Bootis	P.	21.5	24.5	26.2	33.2	35.4	37.7	44.7	46.3	49.3	39 35.42	— 0.32	— 2.64	— 2.55	14 39 32.55	+ 0.07
	20	μ¹ Bootis	P.	33.7	37.0	38.9	46.7	49.3	51.9	59.5	1.5	4.7	19 49.24	— 0.06	— 2.55	— 2.55	15 19 46.63	— 0.01
	21	α Coronæ Borealis	P.	13.6	16.5	18.2	25.1	27.4	29.7	36.5	38.2	41.1	29 27.37	— 0.33	— 2.53	— 2.55	15 29 24.49	— 0.02
	22	α Serpentis	P.	58.7	1.2	2.9	7.0	11.0	15.3	19.3	20.7	23.4	38 11.04	— 0.73	— 2.54	— 2.55	15 38 7.76	+ 0.01
	23	γ Aquilæ	P.	11.8	14.3	15.9	22.0	24.2	26.3	32.6	34.2	36.7	40 24.22	— 0.70	— 2.53	— 2.55	19 40 20.97	+ 0.01
	24	α Aquilæ	P.	34.0	36.6	38.2	44.3	46.4	48.5	54.7	56.3	58.8	44 46.42	— 0.73	— 2.56	— 2.55	19 44 43.14	+ 0.05
	25	λ Ursæ Minoris	P.	25.0	43.0	. .	. .	22.0	10.0	. .	. .	25.0	47 23.49	+54.74	. .	— 2.55	19 48 15.68	+ 0.68
	26	XIX, 17	P.	36.3	39.5	41.4	48.8	51.3	53.7	1.4	3.3	6.3	51 51.33	— 1.56	. .	— 2.52	19 51 47.25	— 3.05
	27	B. A. C. 6860	P.	48.8	51.9	54.0	1.7	4.3	6.9	14.7	16.6	20.0	53 4.32	— 0.09	. .	— 2.52	19 53 1.71	— 1.32
	28	Bonn VI, +38°, 3836	P.	. .	. .	. .	. .	. .	. .	24.9	26.9	30.3	53 14.55	— 0.09	. .	— 2.52	19 53 11.94	— 1.33
	29	Mars I, S.	P.	26.2	28.9	30.7	37.0	39.4	41.8	48.3	49.9	52.9	2 39.46	— 1.29	. .	— 2.52	20 2 35.65	+ 0.38
	30	α² Capricorni	P.	0.9	3.4	5.0	11.3	13.4	15.4	21.8	23.3	25.9	11 13.38	— 1.10	— 2.59	— 2.55	20 11 9.73	+ 0.08
	31	π Capricorni	P.	3.6	6.4	7.9	14.3	16.4	18.5	25.3	26.7	29.4	20 16.50	— 1.21	— 2.61	— 2.55	20 20 12.74	+ 0.09
	32	ε Delphini (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	33	ε Delphini	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	34	ν Cygni	P.	19.0	22.3	24.4	32.5	35.0	37.9	45.7	47.7	51.3	52 35.09	— 0.01	- 2.56	— 2.55	20 52 32.53	+ 0.07
	35	σ² Ursæ Majoris, S.P.	P.	4.2	57.4	53.4	37.6	32.4	27.0	10.4	6.8	59.8	59 32.11	— 3.45	. .	— 2.55	8 59 26.11	— 0.07
	36	Transit Zones 176, 4	P.	47.3	49.8	51.5	55.8	58.1	0.4	. .	. .	. .	8 0.35	— 1.28	. .	— 2.51	21 7 56.56	— 3.15
	37	α Cephei (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	38	α Cephei	P.	. .	. .	. .	. .	42.8	47.0	55.7	59.0	4.5	15 38.29	+ 1.05	. .	— 2.55	21 15 36.79	0.00
	39	Saturn I, N.	P.	0.8	3.3	4.9	. .	. .	. .	21.9	23.4	26.4	29 13.45	— 1.17	. .	— 2.51	21 29 9.77	. .
	40	Saturn II, S.	P.	. .	. .	10.3	12.5	14.5	16.7	19.0	. .	. .	29 14.60	— 1.17	. .	— 2.51	21 29 10.92	. .
	41	ε Pegasi	P.	56.4	59.0	0.5	6.6	8.7	10.7	17.0	18.5	21.1	38 8.72	— 0.72	— 2.53	— 2.55	21 38 5.45	— 0.01
	42	B. A. C. 7826	P.	11.7	14.9	16.8	24.9	27.6	30.3	38.3	40.2	43.5	21 27.58	— 1.69	. .	— 2.51	22 21 23.38	— 4.06
	43	η Aquarii	P.	50.4	52.9	54.5	0.5	2.5	4.5	10.6	12.2	14.7	29 2.53	— 0.89	— 2.61	— 2.55	22 28 59.09	+ 0.09
	44	B. A. C. 7895	P.	17.0	20.0	21.8	29.0	31.4	33.8	41.0	42.7	45.8	33 31.39	— 1.47	. .	— 2.50	22 33 27.42	— 3.78
	45	B. A. C. 7909	P.	18.4	21.3	23.1	30.2	32.4	34.9	42.0	43.5	46.6	35 32.49	— 1.44	. .	— 2.50	22 35 28.55	— 3.75
	46	α Piscis Australis	P.	38.0	41.0	42.9	49.7	52.2	54.6	1.7	3.6	6.4	50 52.23	— 1.45	— 2.54	— 2.55	22 50 48.23	+ 0.03
	47	α Pegasi (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	α Pegasi	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	49	ψ¹ Aquarii	P.	15.1	17.7	19.2	25.3	27.4	29.6	35.7	37.3	40.0	9 27.48	— 1.05	. .	— 2.50	23 9 23.93	— 3.37
	50	ω Piscium	P.	48.0	50.5	52.0	58.0	0.1	2.3	8.4	9.9	12.4	53 0.18	— 0.77	— 2.50	— 2.55	23 52 56.86	— 0.04

22. Sun shining on barometer.
28, 36. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° '	r. "	"	"	"							"	° ' "	°	' "	° ' "	"
1	22 28	9 25.7	24.0	6.1	0.2	32	. .	. .	. .	390	400	32.3	22 32 32.0	. .	+ 25.1	73 39 18.3	+ 8.4
2	11 4	28.2	25.9	7.3	2.5	31	. .	670	684	634	. .	32.3	11 8 40.9	. .	+ 11.9	62 15 14.0	. .
3	11 40	25.1	21.6	4.6	29.2	38	. .	. .	. .	088	084	32.3	11 43 6.4	. .	+ 12.6	62 49 40.2	+ 1.0
4	14 12	10 1.2	29.1	10.5	5.4	37	. .	854	. .	868	. .	32.3	14 15 2.9	. .	+ 15.4	65 21 39.5	+ 1.7
5	33 16	25.5	22.8	4.4	0.5	33	. .	. .	. .	578	594	32.3	33 20 14.0	. .	+ 39.8	84 27 15.0	− 0.7
6	10 30	9 14.6	12.6	24.9	21.3	35	. .	. .	. .	676	686	32.3	10 33 52.5	. .	+ 11.3	61 40 25.0	− 0.3
7	11 44	10 0.4	28.1	10.5	4.4	33	. .	432	. .	432	. .	32.3	11 48 11.5	35.5	+ 12.6	62 54 45.3	0.0
8	36 16	9 29.6	26.5	6.9	3.0	36	. .	676	. .	700	. .	32.3	36 19 23.3	. .	+ 44.4	87 26 28.9	+ 7.8
9	21 10	10 2.6	0.9	11.8	5.7	33	. .	. .	. .	064	080	32.3	21 14 15.4	. .	+ 23.5	72 21 0.1	+ 2.4
10	24 50	1.4	29.1	10.2	4.9	38	. .	. .	. .	274	290	32.3	24 52 57.0	. .	+ 28.0	75 59 46.2	+ 3.1
11	17 40	1.7	0.0	10.8	5.2	30	408	516	. .	. .	. .	32.3	17 44 55.6	. .	+ 19.4	68 51 36.2	− 0.3
12	20 6	9 27.3	24.4	7.0	1.0	36	. .	. .	. .	930	946	32.3	20 9 21.6	35.5	+ 22.2	71 16 5.0	− 0.3
13	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
14	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
15	48 56	10 2.7	29.5	11.4	5.3	37	820	845	. .	. .	. .	29.9	48 59 0.2	. .	+ 1 7.0	100 6 28.4	. .
16	49 28	9 27.0	24.2	6.5	2.0	37	. .	. .	. .	415	480	29.9	49 31 10.6	53.5	+ 1 8.3	100 38 40.1	. .
17	50 58	10 1.8	27.0	10.0	3.8	30	250	. .	. .	. .	110	29.9	51 2 58.8	. .	+ 1 11.9	102 10 31.9	. .
18	50 58	1.8	27.0	10.0	3.8	29	. .	620	. .	555	. .	29.9	51 3 7.9	. .	+ 1 11.9	102 10 41.0	. .
19	11 14	9 28.9	27.0	9.7	3.1	35	. .	990	. .	040	. .	29.9	11 17 30.7	. .	+ 11.6	62 24 3.5	+ 3.0
20	1 0	29.4	27.0	9.4	4.0	31	. .	. .	. .	030	. .	29.9	1 4 47.1	57.0	+ 1.1	52 11 9.4	+ 3.0
21	11 42	29.5	27.0	9.8	4.0	36	. .	415	. .	470	. .	29.9	11 45 23.8	. .	+ 12.0	62 51 57.0	+ 3.1
22	32 0	27.5	25.0	7.0	1.5	34	. .	160	. .	260	. .	29.9	32 4 0.2	57.1	+ 36.2	83 10 57.6	+ 3.8
23	28 30	27.5	25.2	5.8	1.7	32	750	710	. .	. .	. .	30.6	28 34 23.4	. .	+ 31.8	79 41 16.4	+ 1.8
24	30 16	10 0.9	27.5	7.5	2.8	31	840	810	. .	. .	. .	30.6	30 20 35.1	. .	+ 34.2	81 27 30.5	+ 2.4
25	309 54	9 27.9	25.6	5.5	3.1	31	. .	. .	595	550	. .	30.6	309 58 41.0	. .	− 1 9.6	1 3 52.6	+ 1.3
26	73 48	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
27	0 42	27.9	26.2	7.0	1.6	34	. .	. .	. .	210	245	30.6	0 46 0.8	. .	+ 0.8	51 52 22.8	+16.2
28	0 42	27.9	26.2	7.0	1.6	30	. .	. .	. .	. .	750	30.6	0 49 27.1	. .	+ 0.8	51 55 49.1	+16.2
29	61 46	28.5	25.5	7.0	2.6	33	. .	755	. .	830	. .	30.6	61 50 6.4	. .	+ 1 48.8	112 58 16.4	. .
30	51 44	10 2.3	28.7	8.9	4.8	33	. .	190	. .	195	. .	30.6	51 48 12.8	. .	+ 1 14.3	102 55 48.3	+ 1.5
31	57 26	9 25.3	23.3	4.1	29.8	37	. .	. .	. .	255	245	30.6	57 29 16.5	. .	+ 1 31.6	108 37 9.3	+ 0.4
32	151 56	28.6	26.5	7.2	3.2	34	680	730	. .	. .	. .	30.6	151 59 51.6	. .	− 31.2	79 7 0.8	+ 0.4
33	27 56	10 0.7	28.0	8.7	4.4	33	. .	. .	. .	480	300	30.6	28 0 11.0	. .	+ 31.2	79 7 3.4	+ 3.0
34	358 8	9 29.8	27.0	7.2	3.0	33	520	545	. .	. .	. .	30.6	358 12 9.8	48.6	− 1.8	49 18 29.2	+ 3.9
35	286 32	10 1.7	27.4	8.0	5.5	38	. .	010	. .	890	. .	30.6	286 34 59.8	. .	− 3 14.5	337 38 6.5	+ 3.2
36	61 6	9 28.5	25.0	6.9	2.6	37	642	622	. .	. .	. .	30.6	61 11 40.3	. .	+ 1 46.3	112 19 47.8	+ 4.2
37	203 6	10 3.2	1.7	9.9	4.6	34	. .	880	. .	. .	. .	30.6	203 9 45.0	. .	+ 25.1	27 56 11.1	− 3.1
38	336 46	0.6	28.2	7.2	4.5	32	. .	. .	. .	990	045	30.6	336 50 18.0	. .	− 25.1	27 56 14.1	− 0.1
39	55 8	2.3	28.5	9.3	5.3	35	. .	. .	. .	. .	305	30.6	55 11 40.6	48.9	+ 1 24.2	106 19 26.0	. .
40	55 8	2.3	28.5	9.3	5.3	34	. .	175	. .	195	. .	30.6	55 11 57.5	. .	+ 1 24.2	106 19 42.9	. .
41	29 30	0.4	26.9	7.8	3.4	31	520	505	. .	. .	. .	30.6	29 34 40.0	48.5	+ 33.3	80 41 34.5	+ 2.1
42	78 30	2.0	27.5	5.9	3.7	31	390	380	. .	. .	. .	30.6	78 34 41.2	. .	+ 4 43.2	129 45 45.6	+ 5.2
43	39 34	9 29.8	25.6	6.8	2.6	33	285	310	. .	. .	. .	30.6	39 38 13.4	. .	+ 48.7	90 45 23.3	+ 0.8
44	70 6	10 1.1	25.6	6.0	4.0	38	240	195	. .	. .	. .	30.6	70 8 57.3	. .	+ 2 41.5	121 18 0.0	+ 8.8
45	68 48	9 28.6	24.2	6.0	2.1	35	005	055	. .	. .	. .	30.6	68 51 47.6	. .	+ 2 31.0	120 0 39.8	+10.8
46	69 4	10 1.8	27.0	7.6	4.3	34	090	120	. .	. .	. .	30.6	69 7 59.3	. .	+ 2 33.2	120 16 53.7	+ 2.0
47	155 34	2.3	28.0	8.8	5.3	29	490	535	. .	. .	. .	30.6	155 39 8.9	. .	− 26.6	75 27 38.9	+ 1.3
48	24 18	2.5	29.6	10.8	5.9	38	. .	. .	. .	445	470	30.6	24 20 51.7	. .	+ 26.6	75 27 39.5	+ 1.9
49	48 34	1.7	28.1	8.6	4.0	32	. .	620	. .	650	. .	30.6	48 38 22.0	46.3	+ 1 6.8	99 45 50.0	+17.3
50	32 38	2.6	29.5	9.8	5.0	32	490	500	. .	. .	. .	30.6	32 42 22.8	. .	+ 37.8	83 49 21.8	+ 1.8

No.	Barom.	At. Ther.
	in.	°
7	30.21	29.0
12	30.22	38.3
16	30.24	51.5
20	30.20	56.8
22	30.23	72.0
34	30.12	50.5
39	30.12	50.7
41	30.12	50.3
49	30.10	48.4

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
2	−11 15.2	− 16 10.7	. .	− 27 25.9
15	− 6.7	+ 16 5.8	. .	+ 15 59.1
16	− 6.8	− 16 5.8	. .	− 16 12.6
17	− 4.0	+ 4.6	. .	+ 0.6
18	− 4.0	− 4.5	. .	− 8.5
29	− 8.2	− 5.4	. .	− 13.6
39	− 0.8	+ 8.4	. .	+ 7.6
40	− 0.8	− 8.5	. .	− 9.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Oct. 20	1	Victoria . . .	P.	36.0	39.0	40.4	46.5	48.7	50.8	56.8	58.5	1.2	55 48.66	− 0.69	. .	− 2.50	23 55 45.47	. .
	2	α Andromedæ . .	P.	47.9	50.7	52.5	59.5	1.7	4.0	11.0	12.8	15.7	2 1.76	− 0.33	− 2.47	− 2.55	0 1 58.88	− 0.06
	3	γ Pegasi	P.	41.9	44.4	46.0	52.4	54.5	56.6	2.9	4.5	7.0	6 54.47	− 0.62	− 2.53	− 2.55	0 6 51.30	− 0.02
	4	Polaris	P.	13.0	15.0	9.0	36.0	0.0	27.0	55.0	. .	. .	13 1.85	+41.92	. .	− 2.55	1 13 41.22	− 2.50
	5	ο Piscium . . .	P.	42.1	44.7	46.2	52.3	54.4	56.6	2.8	4.3	6.9	38 54.48	− 0.75	− 2.51	− 2.55	1 38 51.18	− 0.07
	6	β Arietis	P.	37.8	40.5	42.3	48.7	50.9	53.0	59.5	1.3	4.0	47 50.89	− 0.53	− 2.51	− 2.55	1 47 47.81	− 0.02
	7	50 Cassiopeæ . .	P.	15.0	23.4	28.4	47.6	54.4	1.1	20.7	25.4	33.5	52 54.39	+ 2.17	. .	− 2.55	1 52 54.01	+ 0.05
	8	α Arietis . . .	P.	1.0	3.9	5.6	12.0	14.3	16.7	23.3	25.0	27.7	0 14.39	− 0.48	− 2.46	− 2.55	2 0 11.36	− 0.08
	9	Lalande 4528 . .	P.	33.0	35.6	37.2	43.5	45.7	47.8	54.2	55.8	58.4	20 45.69	− 0.61	. .	− 2.52	2 20 42.56	− 3.61
	10	B. A. C. 812 . .	P.	48.8	51.6	53.5	0.6	3.0	5.5	12.5	14.3	17.4	33 3.02	− 1.49	. .	− 2.52	2 32 59.01	− 3.66
	11	γ Ceti.	P.	44.0	46.8	48.3	54.4	56.4	58.4	4.6	6.1	8.6	36 56.40	− 0.85	− 2.53	− 2.55	2 36 53.00	− 0.02
	12	B. A. C. 872 . .	P.	30.7	33.6	35.3	42.2	44.3	46.7	53.5	55.2	57.9	42 44.38	− 0.40	. .	− 2.53	2 42 41.45	− 3.76
	13	ρ³ Arietis	P.	16.9	19.5	21.0	27.6	29.6	31.8	38.3	39.8	42.5	49 29.67	− 0.58	. .	− 2.53	2 49 26.56	− 3.64
	14	B. A. C. 937 . .	P.	23.2	26.4	28.6	. .	. .	. .	50.1	52.2	55.4	53 39.32	− 1.76	. .	− 2.53	2 53 35.03	− 3.71
	15	B. A. C. 938 . .	P.	. .	. .	34.8	37.3	40.2	42.7	45.5	. .	. .	53 40.10	− 1.76	. .	− 2.53	2 53 35.81	− 3.71
	16	48 Cephei	P.	44.7	56.6	3.3	31.0	40.4	49.8	17.0	24.3	35.8	4 40.32	+ 3.55	. .	− 2.55	3 4 41.32	+ 0.29
	17	B. A. C. 1003 . .	P.	0.0	3.3	5.3	12.8	15.4	17.9	25.5	27.4	30.5	8 15.34	− 1.63	. .	− 2.53	3 8 11.18	− 3.56
	18	B. A. C. 1040 . .	P.	34.8	37.7	39.3	46.0	48.5	50.8	57.7	59.4	2.3	14 48.50	− 0.39	. .	− 2.53	3 14 45.58	− 3.79
	19	Ate	P.	. .	. .	. .	52.1	53.9	56.3	. .	. .	. .	17 54.13	− 0.40	. .	− 2.53	3 17 51.20	. .
	20	B. A. C. 1121 . .	P.	56.2	59.0	1.0	8.0	10.3	12.7	19.7	21.5	24.3	32 10.30	− 1.48	. .	− 2.54	3 32 6.28	− 3.38
	21	Clotho	P.	50.7	53.5	55.0	1.0	3.0	5.2	11.3	12.7	15.3	36 3.08	− 0.90	. .	− 2.54	3 35 59.64	. .
	22	B. A. C. 1236 . .	P.	52.7	56.0	57.9	5.7	8.5	11.1	19.0	21.0	24.3	52 8.47	− 1.71	. .	− 2.54	3 52 4.22	− 3.30
	23	B. A. C. 1302 . .	P.	34.7	37.2	38.8	45.2	47.4	49.6	55.9	57.5	0.0	8 47.37	− 0.63	. .	− 2.54	4 8 44.20	− 3.54
	24	B. A. C. 1341 . .	P.	51.8	54.6	56.4	3.0	5.3	7.6	14.4	16.0	18.8	15 5.32	− 0.43	. .	− 2.54	4 15 2.35	− 3.72
	25	62² Tauri	P.	20.8	23.7	25.3	32.2	34.2	36.6	43.2	44.9	47.7	16 34.29	− 0.45	. .	− 2.54	4 16 31.30	− 3.69
	26	B. A. C. 1442 . .	P.	0.2	2.7	4.3	10.5	12.4	14.6	20.9	22.4	25.0	33 12.56	− 0.69	. .	− 2.55	4 33 9.32	− 3.43
	27	B. A. C. 1453 . .	P.	33.0	35.8	37.5	44.1	46.3	48.6	55.3	56.9	59.8	35 46.37	− 0.46	. .	− 2.55	4 35 43.36	− 3.66
	28	B. A. C. 1488 . .	P.	50.0	52.9	54.6	1.6	4.0	6.4	13.4	15.1	18.2	43 4.02	− 1.48	. .	− 2.55	4 42 59.99	− 2.96
	29	B. A. C. 1528 . .	P.	23.6	26.4	28.2	34.8	37.2	39.4	46.0	47.7	50.5	50 37.09	− 0.44	. .	− 2.55	4 50 34.10	− 3.65
	30	Lalande 9484 . .	P.	41.9	44.9	46.5	53.4	55.7	58.0	4.8	6.5	9.6	56 55.70	− 0.38	. .	− 2.55	4 56 52.77	− 3.70
	31	B. A. C. 1570 . .	P.	18.1	20.9	22.5	29.0	31.2	33.3	39.8	41.4	44.2	0 31.16	− 0.53	. .	− 2.55	5 0 28.08	− 3.52
	32	B. A. C. 1599 . .	P.	39.5	42.6	44.4	52.2	54.6	57.1	4.8	6.6	9.6	3 54.60	− 1.62	. .	− 2.55	5 3 50.43	− 2.77
	33	Weisse (2) 245 .	P.	21.5	24.6	26.4	. .	. .	. .	46.0	47.7	50.7	10 36.15	− 0.24	. .	− 2.55	5 10 33.36	− 3.84
	34	Weisse (2) 247 .	P.	. .	. .	31.3	33.8	36.2	38.8	41.2	. .	. .	10 36.26	− 0.24	. .	− 2.55	5 10 33.47	− 3.84
	35	B. A. C. 1694 . .	P.	12.0	15.3	17.2	24.8	27.4	30.0	37.7	39.8	43.0	19 27.37	− 1.66	. .	− 2.56	5 19 23.15	− 2.64
	36	O. Arg. S. 3957 .	P.	56.2	58.9	0.6	7.1	9.3	11.5	18.0	19.6	22.4	21 9.29	− 1.28	. .	− 2.56	5 21 5.45	− 2.80
	37	β Leporis . . .	P.	47.0	49.5	51.3	57.8	0.1	2.3	8.7	10.3	13.0	23 0.00	− 1.28	. .	− 2.56	5 22 56.16	− 2.79
	38	B. A. C. 1762¹. .	P.	13.3	16.0	17.5	23.6	25.5	27.7	33.8	35.3	37.9	29 25.62	− 1.01	. .	− 2.56	5 29 22.05	− 2.95
	39	B. A. C. 1831 . .	P.	2.4	5.0	6.5	12.4	14.5	16.6	22.7	24.3	26.7	40 14.57	− 0.88	. .	− 2.56	5 40 11.13	− 3.01
	40	B. A. C. 1845 . .	P.	40.4	43.7	45.7	53.5	56.3	59.0	6.7	8.7	11.9	42 56.21	− 0.08	. .	− 2.56	5 42 53.57	− 3.95
	41	Weisse 1110 . .	P.	50.5	53.1	54.6	0.9	3.0	5.3	11.5	13.0	15.7	45 3.07	− 0.62	. .	− 2.56	5 44 59.87	− 3.24
	42	B. A. C. 1907 . .	P.	45.0	47.6	49.3	55.5	57.7	59.8	6.0	7.5	10.2	51 57.62	− 0.67	. .	− 2.56	5 51 54.39	− 3.18
	43	B. A. C. 1930 . .	P.	33.6	36.1	37.7	44.2	46.4	48.5	54.8	56.5	59.1	55 46.32	− 0.58	. .	− 2.56	5 55 43.18	− 3.26
	44	B. A. C. 1989 . .	P.	44.6	47.1	48.7	55.0	57.1	59.3	5.7	7.3	10.0	4 57.20	− 0.61	. .	− 2.56	6 4 54.03	− 3.19
	45	B. A. C. 2016 . .	P.	14.2	17.0	18.6	25.3	27.5	29.7	36.5	38.2	40.9	9 27.54	− 0.46	. .	− 2.56	6 9 24.52	− 3.36
	46	B. A. C. 2035 . .	P.	18.5	21.7	23.7	31.5	34.3	36.8	44.7	46.7	50.1	12 34.22	− 1.71	. .	− 2.57	6 12 29.94	− 2.17
	47	B. A. C. 2051 . .	P.	23.2	26.2	27.9	35.0	37.3	39.5	46.7	48.4	51.4	15 37.29	− 1.48	. .	− 2.57	6 15 33.24	− 2.32
	48	B. A. C. 2089 . .	P.	31.6	34.7	36.8	44.7	47.4	50.0	58.2	0.2	3.5	20 47.46	− 1.74	. .	− 2.57	6 20 43.15	− 2.08
	49	Lalande 12661 .	P.	19.8	22.6	24.4	31.3	33.6	35.9	43.0	44.8	47.7	30 33.68	− 0.33	. .	− 2.57	6 30 30.77	− 3.41

1, 19, 21. Wire A used.
28. Telescope micrometer reading decreased one revolution in reduction.
41. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	28 10	10 1.5	27.5	8.2	3.9	28	. .	. .	. .	. .	365	30.6	28 18 1.1	. .	+ 31.7	79 24 54.0	− 3.6
2	10 26	0.6	29.0	10.0	4.1	37	800	765	. .	. .	. .	30.6	10 29 2.9	. .	+ 10.9	61 35 35.0	+ 2.2
3	24 20	0.1	26.7	8.0	2.3	36	095	085	. .	. .	. .	30.6	24 23 30.3	. .	+ 26.7	75 30 18.2	+ 2.1
4	310 12	1.0	28.2	8.5	5.6	34	480	500	445	470	480	30.6	310 15 53.8	. .	− 1 9.4	1 21 5.6	+ 0.4
5	30 18	9 29.6	27.2	8.4	3.5	37	995	025	. .	060	100	30.6	30 21 0.2	. .	+ 34.4	81 27 55.8	+ 1.0
6	18 38	10 1.0	29.5	10.8	4.9	37	245	260	. .	310	340	30.6	18 41 10.0	46.7	+ 19.9	69 47 51.1	+ 2.7
7	327 2	9 29.0	27.1	6.9	3.7	37	. .	885	. .	875	. .	30.6	327 5 4.1	. .	− 38.1	18 10 47.2	+ 0.2
8	15 58	10 0.3	28.4	10.0	4.0	38	945	920	. .	950	970	30.6	16 0 45.5	46.4	+ 16.9	67 7 23.6	+ 1.6
9	22 44	9 29.3	27.0	8.4	2.4	34	450	480	. .	. .	. .	30.6	22 47 55.2	45.8	+ 24.8	73 54 41.2	+23.9
10	69 30	29.7	25.2	5.2	1.8	31	880	850	. .	. .	. .	30.6	69 34 35.8	. .	+ 2 37.0	120 43 34.0	+25.1
11	36 6	10 1.2	27.9	8.1	4.0	33	830	860	. .	840	880	30.6	36 10 3.7	. .	+ 43.1	87 17 8.0	+ 1.2
12	12 4	1.5	29.9	10.9	5.5	32	225	220	. .	. .	. .	50.6	12 8 26.9	. .	+ 12.7	63 15 0.8	+22.1
13	21 16	9 29.5	27.5	9.4	3.2	28	260	240	. .	. .	. .	30.6	21 21 29.7	. .	+ 23.1	72 28 14.0	+22.9
14	79 32	10 2.2	26.4	6.9	3.1	32	430	. .	. .	. .	455	30.6	79 36 25.3	. .	+ 5 11.6	130 47 58.1	+25.7
15	79 32	2.2	26.4	6.9	3.1	32	. .	500	. .	510	. .	30.6	79 36 24.7	. .	+ 5 11.6	130 47 57.5	+25.7
16	321 34	9 29.5	26.0	6.2	4.8	34	. .	660	. .	625	. .	30.6	321 37 54.2	. .	− 46.7	12 43 28.7	+ 0.1
17	75 10	10 1.0	26.1	6.2	3.3	33	000	025	. .	. .	. .	30.6	75 14 17.0	. .	+ 3 40.9	126 24 19.1	+26.2
18	11 40	9 28.3	25.5	7.2	2.2	35	470	465	. .	. .	. .	30.6	11 43 40.9	. .	+ 12.3	62 50 14.4	+20.4
19	12 20	29.2	26.5	7.7	2.7	25	. .	. .	. .	. .	475	30.6	12 28 46.8	. .	+ 13.1	63 35 21.1	− 1.2
20	69 2	10 3.1	28.7	8.8	4.8	37	. .	305	. .	350	. .	30.6	69 5 9.2	. .	+ 2 33.7	120 14 4.1	+26.5
21	38 54	9 29.0	24.8	6.0	1.6	38	. .	540	. .	565	. .	30.6	38 59 27.1	. .	+ 47.9	90 6 36.2	− 5.0
22	78 4	10 2.6	28.5	8.0	5.2	33	625	580	. .	. .	. .	30.6	78 8 6.0	. .	+ 4 35.0	129 19 2.2	+27.2
23	23 44	9 29.7	27.5	7.5	3.6	35	235	255	. .	. .	. .	30.6	23 47 42.9	42.2	+ 26.1	74 54 30.2	+19.5
24	13 30	29.3	27.0	8.0	2.5	37	400	325	. .	. .	. .	30.6	13 33 11.0	. .	+ 14.2	64 39 46.4	+16.9
25	14 48	10 1.1	28.9	9.2	5.0	31	. .	. .	. .	660	665	30.6	14 52 37.1	. .	+ 15.8	65 59 14.3	+17.1
26	26 52	0.4	28.0	8.5	3.7	34	825	810	. .	. .	. .	30.6	26 55 48.8	. .	+ 30.1	78 2 40.1	+18.8
27	14 58	0.8	29.1	9.4	4.4	33	580	550	. .	. .	. .	30.6	15 2 7.4	. .	+ 15.9	66 8 44.5	+15.8
28	69 2	9 29.5	26.5	6.9	2.6	36	500	515	. .	. .	. .	30.6	69 5 39.1	. .	+ 2 34.2	120 14 34.5	+26.3
29	13 58	10 2.5	0.0	10.0	5.6	34	620	625	. .	. .	. .	30.6	14 1 50.1	. .	+ 14.8	65 8 26.1	+14.4
30	11 18	3.2	29.8	10.2	6.1	33	755	760	. .	. .	. .	30.6	11 22 3.1	. .	+ 11.9	62 28 36.2	+13.3
31	18 34	1.0	29.8	10.2	5.0	34	050	070	. .	. .	. .	30.6	18 37 59.2	. .	+ 20.0	69 44 40.4	+14.9
32	74 38	1.0	26.5	7.1	2.9	32	085	115	. .	. .	. .	30.6	74 42 30.7	. .	+ 3 33.9	125 52 25.8	+26.7
33	5 26	9 29.2	27.6	8.0	4.2	33	630	. .	. .	. .	715	30.6	5 30 7.5	. .	+ 5.7	56 36 34.4	+10.5
34	5 26	29.2	27.6	8.0	4.2	34	. .	560	. .	650	. .	30.6	5 29 52.9	. .	+ 5.7	56 36 19.8	+10.5
35	76 14	10 2.0	27.8	7.5	4.5	40	105	120	. .	. .	. .	30.6	76 16 27.0	41.7	+ 3 58.6	127 26 46.8	+26.5
36	59 38	9 28.5	25.5	7.5	3.9	37	800	815	. .	. .	. .	30.6	59 41 3.6	. .	+ 1 41.3	110 49 6.1	+23.8
37	59 38	28.5	25.5	7.5	3.9	29	460	480	. .	. .	. .	30.6	59 43 11.2	. .	+ 1 41.3	110 51 13.7	+23.7
38	44 48	10 4.5	0.0	9.9	5.7	34	050	085	. .	. .	. .	30.6	44 51 57.8	. .	+ 59.1	95 59 18.1	+20.0
39	37 42	0.0	24.8	7.1	2.6	37	250	230	. .	. .	. .	30.6	37 45 13.2	. .	+ 46.0	88 52 20.4	+17.5
40	359 44	9 28.0	26.0	7.9	2.0	38	275	210	. .	. .	. .	30.6	359 46 58.4	. .	− 0.2	50 53 19.4	+ 6.0
41	24 30	10 1.0	27.9	8.8	4.6	36	. .	. .	. .	725	740	30.6	24 30 47.1	. .	+ 27.1	75 37 35.4	+13.4
42	26 2	3.1	0.0	10.5	6.2	36	610	650	. .	. .	. .	30.6	26 5 18.8	. .	+ 29.1	77 12 9.1	+13.3
43	21 10	0.9	28.1	8.8	4.0	37	115	090	. .	. .	. .	30.6	21 13 13.6	. .	+ 23.1	72 19 57.9	+11.5
44	22 40	9 27.9	24.1	5.9	1.3	35	655	670	. .	. .	. .	30.6	22 43 38.8	. .	+ 24.9	73 50 24.9	+11.3
45	15 2	10 1.0	27.4	8.9	3.8	32	635	620	. .	. .	. .	30.6	15 6 22.4	. .	+ 16.1	66 12 59.7	+ 8.5
46	77 58	2.0	26.3	6.2	4.4	34	825	780	. .	. .	. .	30.6	78 1 49.0	. .	+ 4 33.9	129 12 44.1	+25.0
47	68 48	0.5	24.8	6.6	3.5	37	100	110	. .	. .	. .	30.6	68 51 14.2	. .	+ 2 32.7	120 0 8.1	+23.2
48	78 58	6.3	0.0	10.0	7.8	37	. .	240	. .	215	. .	30.6	79 1 8.5	. .	+ 4 58.1	130 12 27.8	+24.8
49	9 44	9 29.4	26.0	7.7	2.1	34	015	035	. .	. .	. .	30.6	9 48 2.5	. .	+ 10.3	60 54 34.0	+ 5.0

No.	Barom.	At. Ther.
	in.	°
6	30.09	48.4
8	30.08	48.1
9	30.07	47.9
23	30.05	44.6
35	30.05	43.8

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	″

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Oct. 20	1	B. A. C. 2194	P.	7.2	10.0	11.7	18.4	20.6	23.0	29.6	31.3	34.2	36 20.67	− 0.43	. .	− 2.57	6 36 17.67	− 3.27
	2	B. A. C. 2214	P.	35.0	38.2	39.8	47.0	49.4	51.7	58.9	0.5	3.5	39 49.33	− 1.50	. .	− 2.57	6 39 45.26	− 2.12
	3	B. A. C. 2238	P.	17.5	20.3	22.0	28.7	31.0	33.1	39.7	41.4	44.2	44 30.88	− 0.46	. .	− 2.57	6 44 27.85	− 3.20
	4	B. A. C. 2444	P.	55.0	57.6	59.2	5.5	7.5	9.6	15.7	17.4	20.0	18 7.50	− 0.69	. .	− 2.58	7 18 4.23	− 2.74
	5	B. A. C. 2462	P.	15.8	18.4	20.0	26.0	28.2	30.3	36.4	38.0	40.5	20 28.18	− 0.75	. .	− 2.58	7 20 24.85	− 2.66
	6	α² Geminorum	P.	29.0	31.8	33.9	41.0	43.4	45.8	53.0	54.7	57.7	26 43.37	− 0.27	− 2.64	− 2.55	7 26 40.55	+ 0.33
	7	α Canis Minoris.	P.	39.0	41.6	43.2	49.2	51.3	53.3	59.4	1.0	3.4	32 51.27	− 0.80	− 2.57	− 2.55	7 32 47.92	− 0.14
	8	β Geminorum	P.	31.9	34.7	36.5	43.5	45.7	48.0	55.0	56.8	59.6	37 45.74	− 0.36	− 2.52	− 2.55	7 37 42.83	− 0.06
	9	B. A. C. 2592	P.	51.4	54.3	56.0	3.3	5.9	8.4	15.8	17.6	20.7	43 5.93	− 0.24	. .	− 2.58	7 43 3.11	− 3.15
	10	B. A. C. 2632	P.	14.9	17.7	19.2	25.8	28.0	30.2	36.6	38.3	41.0	48 27.97	− 0.53	. .	− 2.58	7 48 24.86	− 2.76
	11	Moon II, S.	P.	. .	. .	16.1	18.5	21.0	23.4	25.6	. .	. .	57 20.94	− 0.42	. .	− 2.59	7 57 17.93	−74.18
	12	β Leonis	Sk.	32.7	35.5	37.0	43.3	45.4	47.5	54.0	55.6	58.3	42 45.48	− 0.47	− 2.71	− 2.58	11 42 42.43	+ 0.11
	13	12 Canum Venat.	Sk.	. .	. .	9.0	11.5	14.3	16.8	19.3	. .	. .	50 14.18	+ 0.03	− 2.51	− 2.58	12 50 11.63	− 0.07
	14	Polaris, S. P.	Sk.	. .	. .	23.5	. .	28.0	32.0	35.0	36.0	47.0	14 26.58	−42.50	. .	− 2.58	1 13 41.50	− 2.18
21	15	Sun I, N.	Sk.	21.2	23.7	25.3	31.3	33.4	35.6	41.8	43.4	46.0	42 33.52	− 0.88	. .	− 2.62	13 42 30.02	. .
	16	Sun II, S.	Sk.	32.5	35.2	36.7	43.2	45.1	47.1	53.3	54.9	57.5	44 45.06	− 0.88	. .	− 2.62	13 44 41.56	. .
	17	Venus I, N.	Sk.	58.5	1.2	2.8	. .	. .	. .	19.4	21.1	23.7	13 11.12	− 0.91	. .	− 2.63	14 13 7.58	+ 0.35
	18	Venus II, S.	Sk.	. .	. .	7.7	9.8	11.8	13.8	16.0	. .	. .	13 11.82	− 0.91	. .	− 2.63	14 13 8.28	− 0.35
	19	γ² Ursæ Minoris	Sk.	14.0	22.4	27.4	47.4	54.3	0.8	21.3	26.0	34.5	20 54.23	+ 2.28	. .	− 2.58	15 20 53.93	+ 0.23
	20	α Coronæ Borealis	Sk.	13.6	16.6	18.2	25.0	27.4	29.7	36.5	38.2	41.1	29 27.37	− 0.25	− 2.62	− 2.58	15 29 24.54	+ 0.04
	21	α Serpentis	Sk.	58.6	1.2	2.9	9.0	11.1	13.1	19.3	20.8	23.4	38 11.04	− 0.61	− 2.66	− 2.58	15 38 7.85	+ 0.10
	22	κ Aquilæ	F.	. .	. .	14.0	16.0	18.0	20.0	24.1	25.7	28.3	30 15.94	− 0.99	− 2.74	− 2.70	19 30 12.25	+ 0.08
	23	γ Aquilæ	F.	. .	20.2	22.2	24.4	26.4	28.5	32.6	34.1	37.0	40 24.34	− 0.70	− 2.66	− 2.70	19 40 20.94	− 0.01
	24	α Aquilæ	F.	34.2	36.8	38.2	44.4	46.6	48.6	54.7	56.3	59.0	44 46.53	− 0.73	− 2.69	− 2.70	19 44 43.10	+ 0.03
	25	λ Ursæ Minoris.	F.	23.0	38.0	0.0	34.0	22.0	11.0	. .	3.0	20.0	47 21.40	+54.19	. .	− 2.70	19 48 12.89	− 0.59
	26	B. A. C. 6851	F.	26.4	29.5	31.4	36.3	38.7	41.2	43.9	46.2	. .	51 41.27	− 0.20	. .	− 2.70	19 51 38.37	− 1.40
	27	XIX, 17	F.	. .	. .	. .	. .	. .	. .	. .	3.3	6.5	51 51.51	− 1.50	. .	− 2.70	19 51 47.31	− 3.03
	28	B. A. C. 6863	F.	. .	. .	. .	. .	. .	. .	11.0	14.0	18.8	52 55.61	+ 0.70	. .	− 2.70	19 52 53.61	− 0.33
	29	Mars I, S.	F.	11.0	13.9	16.0	22.5	24.7	27.0	33.6	35.2	38.1	5 24.67	− 1.25	. .	− 2.70	20 5 20.72	+ 0.38
	30	Mars, N.	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	31	α Andromedæ	F.	48.1	51.0	52.8	59.7	2.1	4.4	11.3	13.0	15.9	2 2.03	− 0.37	− 2.70	− 2.70	0 1 58.96	+ 0.02
	32	γ Pegasi	F.	42.0	44.7	46.2	52.5	54.6	56.7	3.0	4.5	7.2	6 54.60	− 0.65	− 2.64	− 2.70	0 6 51.25	− 0.06
	33	β Ceti	F.	13.6	16.2	. .	. .	. .	. .	35.2	36.8	39.4	37 26.52	− 1.20	− 2.77	− 2.70	0 37 22.62	+ 0.12
	34	Polaris	F.	. .	. .	13.0	37.0	4.0	30.0	56.0	. .	. .	13 4.00	+41.64	. .	− 2.70	1 13 42.94	− 0.69
	35	ε Tauri	Sk.	12.7	15.5	17.0	23.6	25.7	27.8	34.4	35.9	38.6	21 25.69	− 0.52	− 2.44	− 2.58	4 21 22.59	− 0.15
	36	α Tauri	Sk.	38.9	41.6	43.3	49.5	51.6	53.8	0.2	1.7	4.3	28 51.66	− 0.56	− 2.60	− 2.58	4 28 48.52	0.00
	37	B. A. C. 1453	Sk.	33.0	35.8	37.6	44.3	46.4	48.6	55.2	57.0	59.6	35 46.39	− 0.44	. .	− 2.51	4 35 43.44	− 3.68
	38	B. A. C. 1483	Sk.	36.5	38.6	44.0	46.6	49.0	52.1	54.8	59.9	1.9	41 49.27	− 1.46	. .	− 2.51	4 41 45.30	− 2.95
	39	B. A. C. 1488	Sk.	. .	59.4	1.8	4.2	6.6	9.0	13.7	15.6	18.5	43 4.24	− 1.27	. .	− 2.51	4 43 0.46	− 2.98
	40	B. A. C. 1533	Sk.	. .	. .	45.4	48.3	50.9	53.5	56.2	. .	. .	50 50.86	− 1.47	. .	− 2.51	4 50 46.88	− 2.88
	41	Lalande 9484	Sk.	42.0	44.8	46.6	53.5	55.7	58.1	5.0	6.7	9.7	56 55.79	− 0.37	. .	− 2.52	4 56 52.90	− 3.73
	42	B. A. C. 1570	Sk.	18.3	21.0	22.6	29.2	31.3	33.4	40.0	41.6	44.2	0 31.29	− 0.50	. .	− 2.52	5 0 28.27	− 3.54
	43	B. A. C. 1627	Sk.	50.6	53.6	55.6	2.7	5.3	7.7	15.0	16.7	19.7	10 5.21	− 0.26	. .	− 2.52	5 10 2.43	− 3.87
	44	B. A. C. 1650	Sk.	50.5	53.6	55.4	3.1	5.7	8.3	15.5	17.7	20.4	13 5.58	− 1.36	. .	− 2.52	5 13 1.70	− 2.74
	45	B. A. C. 1693	Sk.	. .	. .	. .	. .	. .	. .	34.2	36.0	39.5	19 23.47	− 1.46	. .	− 2.52	5 19 19.49	− 2.64
	46	B. A. C. 1718	Sk.	. .	. .	. .	18.5	20.8	23.3	28.1	29.9	32.8	23 18.41	− 1.31	. .	− 2.52	5 23 14.58	− 2.69
	47	B. A. C. 1771	Sk.	31.2	34.7	36.2	41.2	43.4	46.1	48.5	51.2	. .	30 46.07	− 1.32	. .	− 2.53	5 30 42.22	− 2.63
	48	B. A. C. 1831	Sk.	2.5	5.0	6.4	12.5	14.5	16.6	22.7	24.2	26.7	40 14.57	− 0.78	. .	− 2.53	5 40 11.26	− 3.04
	49	B. A. C. 1845	Sk.	40.5	43.6	45.8	53.6	56.4	58.9	6.7	8.6	12.0	42 56.23	− 0.12	. .	− 2.53	5 42 53.58	− 3.99
	50	B. A. C. 1882	Sk.	30.0	32.9	34.7	41.5	43.9	46.2	53.2	55.0	57.9	48 43.92	− 0.34	. .	− 2.53	5 48 41.05	− 3.62

19. Bisections reduced for wires III and V.
38. Bisections at wires II and V.
47. Bisections at wires V and VI.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	13 34	9 29.0	27.2	8.0	3.5	33	570	565	. .	. .	. .	30.6	13 38 8.8	. .	+ 14.4	64 44 44.4	+ 5.8
2	69 44	28.5	23.6	5.5	1.0	37	. .	320	. .	380	. .	30.6	69 47 13.1	. .	+ 2 40.5	120 56 14.8	+22.1
3	15 4	10 0.2	26.7	7.6	3.3	32	. .	350	. .	360	. .	30.6	15 8 27.6	. .	+ 16.1	66 15 4.9	+ 5.6
4	26 54	9 29.9	26.0	7.9	2.9	33	. .	. .	. .	110	050	30.6	26 58 17.1	. .	+ 30.4	78 5 8.7	+ 7.0
5	30 16	10 2.3	28.2	8.1	4.3	31	765	760	. .	. .	. .	30.6	30 20 35.0	. .	+ 34.9	81 27 31.1	+ 8.0
6	6 40	9 28.9	26.3	8.0	2.9	34	510	520	. .	575	590	30.6	6 43 54.6	. .	+ 7.0	57 50 22.8	− 0.2
7	33 16	10 3.0	28.5	10.2	6.4	32	945	965	. .	010	030	30.6	33 20 15.3	. .	+ 39.2	84 27 15.7	0.0
8	10 30	0.2	28.3	8.8	4.5	34	510	515	. .	520	535	30.6	10 33 53.6	38.9	+ 11.1	61 40 25.9	+ 0.6
9	5 16	0.2	28.9	9.3	5.1	30	970	985	. .	. .	. .	30.6	5 20 47.2	. .	+ 5.6	56 27 14.0	− 2.5
10	18 36	2.0	29.5	11.0	5.8	31	800	815	. .	. .	. .	30.6	18 40 33.1	. .	+ 20.2	69 47 14.5	+ 1.8
11	13 26	5.3	0.5	13.1	10.1	27	460	365	245	115	030	30.6	13 31 40.5	39.0	+ 14.4	64 38 16.1	. .
12	23 32	3.3	1.0	15.0	8.2	29	. .	370	. .	370	. .	30.3	23 37 8.1	. .	+ 25.4	74 43 54.7	+ 0.5
13	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	.	. . . .	. .	. .	. . . .	. .
14	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	.	. . . .	. .	. .	. . . .	. .
15	49 16	9 25.0	20.0	4.9	29.3	32	502	380	. .	. .	. .	30.3	49 20 30.6	. .	+ 1 5.4	100 27 57.2	. .
16	49 48	26.0	21.7	6.3	1.8	31	. .	. .	. .	548	596	30.3	49 52 42.0	68.2	+ 1 6.7	101 0 9.9	. .
17	51 26	10 4.5	2.3	15.0	7.7	33	350	. .	. .	. .	240	30.3	51 30 7.2	. .	+ 1 10.4	102 37 38.8	. .
18	51 26	4.5	2.3	15.0	7.7	32	. .	580	. .	660	. .	30.3	51 30 17.6	. .	+ 1 10.4	102 37 49.2	. .
19	326 34	9 29.5	0.2	11.7	7.3	35	029	. .	. .	. .	989	30.3	326 37 44.1	. .	− 36.7	17 43 28.6	+ 4.5
20	11 42	10 1.5	0.6	12.4	4.7	36	. .	220	. .	270	. .	30.3	11 45 25.0	. .	+ 11.6	62 51 57.8	+ 3.6
21	32 0	1.5	29.0	10.3	4.2	33	. .	810	. .	890	. .	30.3	32 4 2.6	73.6	+ 34.8	83 10 58.6	+ 4.6
22	46 8	2.6	27.5	7.8	3.1	38	. .	. .	. .	. .	512	29.9	46 10 52.0	. .	+ 58.6	97 18 11.8	+ 2.3
23	28 30	9 28.2	25.7	6.2	0.8	32	. .	. .	. .	764	772	29.9	28 34 22.6	. .	+ 30.7	79 41 14.5	− 0.1
24	30 16	29.2	27.0	5.2	0.7	31	836	848	. .	. .	. .	29.9	30 20 35.8	. .	+ 33.0	81 27 30.0	+ 1.9
25	309 54	26.9	24.2	4.4	2.0	31	. .	818	804	820	. .	29.9	309 58 37.7	. .	− 1 7.2	1 3 51.7	+ 0.4
26	4 4	28.9	27.0	6.0	1.0	33	550	550	. .	. .	. .	29.9	4 8 9.7	. .	+ 4.1	55 14 35.0	+15.5
27	73 48	10 5.5	1.5	9.8	6.9	31	. .	. .	. .	940	960	29.9	73 52 29.0	. .	+ 3 12.6	125 2 2.8	− 6.4
28	340 54	9 27.3	25.3	4.2	1.9	32	. .	. .	. .	564	536	29.9	340 58 27.3	65.5	− 19.5	32 4 29.0	+18.8
29	61 36	10 0.6	28.0	7.2	2.7	32	. .	. .	. .	. .	342	29.9	61 40 27.2	. .	+ 1 44.6	112 48 33.0	. .
30	61 36	0.6	28.0	7.2	2.7	33	. .	. .	. .	260	. .	29.9	61 40 13.0	. .	+ 1 44.6	112 48 18.8	. .
31	10 26	9 27.0	25.8	6.7	0.9	38	. .	. .	. .	110	116	29.9	10 29 1.1	. .	+ 10.6	61 35 32.9	+ 0.3
32	24 20	29.7	26.9	6.5	1.5	36	. .	108	. .	116	. .	29.9	24 23 30.2	56.2	+ 26.1	75 30 17.5	+ 1.5
33	57 28	28.6	26.0	6.2	2.3	33	. .	. .	. .	432	. .	29.9	57 32 11.6	57.0	+ 1 30.1	108 40 2.9	+ 1.1
34	310 12	29.8	27.6	6.2	4.1	34	725	700	580	590	580	29.9	310 15 52.1	56.6	− 1 7.8	1 21 5.5	+ 0.7
35	19 56	10 3.6	1.9	12.0	5.3	38	. .	000	. .	086	. .	30.3	19 58 56.5	52.2	+ 21.1	71 5 38.8	+ 2.5
36	22 34	3.2	1.2	10.8	4.1	35	. .	523	. .	564	. .	30.3	22 37 35.6	. .	+ 24.2	73 44 21.0	+ 2.0
37	14 58	5.0	4.2	12.9	7.5	33	256	170	. .	. .	. .	30.3	15 2 8.6	. .	+ 15.6	66 8 45.4	+15.8
38	78 20	7.6	4.0	11.4	8.4	35	. .	484	. .	. .	495	30.3	78 23 33.1	. .	+ 4 35.4	129 34 29.7	+27.1
39	69 2	3.5	29.5	8.9	4.4	35	. .	. .	. .	. .	070	30.3	69 5 43.6	. .	+ 2 31.0	120 14 35.8	+26.1
40	78 34	4.0	0.6	7.9	5.0	32	. .	. .	. .	. .	360	30.3	78 38 24.7	. .	+ 4 41.3	129 49 27.2	+27.1
41	11 18	4.6	2.0	10.5	5.8	33	. .	. .	. .	622	620	30.3	11 22 4.7	. .	+ 11.7	62 28 37.6	+13.3
42	18 34	4.2	2.0	10.0	5.4	33	. .	860	. .	994	. .	30.3	18 37 59.8	. .	+ 19.6	69 44 40.6	+14.9
43	5 36	6.8	2.0	14.3	7.8	37	560	540	. .	. .	. .	30.3	5 39 1.9	. .	+ 5.8	56 45 28.9	+10.7
44	73 48	2.7	29.9	8.5	4.7	37	. .	810	. .	790	. .	30.3	73 51 1.6	. .	+ 3 18.1	125 0 40.9	+26.2
45	78 32	5.9	2.5	8.5	5.3	32	796	950	. .	. .	. .	30.3	78 36 14.9	. .	+ 4 40.6	129 47 16.7	+26.6
46	71 18	5.0	2.2	10.6	6.5	35	. .	. .	. .	270	264	30.3	71 21 38.5	. .	+ 2 50.8	122 30 50.5	+25.5
47	71 56	4.6	0.8	10.5	4.6	33	. .	. .	. .	120	190	30.3	72 0 11.9	. .	+ 2 57.2	123 9 30.3	+25.4
48	37 42	6.0	1.1	11.0	4.7	36	840	850	. .	. .	. .	30.3	37 45 14.4	. .	+ 45.1	88 52 20.7	+17.4
49	359 44	4.0	2.4	11.5	5.0	37	. .	. .	. .	820	854	30.3	359 47 0.3	. .	− 0.2	50 53 21.3	+ 6.1
50	9 54	3.3	1.7	9.5	5.1	33	. .	274	. .	376	. .	30.3	9 58 9.6	. .	+ 10.2	61 4 41.0	+ 8.6

No.	Barom.	At. Ther.
	in.	°
8	30.04	41.7
11	30.04	41.4
16	30.03	61.8
21	30.05	83.0
28	30.01	66.2
32	30.01	59.0
33	30.01	58.8
34	30.02	58.5
35	30.01	54.8

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
11	−13 30.2	− 15 59.6	. .	− 29 29.8
15	− 6.7	+ 16 6.3	. .	+ 15 59.6
16	− 6.8	− 16 6.3	. .	− 16 13.1
17	− 4.1	+ 5.2	. .	+ 1.1
18	− 4.1	− 5.2	. .	− 9.3
29	− 8.1	− 7.1	. .	− 15.2
30	− 8.1	+ 7.1	. .	− 1.0

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Oct. 21	1	B. A. C. 1989	Sk.	44.5	47.1	48.8	55.0	57.1	59.3	5.6	7.1	9.7	4 57.13	− 0.56	. .	− 2.54	6 4 54.03	− 3.22
	2	B. A. C. 2016	Sk.	. .	22.9	25.2	27.5	29.7	31.9	36.6	38.2	40.9	9 27.50	− 0.44	. .	− 2.54	6 9 24.52	− 3.39
	3	δ Ursæ Minoris, S. P.	Sk.	. .	. .	42.0	6.5	33.5	58.5	. .	. .	. .	12 32.78	−15.48	. .	− 2.58	18 12 14.72	+ 0.48
	4	μ Geminorum	Sk.	. .	25.8	28.0	30.3	32.4	34.6	39.0	40.6	43.5	15 30.19	− 0.46	− 2.51	− 2.58	6 15 27.15	− 0.11
	5	Lalande 12661	Sk.	19.7	22.6	24.3	31.3	33.6	36.0	42.9	44.6	47.7	30 33.63	− 0.34	. .	− 2.55	6 30 30.74	− 3.45
	6	51 Cephei	Sk.	19.5	13.5	45.0	. .	. .	. .	. .	. .	. .	41 33.97	+17.07	. .	− 2.58	6 41 48.46	− 0.06
	7	B. A. C. 2238	Sk.	17.4	20.3	21.9	28.5	30.7	33.0	39.8	41.6	44.4	44 30.84	− 0.44	. .	− 2.55	6 44 27.85	− 3.23
	8	B. A. C. 2285	Sk.	58.3	1.0	2.6	8.9	11.0	13.2	19.5	20.9	23.7	53 11.01	− 0.56	. .	− 2.56	6 53 7.89	− 3.00
	9	B. A. C. 2313	Sk.	39.7	42.4	44.2	50.8	53.0	55.2	1.8	3.4	6.1	57 52.96	− 0.46	. .	− 2.56	6 57 49.94	− 3.14
	10	47 Geminorum	Sk.	30.3	33.1	34.8	41.8	44.0	46.3	53.3	54.7	57.6	3 43.99	− 0.38	. .	− 2.56	7 3 41.05	− 3.22
	11	B. A. C. 2364	Sk.	58.6	0.3	4.9	7.0	9.3	11.5	13.7	18.3	20.1	7 9.30	− 0.42	. .	− 2.56	7 7 6.32	− 3.15
	12	B. A. C. 2398	Sk.	47.9	50.3	51.9	58.4	0.5	2.7	9.1	10.6	13.4	11 0.53	− 0.55	. .	− 2.56	7 10 57.42	− 2.92
	13	B. A. C. 2434	Sk.	50.2	53.0	54.7	1.2	3.4	5.6	12.3	14.0	16.8	16 3.47	− 0.45	. .	− 2.57	7 16 0.45	− 3.05
	14	B. A. C. 2462	Sk.	15.8	18.5	19.9	26.2	28.3	30.3	36.3	37.8	40.4	20 28.17	− 0.68	. .	− 2.57	7 20 24.92	− 2.69
	15	α² Geminorum	Sk.	28.9	31.9	33.8	41.0	43.5	45.8	53.1	54.8	57.8	26 43.40	− 0.28	− 2.62	− 2.58	7 26 40.54	+ 0.28
	16	α Canis Minoris	Sk.	39.0	41.5	43.1	49.2	51.3	53.3	59.3	1.0	3.7	32 51.27	− 0.72	− 2.63	− 2.58	7 32 47.97	− 0.11
	17	β Geminorum	Sk.	31.8	34.7	36.2	43.4	45.7	48.0	55.0	56.8	59.9	37 45.72	− 0.35	− 2.46	− 2.58	7 37 42.79	− 0.15
	18	B. A. C. 2564	Sk.	16.7	19.3	20.8	27.1	29.2	31.3	37.6	39.0	41.6	39 29.18	− 0.64	. .	− 2.57	7 39 25.97	− 2.64
	19	λ Ursæ Minoris, S. P.	Sk.	. .	. .	. .	52.0	0.0	11.0	20.0	. .	. .	49 0.74	−47.48	. .	− 2.58	19 48 10.68	− 1.55
	20	ω¹ Cancri	Sk.	. .	23.3	25.5	27.6	30.0	32.3	36.7	38.5	41.3	53 27.72	− 0.40	. .	− 2.58	7 53 24.74	− 2.90
	21	B. A. C. 2720	Sk.	36.5	39.0	40.6	46.8	48.9	51.1	57.3	58.9	1.5	1 48.96	− 0.60	. .	− 2.58	8 1 45.78	− 2.58
	22	B. A. C. 2730	Sk.	. .	. .	58.6	1.0	3.3	5.5	10.1	11.8	14.7	3 0.99	− 0.40	. .	− 2.58	8 2 58.01	− 2.85
	23	B. A. C. 2788	Sk.	56.0	58.7	0.3	6.8	9.1	11.4	18.0	19.7	22.2	13 9.13	− 0.48	. .	− 2.58	8 13 6.07	− 2.67
	24	B. A. C. 2799	Sk.	5.0	7.7	9.4	15.9	17.9	20.2	26.6	28.2	30.9	16 17.98	− 0.52	. .	− 2.59	8 16 14.87	− 2.60
	25	ε Hydræ	Sk.	2.6	5.1	6.6	12.7	14.8	16.9	23.0	24.5	27.2	40 14.82	− 0.70	− 2.58	− 2.58	8 40 11.54	− 0.04
	26	Moon II	Sk.	50.2	52.9	54.7	1.5	3.7	5.9	12.7	14.4	17.2	57 3.69	− 0.46	. .	− 2.60	8 57 0.63	−70.88
22	27	α Cassiopeæ	P.	9.5	14.0	16.8	27.8	31.3	34.9	45.9	48.4	53.0	33 31.29	+ 0.50	. .	− 2.54	0 33 29.25	+ 0.06
	28	β Ceti	P.	13.4	16.2	17.8	24.2	26.3	28.5	34.9	36.5	39.2	37 26.33	− 1.15	− 2.62	− 2.54	0 37 22.64	+ 0.13
	29	ε Piscium	P.	21.8	24.4	25.9	32.1	34.2	36.3	42.4	43.9	40.5	56 34.17	− 0.74	− 2.52	− 2.54	0 56 30.89	0.00
	30	Polaris	P.	14.0	24.5	13.0	. .	8.0	28.0	58.0	. .	. .	13 6.09	+39.70	. .	− 2.54	1 13 43.25	− 0.25
	31	θ¹ Ceti	P.	41.5	44.0	45.7	51.8	53.8	55.9	2.0	3.5	6.2	17 53.82	− 0.99	− 2.69	− 2.54	1 17 50.29	+ 0.17
	32	β Arietis	P.	37.9	40.5	42.2	48.7	50.9	53.1	59.5	1.0	3.7	47 50.83	− 0.52	− 2.44	− 2.54	1 47 47.77	− 0.08
	33	50 Cassiopeæ	P.	15.3	23.4	28.3	48.0	54.2	0.9	20.8	25.7	33.8	52 54.49	+ 2.00	. .	− 2.54	1 52 53.95	− 0.04
	34	α Arietis	P.	1.0	3.9	5.5	12.2	14.4	16.6	23.2	24.9	27.6	0 14.37	− 0.47	− 2.43	− 2.54	2 0 11.46	0.00
24	35	Moon II	Sk.	17.7	20.1	21.9	27.9	29.9	32.2	38.5	40.1	42.5	29 30.09	− 0.69	. .	− 2.47	11 29 26.93	−63.44
	36	β Leonis	Sk.	32.7	35.4	36.9	43.2	45.4	47.7	53.8	55.4	58.0	42 45.39	− 0.54	− 2.47	− 2.29	11 42 42.56	+ 0.16
	37	γ Ursæ Majoris	Sk.	57.4	1.5	4.2	14.7	18.5	21.7	32.5	35.0	39.4	47 18.32	+ 0.44	. .	− 2.29	11 47 16.47	+ 0.12
	38	Polaris, S. P.	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
25	39	Sun I, N.	Sk.	34.4	37.1	38.5	45.0	47.0	49.0	55.5	57.0	59.4	57 46.99	− 0.93	. .	− 2.42	13 57 43.64	. .
	40	Sun II, S.	Sk.	46.8	49.4	50.9	57.2	59.3	1.3	7.7	9.2	11.8	59 59.29	− 0.93	. .	− 2.42	13 59 55.94	. .
	41	Venus I, N.	Sk.	16.3	19.0	20.6	. .	. .	. .	37.4	39.0	41.7	32 29.00	− 0.96	. .	− 2.41	14 32 25.63	+ 0.33
	42	Venus II, S.	Sk.	. .	. .	25.5	27.5	29.6	31.8	33.9	. .	. .	32 29.66	− 0.96	. .	− 2.41	14 32 26.29	− 0.33
	43	ε Bootis	Sk.	21.3	24.3	26.0	32.7	35.2	37.6	44.6	46.2	49.0	39 35.21	− 0.33	− 2.41	− 2.30	14 39 32.48	+ 0.08
	44	α Coronæ Borealis	Sk.	13.4	16.3	22.5	24.7	27.1	29.4	31.7	38.0	40.9	29 27.11	− 0.33	− 2.30	− 2.30	15 29 24.48	0.00
	45	α Serpentis	Sk.	58.5	0.9	2.5	8.5	10.7	12.8	19.0	20.5	23.2	38 10.73	− 0.66	− 2.32	− 2.30	15 38 7.77	+ 0.04
	46	α Scorpii	Sk.	35.9	38.8	40.5	47.3	49.7	52.0	58.8	0.5	3.4	21 49.60	− 1.14	− 2.39	− 2.30	16 21 46.22	− 0.08
	47	ζ Ophiuchi	Sk.	. .	. .	19.3	21.3	23.3	25.4	29.6	31.2	33.8	30 21.31	− 0.89	− 2.45	− 2.30	16 30 18.12	+ 0.15
	48	η Herculis	Sk.	23.7	27.0	28.9	36.8	39.5	42.2	50.0	52.0	55.2	38 39.38	− 0.07	− 2.27	− 2.30	16 38 37.01	− 0.02
	49	B. A. C. 7826	Sk.	11.2	14.3	16.4	24.4	26.9	29.7	37.5	39.4	42.9	21 26.97	− 1.44	. .	− 2.24	22 21 23.29	− 3.98

6, 27. Bisections at sets B and D.
10. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan's Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	22 40	10 11.0	8.3	16.7	11.7	34	762	670	. .	. .	. .	30.3	22 43 41.0	. .	+ 24.4	73 50 26.6	+11.3
2	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
3	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
4	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
5	9 44	7.3	5.3	14.3	8.3	33	. .	444	. .	470	. .	30.3	9 48 3.7	. .	+ 10.1	60 54 35.0	+ 5.0
6	311 36	5.3	3.5	11.0	8.3	30	485	427	. .	. .	. .	30.3	311 40 52.4	. .	− 1 5.5	2 46 8.1	+ 1.4
7	15 4	6.4	4.6	13.9	7.6	31	. .	870	. .	988	. .	30.3	15 8 27.7	. .	+ 15.8	66 15 4.7	+ 5.6
8	22 34	6.4	4.5	13.0	7.3	33	. .	125	. .	165	. .	30.3	22 38 9.4	. .	+ 24.4	73 44 55.0	+ 7.4
9	16 0	7.6	7.3	16.3	9.7	33	. .	788	. .	768	. .	30.3	16 3 57.3	. .	+ 16.8	67 10 35.3	+ 4.8
10	11 44	3.4	2.5	13.0	6.0	36	766	800	. .	. .	. .	30.3	11 49 48.0	. .	+ 12.2	62 56 21.4	+ 2.8
11	13 44	5.0	4.0	13.0	7.2	36	. .	. .	. .	195	248	30.3	13 47 23.2	. .	+ 14.4	64 53 58.8	+ 3.3
12	22 4	4.5	3.0	11.5	6.5	36	350	380	. .	. .	. .	30.3	22 7 21.2	. .	+ 23.8	73 14 6.2	+ 5.8
13	15 38	4.5	2.5	12.0	6.5	32	590	600	. .	. .	. .	30.3	15 42 19.0	. .	+ 16.4	66 48 56.6	+ 3.2
14	30 16	4.5	1.5	10.5	5.6	31	460	482	. .	. .	. .	30.3	30 20 37.0	. .	+ 34.2	81 27 32.4	+ 7.9
15	6 40	5.0	3.2	13.5	7.4	34	. .	012	. .	030	. .	30.3	6 43 56.6	. .	+ 6.9	57 50 24.7	+ 1.7
16	33 16	4.6	2.4	12.4	6.0	32	830	792	. .	. .	. .	30.3	33 20 15.6	. .	+ 38.5	84 27 15.3	− 0.6
17	10 30	3.5	2.0	11.6	6.7	34	190	250	. .	. .	. .	30.3	10 33 54.6	. .	+ 10.9	61 40 26.7	+ 1.3
18	27 44	4.7	1.5	11.6	6.3	30	769	856	. .	. .	. .	30.3	27 48 46.6	. .	+ 30.9	78 55 38.7	+ 5.6
19	307 46	5.3	1.5	11.5	8.0	29	. .	530	. .	530	. .	30.3	307 51 5.6	. .	− 1 15.2	358 56 11.6	+ 2.9
20	13 4	5.0	3.0	12.1	7.2	28	. .	. .	. .	050	150	30.3	13 9 28.1	. .	+ 13.7	64 16 3.0	− 0.7
21	24 50	5.0	1.7	12.1	6.6	37	782	798	. .	. .	. .	30.3	24 52 59.4	. .	+ 27.2	75 59 47.8	+ 2.8
22	12 56	5.1	2.2	13.0	7.9	32	. .	. .	. .	350	372	30.3	13 0 22.6	. .	+ 13.5	64 6 57.3	− 1.5
23	17 40	4.0	1.0	10.6	5.0	30	220	180	. .	. .	. .	30.3	17 44 56.9	. .	+ 18.8	68 51 36.9	− 0.6
24	20 6	1.6	9.5	10.5	4.5	36	350	366	. .	. .	. .	30.3	20 9 21.2	. .	+ 21.5	71 16 3.9	0.0
25	31 56	4.5	2.3	11.2	5.7	32	074	080	. .	. .	. .	30.3	32 0 27.2	. .	+ 36.6	83 7 25.0	+ 2.2
26	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
27	342 58	4.1	2.0	10.1	2.7	32	155	. .	. .	. .	160	30.3	343 2 27.6	. .	− 17.6	34 8 31.2	+ 2.6
28	57 28	3.0	0.4	9.1	5.0	33	240	250	. .	255	280	30.3	57 32 10.8	55.1	+ 1 30.5	108 40 2.5	+ 0.6
29	31 36	1.6	29.3	8.3	2.2	35	440	435	. .	. .	. .	30.3	31 39 39.2	. .	+ 35.6	82 46 36.0	+ 1.0
30	310 12	1.9	0.0	7.1	4.9	34	550	. .	500	. .	525	30.3	310 15 52.7	. .	− 1 8.2	1 21 5.7	+ 1.3
31	47 38	2.8	0.3	8.5	3.4	34	. .	200	. .	265	. .	30.3	47 41 56.7	. .	+ 1 3.5	98 49 21.4	+ 1.8
32	18 38	2.0	1.6	10.3	3.9	37	235	250	. .	. .	. .	30.3	18 41 9.8	. .	+ 19.6	69 47 50.6	+ 2.3
33	327 2	1.6	0.3	7.9	3.8	37	. .	850	. .	820	. .	30.3	327 5 2.9	. .	− 37.5	18 10 46.6	+ 0.3
34	15 58	3.5	1.5	10.9	5.5	38	. .	775	. .	785	. .	30.3	16 0 45.6	53.2	+ 16.6	67 7 23.4	+ 1.6
35	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
36	23 32	3.0	2.0	14.1	6.5	29	. .	. .	. .	244	238	29.8	23 37 10.6	. .	+ 25.0	74 43 56.8	+ 1.8
37	344 26	3.5	3.1	12.9	7.3	30	338	. .	. .	. .	300	29.8	344 30 52.7	58.0	− 15.9	35 36 58.0	+ 1.0
38	307 30	4.0	2.5	13.0	8.0	34	500	. .	. .	. .	540	29.8	307 33 48.2	. .	− 1 12.8	358 38 56.6	0.0
39	50 42	9 28.5	25.4	8.1	1.5	39	270	278	. .	. .	. .	29.8	50 44 41.8	73.0	+ 1 7.9	101 52 10.9	. .
40	51 12	10 4.6	29.4	12.4	6.3	30	. .	. .	. .	248	240	29.8	51 16 55.1	. .	+ 1 9.2	102 24 25.5	. .
41	53 12	6.0	2.5	14.7	7.2	36	870	. .	. .	. .	040	29.8	53 15 10.4	. .	+ 1 14.2	104 22 45.8	. .
42	53 12	6.0	2.5	14.7	7.2	36	. .	220	. .	190	. .	29.8	53 15 22.0	. .	+ 1 14.2	104 22 57.4	. .
43	11 14	3.8	2.7	14.7	6.7	35	. .	. .	. .	510	. .	29.8	11 17 33.8	. .	+ 11.1	62 24 6.1	+ 4.4
44	11 42	5.8	5.0	16.9	7.8	35	980	964	. .	. .	. .	29.8	11 45 24.3	. .	+ 11.5	61 51 57.0	+ 1.9
45	32 0	5.8	4.6	15.5	6.8	33	. .	580	. .	590	. .	29.8	32 4 1.7	. .	+ 34.6	83 10 57.5	+ 3.0
46	64 56	5.5	3.8	13.0	6.6	29	. .	450	. .	498	. .	29.8	65 1 5.4	. .	+ 1 57.7	116 9 24.3	+ 2.9
47	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
48	359 40	7.7	7.0	18.2	9.4	33	. .	. .	. .	368	488	29.8	359 44 2.4	77.1	− 0.3	50 50 23.3	+ 3.0
49	78 30	12.4	7.8	13.5	10.0	30	. .	312	. .	462	. .	29.7	78 34 47.5	. .	+ 4 34.3	129 45 43.0	+ 4.5

No.	Barom.	At. Ther.
	in.	°
28	30.03	58.4
34	30.015	56.4
37	29.96	58.0
39	29.95	67.7
48	29.92	74.2

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
39	− 6.9	+ 16 7.3	. .	+ 16 0.4
40	− 6.9	− 16 7.3	. .	− 16 14.2
41	− 4.2	+ 5.8	0.0	+ 1.6
42	− 4.2	− 5.8	. .	− 10.0

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Oct. 25	1	ζ Pegasi	Sk.	7.0	9.6	11.2	17.3	19.4	21.4	27.8	29.3	31.9	35 19.43	− 0.63	− 2.25	− 2.31	22 35 16.49	0.00
	2	λ Aquarii.	E.	59.9	2.5	4.0	10.2	12.2	14.3	20.5	22.0	24.8	46 12.27	− 1.01	− 2.49	− 2.54	22 46 8.72	− 0.03
	3	B. A. C. 7987	Sk.	54.0	57.0	58.9	6.2	8.6	11.2	18.3	20.3	23.4	49 8.66	− 1.30	. .	− 2.26	22 49 5.10	− 3.84
	4	α Piscis Australis	Sk.	37.6	40.6	42.3	49.3	51.7	53.9	1.2	3.0	5.9	50 51.72	− 1.24	− 2.30	− 2.31	22 50 48.17	+ 0.03
	5	B. A. C. 8002	Sk.	38.5	41.5	43.3	50.4	52.7	55.0	2.2	3.9	6.9	52 52.71	− 1.24	. .	− 2.26	22 52 49.21	− 3.75
	6	α Pegasi	Sk.	25.3	27.9	29.5	35.7	37.8	40.0	46.3	47.8	50.4	58 37.86	− 0.57	− 2.22	− 2.31	22 58 34.98	− 0.11
	7	ψ^1 Aquarii.	Sk.	14.7	17.2	18.7	25.0	27.1	29.2	35.4	36.9	39.6	9 27.09	− 0.92	. .	− 2.27	23 9 23.90	− 3.36
	8	B. A. C. 8113	Sk.	. .	. .	. .	. .	. .	. .	21.4	23.3	26.4	12 11.71	− 1.28	. .	− 2.27	23 12 8.16	− 3.90
	9	θ Piscium	E.	31.8	34.4	35.8	41.9	44.1	46.3	52.3	53.8	56.4	21 44.09	− 0.72	− 2.54	− 2.54	23 21 40.83	+ 0.04
	10	ι Piscium	E.	25.4	28.0	29.6	35.7	37.8	39.8	45.9	47.4	50.0	33 37.73	− 0.73	− 2.43	− 2.54	23 33 34.46	− 0.11
	11	Anonymous	Sk.	18.6	21.2	22.6	28.8	30.9	33.0	39.1	40.6	43.1	41 30.88	− 0.86	. .	− 2.28	23 41 27.74	− 3.38
	12	Weisse 839	Sk.	57.2	59.7	1.3	7.5	9.4	11.5	17.6	19.2	21.8	42 9.47	− 0.86	. .	− 2.28	23 42 6.33	− 3.37
	13	ω Piscium	E	47.7	50.3	51.8	58.0	0.2	2.3	8.4	9.8	12.5	53 0.11	− 0.71	− 2.51	− 2.54	23 52 56.86	− 0.02
	14	Weisse 1114	Sk.	19.2	21.9	23.5	29.5	31.6	33.6	39.9	41.4	43.9	55 31.61	− 0.83	. .	− 2.29	23 55 28.49	− 3.39
	15	α Andromedæ	E.	47.8	50.7	52.5	59.4	1.7	4.0	11.0	12.7	15.7	2 1.72	− 0.34	− 2.43	− 2.54	0 1 58.84	− 0.09
	16	γ Pegasi	E.	41.8	44.4	45.9	52.3	54.4	56.5	2.8	4.4	7.0	6 54.39	− 0.58	− 2.51	− 2.54	0 6 51.27	− 0.03
	17	β Ceti	E.	13.2	15.9	17.5	24.0	26.2	28.4	34.8	36.4	39.0	37 26.16	− 1.08	− 2.53	− 2.54	0 37 22.54	+ 0.04
	18	ε Piscium	E.	21.8	24.4	25.8	31.9	34.0	36.2	42.4	43.9	46.5	56 34.10	− 0.69	− 2.49	− 2.54	0 56 30.87	− 0.03
	19	Polaris	E.	. .	. .	15.0	39.5	6.0	35.0	0.0	. .	. .	13 7.10	+37.71	. .	− 2.54	1 13 42.27	− 0.70
	20	θ^1 Ceti	E.	41.2	43.8	45.3	51.5	53.6	55.7	1.9	3.4	6.0	17 53.60	− 0.93	− 2.52	− 2.54	1 17 50.13	0.00
	21	η Piscium	E.	41.7	44.4	45.9	52.3	54.4	56.4	2.9	4.5	7.0	24 54.39	− 0.58	− 2.47	− 2.54	1 24 51.27	0.00
	22	B. A. C. 528	Sk.	24.6	27.7	29.7	37.5	40.0	42.5	50.4	52.2	55.4	36 40.00	− 1.39	. .	− 2.33	1 36 36.28	− 4.02
	23	B. A. C. 536	Sk.	9.7	12.5	14.2	20.5	22.7	24.7	31.2	32.8	35.4	38 22.63	− 1.00	. .	− 2.33	1 38 19.30	− 3.67
	24	B. A. C. 553	Sk.	12.4	15.6	17.6	25.3	27.9	30.6	38.3	40.3	43.6	42 27.96	− 1.39	. .	− 2.33	1 42 24.24	− 4.01
	25	B. A. C. 578	Sk.	52.3	55.5	57.5	5.2	7.9	10.6	18.5	20.4	23.8	48 7.97	− 1.42	. .	− 2.34	1 48 4.21	− 4.03
	26	B. A. C. 609	Sk.	. .	47.0	49.0	51.0	53.0	55.1	59.3	0.9	3.3	52 50.99	− 0.61	. .	− 2.34	1 52 48.04	− 3.60
	27	Neptune	Sk.	16.4	18.9	20.4	26.6	28.7	30.8	37.0	38.5	41.0	0 28.70	− 0.63	. .	− 2.34	2 0 25.73	. .
	28	Lalande 4528	Sk.	32.7	35.2	37.0	43.3	45.3	47.5	53.9	55.5	58.2	20 45.40	− 0.54	. .	− 2.35	2 20 44.51	− 3.67
	29	B. A. C. 765	Sk.	37.0	40.2	42.0	49.4	51.9	54.4	1.7	3.6	6.9	22 51.90	− 1.32	. .	− 2.35	2 22 48.23	− 3.81
	30	B. A. C. 783	Sk.	57.9	1.0	3.0	10.8	13.3	15.8	23.5	25.4	28.6	27 13.26	− 1.37	. .	− 2.35	2 27 9.54	− 3.84
	31	B. A. C. 812	Sk.	48.5	51.2	53.1	0.3	2.6	4.9	11.9	13.9	16.8	33 2.58	− 1.25	. .	− 2.35	2 32 58.98	− 3.72
	32	B. A. C. 840	Sk.	59.7	3.0	5.0	12.9	15.5	18.3	25.9	27.8	31.3	37 15.49	− 1.42	. .	− 2.36	2 37 11.71	− 3.83
	33	B. A. C. 871	Sk.	32.9	35.9	37.9	45.5	48.3	50.7	58.6	0.5	3.7	42 48.22	− 0.13	. .	− 2.36	2 42 45.73	− 4.07
	34	ρ^2 Arietis	Sk.	40.8	43.5	45.0	51.5	53.5	55.7	2.1	3.8	6.5	48 53.60	− 0.52	. .	− 2.37	2 48 50.71	− 3.72
	35	ρ^3 Arietis	Sk.	. .	. .	. .	29.4	31.5	33.6	37.9	39.5	42.4	49 29.37	− 0.52	. .	− 2.37	2 49 26.48	− 3.71
	36	Ate	Sk.	42.9	45.8	47.7	54.5	56.6	59.2	6.1	8.2	10.7	13 56.86	− 0.37	. .	− 2.38	3 13 54.11	. .
	37	Clotho	Sk.	42.4	45.1	46.6	52.6	54.8	57.0	2.8	4.6	7.0	33 54.77	− 0.80	. .	− 2.38	3 33 51.59	. .
	38	η Tauri	Sk.	. .	. .	. .	10 1	12.2	14.4	18.9	20.4	23.3	40 9.94	− 0.42	− 2.32	− 2.32	3 40 7.20	0.00
	39	ζ Persei	Sk.	9.0	11.9	13.8	20.8	23.2	25.6	32.9	34.5	37.6	46 23.26	− 0.27	− 2.33	− 2.32	3 46 20.67	0.00
	40	γ^1 Eridani.	Sk.	6.2	8.9	10.4	16.7	18.8	20.9	27.2	28.7	31.4	52 18.80	− 0.98	− 2.52	− 2.32	3 52 15.50	+ 0.24
	41	12 Canum Venat.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	42	Polaris, S. P.	E.	9.0	18.0	27.0	54.0	26.0	58.5	27.5	34.0	44.0	14 26.44	−41.57	. .	− 2.63	1 13 42.24	− 0.65
26	43	Sun I, N.	E.	24.5	27.0	28.8	34.9	36.8	39.0	45.5	47.0	49.7	1 37.02	− 0.93	. .	− 2.64	14 1 33.45	. .
	44	Sun II, S.	E.	37.3	39.8	41.3	47.5	49.7	51.8	57.9	59.5	2.2	3 49.67	− 0.93	. .	− 2.64	14 3 46.10	. .
	45	B. A. C. 4124	F.	. .	. .	. .	27.5	29.6	31.8	36.0	37.6	40.3	9 27.48	− 0.98	. .	− 2.75	12 9 23.75	− 1.03
	46	B. A. C. 4211	F.	16.0	18.7	20.2	26.6	28.6	30.7	37.0	38.8	41.4	23 28.67	− 0.97	. .	− 2.74	12 23 24.96	− 1.02
	47	β Corvi	F.	. .	49.7	51.9	54.1	56.4	58.6	3.0	4.7	7.5	27 54.16	− 1.08	− 2.79	− 2.60	12 27 50.48	+ 0.15
	48	B. A. C. 4340	F.	10.7	13.2	14.8	20.9	23.0	25.0	31.2	32.7	35.2	49 22.97	− 0.67	. .	− 2.73	12 49 19.57	− 1.17
	49	12 Canum Venat.	F.	2.0	4.0	9.2	11.9	14.5	17.1	19.8	25.0	26.9	50 14.49	− 0.02	− 2.68	− 2.60	12 50 11.87	+ 0.08

14. Wire B used.
35, 36, 37. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	28 38	10 8.3	5.3	13.6	8.0	33	. .	530	. .	580	. .	29.7	28 42 1.4	60.0	+ 31.2	79 48 53.8	+ 1.1
2	47 4	3.4	0.0	9.5	3.2	37	. .	790	. .	800	. .	29.7	47 7 1.2	. .	+ 1 1.4	98 14 23.8	+ 1.6
3	72 0	8.0	2.3	11.2	8.1	37	. .	570	. .	595	. .	29.7	72 3 0.9	. .	+ 2 54.2	123 12 16.3	+ 8.9
4	69 4	5.2	0.9	10.2	4.8	33	. .	670	. .	685	. .	29.7	69 8 2.8	. .	+ 2 28.6	120 16 52.6	+ 0.1
5	68 54	5.1	1.7	11.4	5.2	30	. .	. .	. .	280	240	29.7	68 58 54.8	. .	+ 2 27.4	120 7 43.4	+10.1
6	24 18	9.5	6.0	15.2	8.5	38	. .	070	. .	080	. .	29.7	24 20 51.3	. .	+ 25.8	75 27 38.3	+ 1.1
7	48 34	7.2	4.0	11.2	6.0	32	. .	190	. .	240	. .	29.7	48 38 23.5	. .	+ 1 4.8	99 45 49.5	+17.0
8	72 0	14.4	8.5	16.0	13.5	36	. .	. .	. .	110	120	29.7	72 3 17.9	. .	+ 2 54.5	123 12 33.6	+10.9
9	33 8	5.4	1.8	11.2	5.2	37	. .	280	. .	330	. .	29.7	33 11 6.9	. .	+ 37.4	84 18 5.5	+ 1.6
10	33 52	4.6	1.0	9.5	5.0	35	. .	020	. .	075	. .	29.7	33 55 42.3	. .	+ 38.5	85 2 42.0	+ 0.4
11	44 26	5.7	4.2	12.4	6.0	34	372	440	. .	. .	. .	29.7	44 29 49.7	. .	+ 56.3	95 37 7.2	+19.9
12	44 12	4.6	1.4	9.0	4.0	37	. .	. .	. .	618	650	29.7	44 15 3.3	. .	+ 55.8	95 22 20.3	+20.0
13	32 38	4.5	1.5	10.7	3.7	32	. .	355	. .	370	. .	29.7	32 42 23.4	. .	+ 36.8	83 49 21.4	+ 1.5
14	42 34	6.7	3.0	12.0	6.1	32	235	275	. .	. .	. .	29.7	42 35 49.8	. .	+ 52.7	93 43 3.7	+21.0
15	10 26	4.0	3.0	11.6	6.0	37	. .	630	. .	670	. .	29.7	10 29 1.5	. .	+ 10.6	61 35 33.3	+ 1.2
16	24 20	7.5	5.0	13.3	6.8	35	. .	610	. .	610	. .	29.7	24 23 30.6	. .	+ 26.0	75 30 17.8	+ 2.0
17	57 28	4.0	0.2	10.2	4.9	33	. .	110	. .	170	. .	29.7	57 32 11.6	. .	+ 1 30.2	108 40 3.0	+ 0.7
18	31 36	4.8	1.5	10.8	5.3	35	. .	250	. .	260	. .	29.7	31 39 38.6	. .	+ 35.5	82 46 35.3	+ 0.4
19	310 12	5.4	2.3	10.4	5.3	34	560	. .	500	. .	515	29.7	310 15 49.7	. .	− 1 8.0	1 21 2.9	− 0.4
20	47 38	8.1	6.8	14.8	8.5	33	. .	670	. .	710	. .	29.7	47 41 58.5	. .	+ 1 3.3	98 49 23.0	+ 3.2
21	24 8	2.3	0.7	9.8	3.2	38	. .	850	. .	860	. .	29.7	24 10 45.1	. .	+ 25.9	75 17 32.2	+ 1.2
22	76 14	8.3	5.2	13.5	8.4	36	440	512	. .	. .	. .	29.7	76 17 15.9	. .	+ 3 52.0	127 27 29.1	+20.9
23	55 24	4.5	2.4	10.4	5.0	35	. .	170	. .	228	. .	29.7	55 27 39.4	. .	+ 1 23.7	106 35 24.3	+23.2
24	76 32	8.7	4.8	12.4	7.7	32	. .	. .	. .	180	160	29.7	76 36 22.9	. .	+ 3 57.6	127 46 41.7	+21.2
25	77 58	8.0	4.7	11.3	7.9	35	. .	. .	. .	120	182	29.7	78 1 37.7	. .	+ 4 25.6	129 12 24.5	+21.4
26	27 8	6.2	4.3	13.2	7.5	35	. .	. .	. .	740	752	29.7	27 11 29.3	. .	+ 29.7	78 18 20.2	+24.8
27	28 28	4.5	1.9	10.5	4.6	30	. .	944	. .	046	. .	29.7	28 32 44.1	. .	+ 31.4	79 39 36.7	. .
28	22 44	9.6	8.9	17.0	10.5	33	736	802	. .	. .	. .	29.7	22 47 55.2	. .	+ 24.3	73 54 40.6	+24.2
29	73 8	6.0	1.4	10.2	5.4	32	172	192	. .	. .	. .	29.7	73 12 24.8	. .	+ 3 9.2	124 21 55.2	+23.5
30	75 44	9.3	4.8	13.4	10.5	32	. .	100	. .	244	. .	29.7	75 48 21.6	. .	+ 3 44.6	126 58 27.4	+23.6
31	69 30	7.5	3.6	11.2	6.3	30	943	033	. .	. .	. .	29.7	69 34 41.7	. .	+ 2 34.0	120 43 36.9	+24.1
32	77 40	9.5	5.1	10.6	8.5	33	. .	. .	. .	626	612	29.7	77 44 0.7	. .	+ 4 19.7	128 54 41.6	+23.9
33	1 2	11.0	9.5	18.5	12.8	36	. .	810	. .	850	. .	29.7	1 5 7.4	. .	+ 1.1	52 11 29.7	+21.7
34	21 0	6.7	3.8	14.0	5.5	35	840	820	. .	. .	. .	29.7	21 3 27.7	. .	+ 22.3	72 10 11.2	+23.2
35	21 16	7.4	5.5	14.6	7.9	37	. .	. .	. .	710	734	29.7	21 21 30.9	. .	+ 22.6	72 28 14.7	+23.2
36	12 30	7.9	6.7	15.5	8.4	34	. .	038	. .	958	. .	29.7	12 36 26.9	. .	+ 13.0	63 43 1.1	− 1.2
37	39 46	7.2	3.7	13.2	6.8	36	. .	340	. .	474	. .	29.7	39 51 51.7	. .	+ 48.4	90 59 1.3	− 5.2
38	15 6	8.5	6.0	14.8	8.7	33	. .	. .	. .	408	492	29.7	15 10 2.9	. .	+ 15.7	66 16 39.8	+ 0.6
39	7 18	7.0	7.1	16.0	10.0	31	. .	250	. .	268	. .	29.7	7 22 35.5	. .	+ 7.5	58 29 4.2	+ 0.2
40	52 40	9.1	4.6	13.7	8.0	33	. .	820	. .	854	. .	29.7	52 43 56.9	51.2	+ 1 16.1	103 51 34.2	+ 3.8
41	359 50	3.8	3.2	13.0	6.0	32	. .	. .	. .	750	795	29.4	359 54 16.1	. .	− 0.1	51 0 37.2	− 0.5
42	307 30	4.9	3.6	12.8	9.7	34	580	. .	515	. .	460	29.4	307 33 47.2	. .	− 1 12.9	358 38 55.5	− 1.4
43	51 2	3.2	0.8	12.4	6.8	36	720	730	. .	. .	. .	29.4	51 5 15.6	. .	+ 1 8.7	102 12 45.5	. .
44	51 34	4.2	29.3	11.8	5.5	35	. .	. .	. .	815	885	29.4	51 37 29.4	71.5	+ 1 10.1	102 45 0.7	. .
45	55 40	9 22.7	17.4	29.1	24.6	37	. .	. .	. .	958	962	30.2	55 43 10.0	. .	+ 1 23.4	106 50 54.6	− 5.9
46	54 38	10 2.3	28.2	10.0	5.2	35	. .	702	. .	726	. .	30.2	54 41 33.6	. .	+ 1 20.2	105 49 15.0	− 6.9
47	61 30	4.5	1.2	10.8	7.4	32	. .	. .	. .	748	762	30.2	61 34 17.1	58.9	+ 1 44.7	112 42 23.0	− 0.4
48	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
49	359 50	3.1	2.5	10.2	5.2	32	. .	. .	. .	680	684	30.2	359 54 19.6	. .	− 0.1	51 0 40.7	+ 2.7

No.	Barom.	At. Ther.
	in.	°
1	29.95	62.8
40	29.94	54.4
44	29.85	67.0
47	29.83	58.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
27	− 0.1	. .	. .	− 0.1
43	− 7.0	+ 16 7.6	. .	+ 16 0.6
44	− 7.0	− 16 7.6	. .	− 16 14.6

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Oct. 26	1	B. A. C. 4367	F.	49.1	51.9	53.4	59.5	1.6	3.7	9.9	11.4	14.1	56 1.62	− 0.56	. .	− 2.73	12 55 58.33	− 1.18
	2	Polaris, S. P.	Sk.	4.0	18.0	14.0	. .	. .	. .	37.0	35.0	. .	14 25.51	−40.16	. .	− 2.48	1 13 42.87	+ 0.12
	3	Polaris, S. P.	F.	. .	. .	14.0	49.0	22.0	55.0	28.0	. .	. .	14 21.60	−40.16	. .	− 2.60	1 13 38.84	− 3.91
27	4	Sun I, N.	F.	15.4	17.9	19.5	26.0	28.1	30.3	36.4	38.0	40.5	5 28.01	− 0.92	. .	− 2.70	14 5 24.39	. .
	5	Sun II, S.	F.	28.4	30.9	32.6	39.0	41.2	43.0	49.3	50.8	53.4	7 40.96	− 0.92	. .	− 2.70	14 7 37.34	. .
	6	γ^2 Ursæ Minoris	F.	. .	. .	40.4	47.6	54.0	0.5	7.5	. .	. .	20 54.00	+ 2.10	. .	− 2.59	15 20 53.51	− 0.01
	7	α Coronæ Borealis	F.	13.5	16.5	18.1	25.0	27.4	29.7	36.5	38.3	41.0	29 27.33	− 0.29	− 2.56	− 2.59	15 29 24.45	− 0.03
	8	α Serpentis	F.	58.7	1.3	2.7	9.0	11.0	13.0	19.3	20.9	23.4	38 11.03	− 0.63	− 2.65	− 2.59	15 38 7.81	+ 0.08
	9	B. A. C. 5216	F.	16.6	19.1	20.9	27.3	29.3	31.5	37.8	39.4	42.1	40 29.33	− 0.49	. .	− 2.65	15 40 26.19	− 0.92
	10	ε Serpentis	F.	27.4	29.9	31.5	37.5	39.5	41.6	47.9	49.5	51.9	44 39.63	− 0.66	− 2.72	− 2.59	15 44 36.38	+ 0.13
	11	κ Ophiuchi	F.	37.0	39.6	41.2	47.3	49.4	51.5	57.9	59.3	1.9	51 49.46	− 0.59	− 2.63	− 2.59	16 51 46.28	+ 0.08
	12	ε Ursæ Minoris	F.	. .	. .	. .	. .	. .	7.4	36.9	48.2	7.8	58 36.70	+ 6.01	. .	− 2.59	16 58 40.12	+ 0.32
	13	α Herculis	F.	48.4	51.0	52.6	59.0	1.0	3.1	9.5	11.0	13.7	9 1.03	− 0.51	− 2.52	− 2.50	17 8 57.93	− 0.05
	14	β Draconis	F.	18.3	22.6	25.1	35.0	38.4	41.8	51.8	54.2	58.7	27 38.43	+ 0.41	. .	− 2.59	17 27 36.25	+ 0.12
	15	α Ophiuchi	F.	59.8	2.4	4.0	10.2	12.3	14.3	20.7	22.2	24.9	29 12.31	− 0.54	− 2.61	− 2.59	17 29 9.18	+ 0.05
	16	Tran. Zones 182, 75	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	17	O. Arg. S. 21249	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	18	β Aquarii	F.	52.6	55.2	56.7	2.9	4.9	7.0	13.0	14.6	17.1	25 4.89	− 0.84	− 2.59	− 2.59	21 25 1.46	+ 0.03
	19	Saturn I, S.	F.	0.4	3.0	4.6	. .	. .	. .	21.6	23.1	25.7	29 13.07	− 1.00	. .	− 2.56	21 29 9.51	. .
	20	Saturn II, N.	F.	. .	. .	10.0	12.2	14.3	16.5	18.7	. .	. .	29 14.34	− 1.00	. .	− 2.56	21 29 10.78	. .
	21	ε Pegasi	F.	56.2	58.7	0.2	6.4	8.5	10.6	16.7	18.3	20.9	38 8.50	− 0.60	− 2.52	− 2.58	21 38 5.32	− 0.05
	22	μ Capricorni	F.	22.8	25.4	26.9	33.2	35.4	37.5	43.9	45.4	48.0	46 35.39	− 0.96	− 2.56	− 2.58	21 46 31.85	+ 0.01
	23	79 Draconis	F.	37.4	46.0	51.3	12.1	19.4	26.5	47.5	52.7	1.6	50 19.39	+ 2.22	. .	− 2.58	21 51 19.03	− 0.06
	24	α Aquarii	F.	15.8	18.4	19.8	25.9	28.0	30.0	36.2	37.6	40.2	59 27.99	− 0.76	− 2.57	− 2.58	21 59 24.65	+ 0.02
	25	Mural Zones 207, 63	F.	31.5	34.0	35.6	42.1	44.3	46.6	52.8	54.4	57.0	1 44.26	− 1.00	. .	− 2.56	22 1 40.70	− 3.19
	26	Anonymous	F.	49.3	51.7	57.7	59.7	2.0	4.1	6.3	12.1	14.6	13 1.94	− 1.00	. .	− 2.56	22 12 58.38	− 3.22
	27	Lalande 43567	F.	. .	49.2	51.3	53.4	55.5	57.7	1.9	3.5	6.2	13 53.44	− 0.98	. .	− 2.56	22 13 49.90	− 3.20
	28	Lalande 43596	F.	44.6	47.1	48.7	55.0	57.1	59.4	5.7	7.2	9.9	14 57.19	− 0.98	. .	− 2.56	22 14 53.65	− 3.20
	29	226 Cephei	F.	15.7	26.5	32.0	56.8	5.0	13.4	38.1	44.0	54.6	30 5.12	+ 2.76	. .	− 2.58	22 30 5.30	− 0.30
	30	ζ Pegasi	F.	7.3	9.8	11.3	17.7	19.6	21.6	27.9	29.6	32.2	35 19.67	− 0.59	− 2.55	− 2.58	22 35 16.50	+ 0.03
	31	ι Cephei	F.	47.7	54.0	57.5	12.4	17.5	22.4	37.3	40.7	47.0	45 17.39	+ 1.23	. .	− 2.58	22 45 16.04	− 0.04
	32	λ Aquarii	F.	. .	. .	. .	. .	. .	16.3	20.5	22.0	24.6	46 12.21	− 0.87	− 2.59	− 2.58	22 46 8.76	+ 0.09
	33	α Piscis Australis	F.	37.8	40.8	42.6	49.6	52.0	54.4	1.4	3.2	6.2	50 52.00	− 1.25	− 2.59	− 2.58	22 50 48.17	+ 0.05
	34	α Pegasi	F.	25.6	28.2	29.8	36.0	38.1	40.3	46.6	48.2	50.8	58 38.18	− 0.51	− 2.62	− 2.58	22 58 35.09	+ 0.07
	35	B. A. C. 8102	F.	16.6	19.2	20.6	26.8	28.9	31.6	37.3	38.7	41.3	10 28.93	− 0.87	. .	− 2.57	23 10 25.49	− 3.30
	36	θ Piscium	E.	31.7	34.3	36.0	41.9	44.0	46.1	52.3	53.8	56.4	21 44.06	− 0.66	− 2.59	− 2.70	23 21 40.70	− 0.05
	37	ι Piscium	E.	25.5	28.0	29.6	35.6	37.7	39.7	46.0	47.4	50.1	33 37.73	− 0.67	− 2.51	− 2.70	23 33 34.36	− 0.19
	38	ω Piscium	E.	47.9	50.4	52.0	58.1	0.1	2.2	8.4	9.9	12.6	53 0.18	− 0.65	− 2.64	− 2.70	23 52 56.83	− 0.05
	39	α Andromedæ	E.	48.0	50.8	52.5	59.4	1.8	4.2	11.0	13.0	15.8	2 1.83	− 0.26	− 2.63	− 2.70	0 1 58.87	− 0.05
	40	γ Pegasi	E.	41.8	44.4	46.0	52.4	54.5	56.5	2.9	4.4	7.2	6 54.46	− 0.52	− 2.65	− 2.70	0 6 51.24	− 0.05
	41	Weisse 753	F.	. .	39.2	41.1	43.1	45.5	47.5	51.4	53.1	. .	44 43.26	− 0.70	. .	− 2.57	0 44 39.99	− 3.47
	42	Schjellerup 337	F.	46.3	48.9	50.5	56.5	58.6	0.8	7.0	8.3	11.2	51 58.68	− 0.69	. .	− 2.57	0 51 55.42	− 3.48
	43	Durch. 3°, 133.	F.	12.5	14.0	18.0	20.0	22.0	24.1	26.1	30.2	31.7	52 22.07	− 0.69	. .	− 2.57	0 52 18.81	− 3.48
	44	Lalande 1799	F.	48.7	51.2	53.0	59.0	1.1	3.2	9.2	10.9	13.5	56 1.09	− 0.68	. .	− 2.57	0 55 57.84	− 3.49
	45	B. A. C. 303	F.	18.6	21.2	22.7	28.9	30.9	33.0	39.0	40.7	43.2	58 30.91	− 0.67	. .	− 2.57	0 58 27.67	− 3.49
	46	Polaris	F.	. .	. .	. .	. .	. .	. .	50.0	. .	44.0	13 3.80	+37.78	. .	− 2.57	1 13 39.01	− 3.68
	47	η Piscium	F.	41.9	44.5	46.0	52.3	54.5	56.6	3.0	4.6	7.0	24 54.49	− 0.52	− 2.62	− 2.57	1 24 51.40	+ 0.12
	48	Weisse 791^2	F.	18.4	21.2	22.7	28.9	31.1	33.1	39.4	41.0	43.6	45 31.04	− 0.59	. .	− 2.58	1 45 27.87	− 3.59
	49	Neptune	F.	3.9	6.4	7.9	14.1	16.2	18.3	24.4	26.1	28.7	0 16.22	− 0.58	. .	− 2.58	2 0 13.06	. .
	50	B. A. C. 765	F.	37.4	40.5	42.3	49.7	52.2	54.5	2.1	3.9	7.2	22 52.20	− 1.34	. .	− 2.58	2 22 48.28	− 3.82

6, 9, 12, 23, 29, 31, 46. Bisections at sets B and D.
16, 28, 42. Wire B used.
17, 27, 43. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Mscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	27 12	10 1.5	29.5	8.4	4.7	36	064	100	. .	. .	. .	30.2	27 15 28.3	. .	+ 29.3	78 22 18.8	−11.8
2	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
3	307 30	5.2	4.7	11.6	9.5	34	. .	430	384	410	. .	30.2	307 33 49.8	59.8	− 1 13.8	358 38 57.2	0.0
4	51 22	6.5	5.5	15.2	7.5	34	996	020	. .	. .	. .	30.2	51 25 39.7	60.0	+ 1 11.1	102 33 12.0	. .
5	51 54	3.3	1.5	13.4	5.0	34	. .	. .	. .	310	310	30.2	51 57 53.1	. .	+ 1 12.5	103 5 26.8	. .
6	326 34	3.0	0.3	9.8	5.7	34	. .	986	. .	996	. .	30.2	326 37 44.1	. .	− 37.5	17 43 27.8	+ 1.6
7	11 42	3.0	0.3	11.2	4.9	36	328	334	. .	344	354	30.2	11 45 23.5	. .	+ 11.9	62 51 56.6	+ 1.1
8	32 0	4.0	1.6	11.8	5.8	33	. .	948	. .	948	. .	30.2	32 3 58.9	. .	+ 35.7	83 10 55.8	+ 1.1
9	23 0	7.1	5.8	16.4	10.0	31	500	. .	. .	. .	508	30.2	23 4 32.3	. .	+ 24.3	74 11 17.8	− 8.1
10	33 58	3.2	0.2	10.9	6.1	34	. .	550	. .	600	. .	30.2	34 1 50.0	. .	+ 38.5	85 8 49.7	+ 1.2
11	29 14	3.8	0.9	11.9	6.0	30	092	100	. .	122	128	30.2	29 18 57.9	. .	+ 32.0	80 25 51.1	+ 3.3
12	316 36	2.9	0.8	9.2	6.1	33	. .	. .	. .	282	320	30.2	316 40 10.4	. .	− 53.9	7 45 37.7	+ 0.3
13	24 18	2.0	0.3	11.2	4.4	37	038	050	. .	104	104	30.2	24 21 12.5	. .	+ 25.9	75 27 59.6	+ 1.8
14	346 36	2.5	29.8	9.2	4.7	33	. .	458	. .	500	. .	30.2	346 40 8.2	. .	− 13.6	37 46 15.8	− 0.2
15	26 10	6.0	4.6	14.5	9.8	33	. .	450	. .	456	. .	30.2	26 14 3.6	56.5	+ 28.2	77 20 53.0	+ 1.8
16	60 42	14.7	12.1	22.5	18.5	44	. .	. .	. .	664	672	31.7	60 40 32.5	. .	+ 1 44.0	111 48 37.7	+ 4.0
17	60 42	14.7	12.1	22.5	18.5	30	. .	. .	. .	430	440	31.7	60 49 16.0	. .	+ 1 44.6	111 57 21.8	+ 4.0
18	44 56	2.4	29.0	9.1	4.2	35	. .	322	. .	322	. .	31.7	44 59 41.5	. .	+ 58.6	96 7 1.3	+ 1.4
19	55 8	1.5	27.8	6.7	3.7	36	274	. .	. .	. .	376	31.7	55 11 27.2	. .	+ 1 24.2	106 19 12.6	. .
20	55 8	1.5	27.8	6.7	3.7	37	. .	408	. .	432	. .	31.7	55 11 10.5	. .	+ 1 24.2	106 18 55.9	. .
21	29 30	6.8	4.1	13.9	8.8	31	. .	. .	. .	206	224	31.7	29 34 40.2	46.2	+ 33.3	80 41 34.7	+ 2.3
22	52 56	1.1	27.3	8.0	3.2	32	. .	050	. .	060	. .	31.7	53 0 32.7	. .	+ 1 17.8	104 8 11.7	+ 2.2
23	325 44	9 28.0	25.2	4.8	1.1	37	430	448	. .	466	442	31.7	325 47 13.1	. .	− 39.9	16 52 54.4	+ 0.7
24	39 44	10 0.2	26.3	7.5	2.2	33	. .	. .	. .	682	698	31.7	39 48 8.9	. .	+ 49.0	90 55 19.1	0.0
25	55 56	9 28.7	25.3	6.0	0.8	29	. .	. .	. .	342	372	31.7	56 1 16.5	. .	+ 1 27.0	107 9 4.7	+ 9.8
26	54 58	10 4.0	0.1	10.7	6.1	36	638	668	. .	. .	. .	31.7	55 1 19.1	. .	+ 1 23.8	106 9 4.1	+11.0
27	53 56	9.1	14.3	3.8	8.8	32	. .	. .	. .	056	048	31.7	54 2 59.3	. .	+ 1 21.0	105 10 41.5	+11.4
28	53 56	9.1	14.3	3.8	8.8	34	. .	. .	. .	635	628	31.7	53 57 14.2	. .	+ 1 20.7	105 4 56.1	+11.5
29	323 16	1.7	29.6	7.2	5.5	38	. .	082	. .	060	. .	31.7	323 18 59.7	. .	− 43.8	14 24 37.1	+ 1.1
30	28 38	9 27.6	25.6	5.7	0.9	34	. .	256	. .	264	. .	31.7	28 42 1.5	45.0	+ 32.2	79 48 54.9	+ 2.2
31	333 18	10 1.1	28.0	8.1	5.0	37	. .	720	. .	710	. .	31.7	333 21 5.6	. .	− 29.6	24 26 57.2	+ 1.0
32	47 4	9 26.0	23.3	3.0	28.9	38	. .	. .	. .	430	446	31.7	47 6 59.9	. .	+ 1 3.4	98 14 24.5	+ 2.2
33	69 4	10 2.5	27.9	7.5	4.4	34	. .	252	. .	260	. .	31.7	69 7 58.2	. .	+ 2 33.5	120 16 52.9	+ 0.2
34	24 18	3.2	29.3	10.0	4.9	38	. .	536	. .	554	. .	31.7	24 20 51.6	44.5	+ 26.7	75 27 39.5	+ 2.3
35	47 14	1.5	27.5	7.3	3.6	38	. .	972	. .	994	. .	31.7	47 16 46.6	. .	+ 1 3.8	98 24 11.6	+17.4
36	33 8	9 29.2	26.5	7.5	2.6	37	. .	845	. .	875	. .	31.7	33 11 4.9	. .	+ 38.6	84 18 4.7	+ 0.8
37	33 52	29.6	27.8	8.0	3.0	35	. .	400	. .	430	. .	31.7	33 55 41.7	. .	+ 39.7	85 2 42.6	+ 1.0
38	32 38	10 0.0	27.8	8.5	2.5	32	. .	700	. .	725	. .	31.7	32 42 23.0	. .	+ 38.0	83 49 22.2	+ 2.3
39	10 26	1.3	1.3	10.4	5.0	37	. .	810	. .	840	. .	31.7	10 29 2.5	. .	+ 11.0	61 35 34.7	+ 2.9
40	24 20	9 29.6	2.0	12.5	7.0	35	. .	920	. .	950	. .	31.7	24 23 30.6	. .	+ 26.8	75 30 18.6	+ 2.9
41	36 2	10 1.0	27.8	7.6	3.2	37	. .	. .	. .	774	780	31.7	36 5 5.6	. .	+ 43.2	87 12 10.0	+23.8
42	35 14	0.2	27.8	8.1	3.2	34	694	720	. .	. .	. .	31.7	35 15 19.0	. .	+ 41.9	86 22 22.1	+24.1
43	35 14	0.2	27.8	8.1	3.2	33	. .	. .	. .	514	536	31.7	35 20 43.6	. .	+ 42.1	86 27 46.9	+24 1
44	34 28	9 29.0	26.0	8.2	0.4	43	184	194	. .	. .	. .	31.7	34 29 43.5	. .	+ 40.8	85 36 45.5	+24.2
45	33 48	28.8	25.9	7.2	2.4	28	. .	702	. .	702	. .	31.7	33 53 25.5	. .	+ 39.9	85 0 26.6	+24.4
46	310 12	10 2.5	0.3	9.4	6.3	34	. .	. .	. .	. .	648	31.7	310 15 54.3	. .	− 1 10.0	1 21 5.5	+ 2.9
47	24 8	0.2	27.2	8.1	3.0	39	. .	122	. .	130	. .	31.7	24 10 44.9	41.2	+ 26.7	75 17 32.8	+ 1.9
48	28 38	9 28.0	26.0	6.7	1.5	37	. .	624	. .	628	. .	31.7	28 41 9.4	. .	+ 32.6	79 48 3.2	+24.9
49	28 30	10 2.5	1.3	10.2	5.4	34	. .	. .	. .	528	548	31.7	28 33 52.8	. .	+ 32.4	79 40 46.4	. .
50	73 8	2.1	26.2	7.0	3.6	32	. .	874	. .	930	. .	31.7	73 12 19.8	40.2	+ 3 15.2	124 21 56.2	+23.1

No.	Barom.	At. Ther.
	in.	°
3	29.85	59.5
4	29.84	59.0
15	29.88	58.5
21	29.99	50.0
30	30.02	48.5
34	30.03	48.5
47	30.05	47.0
50	30.09	46.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
4	− 7.0	+ 16 7.4	. .	+ 16 0.4
5	− 7.0	− 16 7.4	. .	− 16 14.4
19	− 0.8	− 8.4	. .	− 9.2
20	− 0.8	+ 8.3	. .	+ 7.5
49	− 0.1	. . .	. .	− 0.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Oct. 27	1	B. A. C. 832	F.	36.0	39.4	41.4	49.3	52.0	54.6	2.9	4.8	8.1	35 32.06	— 1.48	. .	— 2.58	2 35 48.00	— 3.88
	2	B. A. C. 840	F.	. .	10.6	13.2	16.0	18.6	21.0	26.3	28.3	31.7	37 15.88	— 1.44	. .	— 2.58	2 37 11.86	— 3.85
	3	B. A. C. 872	F.	30.8	33.8	35.5	42.2	44.5	46.9	53.8	55.5	58.3	42 44.59	— 0.30	. .	— 2.58	2 42 41.71	— 3.86
	4	β Ursæ Minoris, S. P.	F.	. .	. .	24.7	17.0	9.6	1.9	54.0	. .	. .	51 9.44	— 4.10	. .	— 2.57	14 51 2.77	+ 0.75
	5	B. A. C. 937	F.	23.2	26.6	28.6	. .	. .	. .	49.9	52.2	55.5	53 39.33	— 1.49	. .	— 2.58	2 53 35.26	— 3.80
	6	B. A. C. 938	F.	. .	. .	34.8	37.5	40.3	43.0	45.5	. .	. .	53 40.22	— 1.49	. .	— 2.58	2 53 36.15	— 3.80
	7	α Ceti	F.	. .	. .	47.6	49.6	51.7	53.8	55.9	. .	. .	55 51.72	— 0.69	— 2.60	— 2.57	2 55 48.46	+ 0.05
	8	ζ Arietis	F.	36.9	39.6	41.2	47.7	50.0	52.2	58.6	0.3	3.0	7 49.94	— 0.41	— 2.63	— 2.57	3 7 46.96	+ 0.02
	9	Ate	F.	59.5	2.3	4.0	11.0	13.5	15.6	22.2	24.1	26.8	12 13.22	— 0.31	. .	— 2.58	3 12 10.33	. .
	10	B. A. C. 1052	F.	49.1	51.9	53.5	0.5	2.7	4.9	11.6	13.2	16.0	17 2.60	— 0.34	. .	— 2.58	3 16 59.68	— 3.87
	11	η Tauri	F.	56.8	59.6	1.2	7.9	10.2	12.4	19.0	20.8	23.6	40 10.17	— 0.36	— 2.57	— 2.57	3 40 7.24	0.00
	12	ζ Persei	F.	. .	. .	. .	. .	. .	. .	33.0	34.8	37.9	46 23.45	— 0.20	— 2.55	— 2.57	3 46 20.68	— 0.03
	13	12 Canum Venat.	P.	58.6	1.8	3.9	11.8	14.4	17.0	24.9	26.9	30.2	50 14.39	— 0.08	— 2.51	— 2.43	12 50 11.88	+ 0.08
	14	Polaris, S. P.	P.	. .	15.0	17.0	. .	24.0	. .	28.0	33.0	. .	14 23.23	—40.23	. .	— 2.42	1 13 40.58	— 2.07
	15	Polaris, S. P.	Sk.	3.0	. .	. .	48.0	. .	54.5	. .	34.5	44.0	14 22.20	—40.23	. .	— 2.34	1 13 39.63	— 3.02
	16	α Virginis	P.	28.6	31.3	32.9	39.2	41.2	43.3	49.4	50.9	53.5	18 41.14	— 0.97	— 2.55	— 2.42	13 18 37.75	+ 0.11
	17	ζ Virginis	P.	11.7	14.2	15.7	21.7	23.9	26.0	32.1	33.6	36.1	28 23.89	— 0.81	— 2.52	— 2.42	13 28 20.66	+ 0.10
	18	η Ursæ Majoris	P.	20.5	24.6	26.8	36.4	39.6	42.7	52.2	54.4	58.6	42 39.53	+ 0.25	. .	— 2.42	13 42 37.36	0.00
	19	η Bootis	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
28	20	Sun I, N.	P.	7.2	9.8	11.5	17.6	19.9	22.0	28.3	29.7	32.5	9 19.83	— 1.01	. .	— 2.48	14 9 16.34	. .
	21	Sun II, S.	P.	20.0	22.7	24.3	30.5	32.4	34.8	40.9	42.6	45.2	11 32.60	— 1.01	. .	— 2.48	14 11 29.11	. .
	22	Venus I, N.	P.	56.5	59.3	0.8	7.3	9.2	11.5	17.8	19.5	22.3	47 9.36	— 1.06	. .	— 2.45	14 47 5.85	+ 0.35
	23	Venus, S.	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	24	β Ursæ Minoris	P.	. .	. .	. .	. .	. .	. .	32.6	38.3	48.4	51 1.53	+ 2.52	. .	— 2.42	14 51 1.63	— 0.38
	25	α Coronæ Borealis	P.	13.4	16.3	18.1	24.9	27.3	29.6	36.4	38.2	41.0	29 27.24	— 0.36	— 2.40	— 2.42	15 29 24.46	— 0.02
	26	α Serpentis	P.	58.5	1.2	2.7	8.8	10.8	13.0	19.1	20.6	23.3	38 10.89	— 0.70	— 2.44	— 2.42	15 38 7.77	+ 0.04
	27	ζ Pegasi (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	28	ζ Pegasi	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	29	λ Aquarii	P.	59.8	2.3	3.8	10.1	12.1	14.1	20.4	21.9	24.5	46 12.11	— 0.90	— 2.47	— 2.40	22 46 8.81	+ 0.15
	30	α Piscis Australis	P.	37.9	40.6	42.5	49.7	51.9	54.3	1.4	3.2	6.2	50 51.97	— 1.29	— 2.53	— 2.40	22 50 48.28	+ 0.17
	31	α Pegasi	P.	25.3	27.8	29.5	35.8	37.8	40.0	46.4	48.0	50.7	58 37.92	— 0.53	— 2.35	— 2.40	22 58 34.99	— 0.02
	32	Lalande 45562	P.	23.7	26.3	27.9	34.0	36.1	38.3	44.5	46.0	48.5	10 36.14	— 0.89	. .	— 2.44	23 10 32.81	— 3.28
	33	ο Cephei	P.	1.7	8.3	12.2	28.0	33.3	38.6	54.7	58.5	5.4	13 33.41	+ 1.49	. .	— 2.40	23 13 32.50	— 0.15
	34	θ Piscium	P.	31.6	34.2	35.7	41.8	43.9	46.0	52.0	53.6	56.2	21 43.89	— 0.68	— 2.40	— 2.40	23 21 40.81	+ 0.06
	35	ι Piscium	P.	25.3	27.9	29.4	35.6	37.5	39.6	45.8	47.3	49.9	33 37.59	— 0.69	— 2.35	— 2.40	23 33 34.50	— 0.05
	36	Anonymous	P.	8.0	10.7	12.2	18.5	20.6	22.5	28.7	30.2	32.6	41 20.44	— 0.85	. .	— 2.43	23 41 17.16	— 3.35
	37	Weisse 848	P.	14.5	17.0	18.6	24.8	26.8	28.8	35.0	36.6	39.2	42 26.81	— 0.85	. .	— 2.43	23 42 23.53	— 3.36
	38	ω Piscium	P.	47.6	50.2	51.8	57.8	59.9	2.0	8.3	9.7	12.3	52 59.96	— 0.67	— 2.41	— 2.40	23 52 56.89	+ 0.02
	39	B. A. C. 8343	P.	. .	. .	. .	. .	. .	. .	35.3	37.3	40.7	55 24.50	— 1.54	. .	— 2.42	23 55 20.54	— 4.21
	40	α Andromedæ	P.	47.7	50.5	52.3	59.3	1.5	3.9	10.8	12.5	15.4	2 1.54	— 0.28	— 2.32	— 2.40	0 1 58.86	— 0.06
	41	γ Pegasi	P.	41.6	44.2	45.8	52.1	54.2	56.4	2.7	4.2	6.9	6 54.23	— 0.54	— 2.40	— 2.40	0 6 51.29	0.00
	42	α Cassiopeæ (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	43	α Cassiopeæ	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	44	β Ceti	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	45	Weisse 753	P.	30.6	33.2	34.7	40.8	42.9	45.0	51.2	52.8	55.3	44 42.94	— 0.73	. .	— 2.41	0 44 39.80	— 3.47
	46	B. A. C. 237	P.	. .	. .	. .	. .	0.9	3.0	6.9	8.5	11.3	44 58.85	— 0.73	. .	— 2.41	0 44 55.71	— 3.47
	47	Lalande 1799	P.	48.7	51.2	52.7	58.8	0.9	3.0	9.0	10.5	13.2	56 0.91	— 0.70	. .	— 2.41	0 55 57.80	— 3.49
	48	Weisse 982	P.	. .	15.5	17.5	19.7	21.7	23.8	27.9	29.5	32.0	57 19.67	— 0.70	. .	— 2.41	0 57 16.56	— 3.49
	49	B. A. C. 362	P.	22.3	25.2	27.0	34.2	36.5	38.8	46.0	47.8	50.8	6 36.51	— 1.32	. .	— 2.40	1 6 32.79	— 3.93
	50	Polaris	P.	. .	. .	10.0	36.0	3.0	30.0	55.0	. .	. .	13 2.80	+40.92	. .	— 2.40	1 13 41.32	— 1.29

4. Bisections at set D.
9, 46. Wire A used.
37, 47. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	79 8	10 2.5	26.9	6.6	3.0	35	. .	518	. .	. .	. .	31.7	79 11 39.9	. .	+ 5 3.5	130 23 4.6	+23.2
2	77 40	1.1	26.0	5.3	2.5	34	. .	. .	. .	808	824	31.7	77 43 51.6	. .	+ 4 28.0	128 54 40.8	+23.4
3	12 4	9 25.8	25.2	5.8	0.2	32	. .	720	. .	742	. .	31.7	12 8 25.8	. .	+ 12.8	63 14 59.8	+23.0
4	293 32	10 4.1	0.4	9.3	4.6	35	. .	. .	. .	270	264	31.7	293 35 41.3	. .	− 2 15.9	344 39 46.6	+ 3.0
5	79 32	7.4	0.7	10.2	7.1	32	388	380	. .	. .	. .	31.7	79 36 23.0	. .	+ 5 15.2	130 47 59.4	+23.9
6	79 32	7.4	0.7	10.2	7.1	32	. .	. .	. .	410	440	31.7	79 36 23.1	. .	+ 5 15.2	130 47 59.5	+23.9
7	35 12	2.5	28.0	8.0	3.0	31	. .	. .	. .	586	590	31.7	35 16 39.8	. .	+ 42.2	86 23 43.2	− 0.1
8	18 14	3.9	1.3	11.6	6.8	33	344	362	. .	. .	. .	31.7	18 18 9.3	. .	+ 19.8	69 24 50.3	+ 0.6
9	12 34	4.0	29.9	11.0	6.6	33	. .	. .	. .	602	584	31.7	12 40 39.7	. .	+ 13.4	63 47 14.3	− 1.3
10	14 32	3.5	29.6	11.3	5.5	33	. .	056	. .	074	. .	31.7	14 36 14.9	. .	+ 15.6	65 42 51.7	+21.3
11	15 6	5.0	1.7	12.8	7.7	33	. .	. .	. .	796	822	31.7	15 10 2.1	. .	+ 16.2	66 16 39.5	+ 0.4
12	7 18	0.2	28.6	8.4	3.6	31	. .	. .	. .	874	902	31.7	7 22 35.7	38.8	+ 7.7	58 29 4.6	+ 0.8
13	359 50	0.0	28.0	9.6	4.2	32	. .	935	. .	945	. .	31.0	359 54 18.2	51.3	− 0.1	51 0 39.3	+ 1.0
14	307 30	9 29.5	27.2	8.1	6.3	34	610	. .	655	. .	680	31.0	307 33 51.7	. .	− 1 15.7	358 38 57.2	− 0.4
15	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
16	49 18	10 0.7	28.4	9.0	3.5	29	. .	. .	. .	590	565	31.0	49 23 9.7	. .	+ 1 7.9	100 30 38.8	+ 0.4
17	38 46	1.7	28.0	11.1	5.5	32	. .	. .	. .	270	. .	31.0	38 50 27.3	53.3	+ 46.9	89 57 35.4	+ 3.9
18	348 54	9 27.0	24.2	5.7	2.6	34	. .	750	. .	780	. .	31.0	348 57 53.5	. .	− 11.3	40 4 3.4	+ 2.0
19	19 48	10 3.2	28.9	12.4	7.3	33	670	685	. .	. .	. .	31.0	19 52 3.4	. .	+ 21.0	70 58 45.6	+ 4.3
20	51 42	9 29.5	25.0	7.5	2.0	34	750	755	. .	. .	. .	31.0	51 45 52.1	. .	+ 1 13.3	102 53 26.6	. .
21	52 14	29.0	25.5	7.5	1.6	33	. .	. .	. .	615	570	31.0	52 18 9.8	56.2	+ 1 14.7	103 25 45.7	. .
22	54 26	29.2	26.4	9.2	2.9	33	220	. .	. .	. .	190	28.0	54 30 11.7	. .	+ 1 20.6	105 37 53.5	. .
23	54 26	29.2	26.4	9.2	2.9	32	. .	595	. .	580	. .	28.0	54 30 21.3	. .	+ 1 20.6	105 38 3.1	. .
24	324 10	28.0	26.4	7.9	4.1	31	. .	. .	. .	665	. .	28.0	324 14 37.3	. .	− 41.4	15 20 17.1	+ 0.5
25	11 42	10 3.5	0.4	12.2	7.1	36	160	125	. .	140	130	28.0	11 45 23.4	60.2	+ 11.9	62 51 56.5	+ 0.7
26	32 0	9 29.9	25.4	7.9	2.8	34	. .	110	. .	140	. .	28.0	32 3 58.3	. .	+ 35.8	83 10 55.3	+ 0.4
27	151 14	10 2.7	0.4	9.0	5.3	34	030	045	. .	. .	. .	30.4	151 17 58.7	53.9	− 31.7	79 48 54.2	+ 1.5
28	28 38	4.0	1.0	10.9	5.5	33	. .	. .	. .	875	850	30.4	28 42 1.2	. .	+ 31.7	79 48 54.1	+ 1.4
29	47 4	9 29.3	26.2	7.3	2.3	38	050	030	. .	. .	. .	30.4	47 7 0.5	. .	+ 1 2.2	98 14 23.9	+ 1.6
30	69 4	10 1.5	27.4	6.8	2.9	33	920	945	. .	. .	. .	30.4	69 8 2.3	. .	+ 2 30.5	120 16 54.0	+ 1.1
31	24 18	2.4	29.7	9.3	3.9	38	450	440	. .	. .	. .	30.4	24 20 52.0	. .	+ 26.2	75 27 39.4	+ 2.3
32	46 40	9 28.6	24.8	5.4	0.8	38	130	120	. .	. .	. .	30.4	46 43 0.6	. .	+ 1 1.3	97 50 23.1	+17.5
33	331 24	29.6	27.5	7.1	3.1	34	. .	. .	. .	050	160	30.4	331 28 2.2	. .	− 31.4	22 33 52.0	− 0.2
34	33 8	10 2.8	29.3	9.1	5.2	37	460	450	. .	450	465	30.4	33 11 7.1	. .	+ 37.8	84 18 6.1	+ 2.2
35	33 52	1.2	27.9	8.9	3.5	35	145	120	. .	165	190	30.4	33 55 43.5	. .	+ 38.9	85 2 43.6	+ 2.0
36	43 58	1.7	27.9	8.5	2.5	34	840	860	. .	. .	. .	30.4	44 1 48.0	. .	+ 55.8	95 9 5.0	+19.9
37	43 58	1.7	27.9	8.5	2.5	31	. .	. .	. .	065	035	30.4	44 0 14.2	. .	+ 55.8	95 7 31.2	+19.9
38	32 38	1.5	28.5	8.5	2.5	32	515	510	. .	. .	. .	30.4	32 42 23.8	. .	+ 37.1	83 49 22.1	+ 2.2
39	79 36	4.2	0.9	8.4	4.8	37	. .	. .	. .	720	770	30.4	79 39 2.0	. .	+ 5 6.1	130 50 29.3	+12.1
40	10 26	0.6	29.2	10.0	4.3	37	865	835	. .	830	865	30.4	10 29 1.9	. .	+ 10.7	61 35 33.8	+ 2.1
41	24 20	9 29.8	26.7	7.3	1.7	36	100	095	. .	160	190	30.4	24 23 30.1	54.0	+ 26.2	75 30 17.5	+ 1.9
42	196 54	10 2.4	0.3	9.0	2.5	35	330	375	. .	. .	. .	30.4	196 57 38.7	. .	+ 17.6	34 8 24.9	− 2.1
43	342 58	1.6	28.5	8.9	3.3	32	. .	. .	. .	515	560	30.4	343 2 24.5	. .	− 17.6	34 8 28.1	+ 1.1
44	57 28	1.0	28.5	8.5	4.1	33	. .	. .	. .	275	230	30.4	57 32 12.6	. .	+ 1 30.6	108 40 4.4	+ 1.7
45	36 2	1.0	27.9	8.3	2.8	37	. .	540	. .	. .	. .	30.4	36 5 7.1	. .	+ 42.1	87 12 10.4	+23.8
46	36 2	1.0	27.9	8.3	2.8	27	. .	. .	. .	. .	755	30.4	36 10 10.4	. .	+ 42.2	87 17 13.8	+23.8
47	34 28	1.3	28.0	8.3	3.5	32	760	790	. .	. .	. .	30.4	34 29 46.8	. .	+ 39.7	85 36 47.7	+24.2
48	34 16	2.8	28.0	9.5	4.3	38	. .	. .	. .	865	880	30.4	34 18 46.2	. .	+ 39.4	85 25 46.8	+24.3
49	70 14	0.2	26.4	6.0	2.5	32	050	070	. .	. .	. .	30.4	70 18 31.8	. .	+ 2 39.9	121 27 32.9	+19.3
50	310 12	3.2	0.8	9.1	6.1	34	680	640	600	640	670	30.4	310 15 49.5	. .	− 1 8.1	1 21 2.6	+ 0.3

No.	Barom.	At. Ther.
	in.	°
12	30.10	43.2
13	30.19	51.0
17	30.18	52.5
21	30.16	54.8
25	30.11	58.8
27	30.02	55.3
41	30.00	55.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
20	− 7.0	+ 16 9.5	. .	+ 16 2.5
21	− 7.1	− 16 9.5	. .	− 16 16.6
22	− 4.2	+ 4.8	. .	+ 0.6
23	− 4.2	− 4.8	. .	− 9.0

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Oct. 28	1	θ^1 Ceti.	P.	41.2	43.6	45.2	51.4	53.5	55.6	1.7	3.3	5.9	17 53.49	− 0.91	− 2.42	− 2.40	1 17 50.18	+ 0.04
	2	B. A. C. 466 . .	P.	12.8	16.3	18.0	25.6	28.3	30.8	38.6	40.4	43.8	27 28.29	− 1.45	. .	− 2.40	1 27 24.44	− 4.05
	3	Weisse 791^1 . .	P.	18.3	21.0	22.5	. .	. .	. .	39.2	40.7	43.3	45 30.83	− 0.61	. .	− 2.39	1 45 27.83	− 3.60
	4	Weisse 791^2 . .	P.	. .	. .	26.9	28.8	30.9	33.0	35.1	. .	. .	45 30.94	− 0.61	. .	− 2.39	1 45 27.94	− 3.60
	5	B. A. C. 625^1 . .	P.	29.0	31.7	33.3	. .	. .	. .	49.7	51.2	53.7	55 41.43	− 0.74	. .	− 2.39	1 55 38.30	− 3.61
	6	B. A. C. 625^2 . .	P.	. .	. .	37.6	39.4	41.5	43.8	45.7	. .	. .	55 41.60	− 0.74	. .	− 2.39	1 55 38.47	− 3.61
	7	Neptune . . .	P.	57.0	59.8	1.3	7.5	9.6	11.7	17.9	19.4	22.0	0 9.58	− 0.61	. .	− 2.38	2 0 6.59	. .
	8	B. A. C. 818 . .	P.	14.4	17.8	19.7	27.5	30.1	32.7	40.4	42.4	45.7	33 30.08	− 1.48	. .	− 2.37	2 33 26.23	− 3.86
	9	B. A. C. 832 . .	P.	35.5	39.2	41.2	49.1	51.7	54.4	2.4	4.4	7.9	35 51.76	− 1.52	. .	− 2.37	2 35 47.87	− 3.89
	10	B. A. C. 855 . .	P.	58.9	1.7	3.7	10.9	13.5	16.0	23.3	24.9	28.2	39 13.46	− 1.35	. .	− 2.37	2 39 9.74	− 3.76
	11	B. A. C. 871 . .	P.	33.0	36.1	38.1	45.8	48.3	50.9	58.6	0.6	3.9	42 48.37	− 0.05	. .	− 2.37	2 42 45.95	− 4.11
	12	B. A. C. 902 . .	P.	32.4	35.7	37.8	. .	. .	. .	58.8	0.7	3.9	48 48.22	− 1.49	. .	− 2.37	2 48 44.36	− 3.80
	13	B. A. C. 930 . .	P.	32.0	35.5	37.5	45.2	47.8	50.5	58.4	0.4	3.5	52 47.87	− 1.48	. .	− 2.37	2 52 44.02	− 3.78
	14	B. A. C. 953 . .	P.	1.2	4.5	6.5	14.3	16.8	19.4	27.3	29.2	32.5	57 16.86	− 0.04	. .	− 2.36	2 57 14.46	− 4.18
	15	B. A. C. 997 . .	P.	39.0	41.9	43.5	50.6	53.1	55.4	2.4	4.1	7.1	6 53.01	− 1.27	. .	− 2.36	3 6 49.38	− 3.62
	16	Ate	P.	5.7	8.7	10.4	17.0	19.3	21.5	28.5	30.2	33.3	11 19.40	− 0.32	. .	− 2.36	3 11 16.72	. .
	17	B. A. C. 1060 . .	P.	36.3	39.4	41.0	48.4	50.9	53.3	0.6	2.4	5.5	18 50.87	− 1.35	. .	− 2.36	3 18 47.16	− 3.60
	18	B. A. C. 1085 . .	P.	14.5	17.5	19.5	27.0	29.5	32.1	39.5	41.5	44.7	23 29.53	− 1.42	. .	− 2.36	3 23 25.75	− 3.60
	19	Clotho	P.	6.9	9.3	10.9	17.0	19.1	21.2	27.2	28.7	31.4	32 19.08	− 0.79	. .	− 2.35	3 32 15.94	. .
	20	B. A. C. 1145 . .	P.	35.0	38.6	40.8	48.9	51.5	54.2	2.3	4.5	7.8	36 51.51	− 1.54	. .	− 2.35	3 36 47.62	− 3.57
	21	Egeria	P.	35.4	. .	44.3	. .	. .	. .	. .	57.3	59.3	42 48.66	− 0.39	. .	− 2.35	3 42 45.92	. .
	22	B. A. C. 1236 . .	P.	52.6	55.7	57.8	5.6	8.4	11.0	18.8	20.8	24.3	52 8.33	− 1.50	. .	− 2.35	3 52 4.48	− 3.46
	23	B. A. C. 1265 . .	P.	9.6	12.5	14.3	21.1	23.5	25.9	32.9	34.6	37.5	59 23.54	− 0.27	. .	− 2.34	3 59 20.93	− 4.01
	24	B. A. C. 1312 . .	P.	17.8	20.9	23.0	30.7	33.3	35.7	43.5	45.5	48.7	9 33.23	− 1.45	. .	− 2.34	4 9 29.44	− 3.34
	25	B. A. C. 1342 . .	P.	55.1	57.9	59.5	6.0	8.1	10.4	17.0	18.6	21.4	15 8.33	− 0.43	. .	− 2.34	4 15 5.56	− 3.81
	26	α Tauri	P.	38.7	41.4	43.2	49.4	51.4	53.6	0.0	1.6	4.3	28 51.51	− 0.50	− 2.34	− 2.39	4 28 48.62	− 0.07
	27	ι Aurigæ. . . .	P.	43.2	46.3	48.2	55.4	57.9	0.3	7.6	9.4	12.5	48 57.87	− 0.17	− 2.32	− 2.39	4 48 55.31	− 0.11
	28	Lalande 9484 . .	P.	41.9	44.7	46.5	53.4	55.7	58.0	4.9	6.5	9.4	56 55.67	− 0.29	. .	− 2.32	4 56 53.06	− 3.93
	29	ε Ursæ Minoris, S. P.	P.	20.0	50.0	19.5	5.0	. .	35.0	19.0	. .	. .	58 49.54	− 7.88	. .	− 2.39	16 58 39.27	− 0.32
	30	β Orionis. . . .	P.	26.0	28.6	30.0	36.2	38.3	40.3	46.6	48.2	50.7	8 38.32	− 0.90	− 2.34	− 2.39	5 8 35.03	− 0.05
	31	β Leonis	Sk.	32.7	35.3	36.9	43.2	45.2	47.3	53.8	55.4	58.0	42 45.31	− 0.52	− 2.32	− 2.33	11 42 42.46	− 0.03
	32	γ Ursæ Majoris. .	Sk.	57.3	1.3	4.2	14.7	18.4	21.9	25.5	. .	39.5	47 18.32	+ 0.48	. .	− 2.33	11 47 16.47	0.00
	33	12 Canum Venat. .	Sk.	58.4	1.6	3.8	11.6	14.3	16.9	24.8	26.7	30.0	50 14.23	− 0.05	− 2.36	− 2.34	12 50 11.84	+ 0.02
	34	Polaris, S. P. . .	Sk.	. .	. .	49.5	24.5	59.0	27.0	36.0	33.0	41.5	14 23.29	−40.00	. .	− 2.34	1 13 40.95	− 1.63
	35	Polaris, S. P. . .	E.	3.0	15.0	12.0	18.0	. .	. .	. .	. .	. .	14 23.86	−40.00	. .	− 2.57	1 13 41.29	− 1.29
29	36	Sun I, N. . . .	Sk.	59.6	2.2	3.8	10.0	12.1	14.2	20.6	22.4	24.9	13 12.20	− 0.96	. .	− 2.35	14 13 8.89	. .
	37	Sun II, S. . . .	Sk.	12.6	15.2	16.7	23.2	25.2	27.2	33.5	35.0	37.7	15 25.14	− 0.96	. .	− 2.35	14 15 21.83	. .
	38	B. A. C. 7795 . .	Sk.	6.0	10.1	14.1	16.1	18.1	20.2	22.2	26.3	30.3	15 18.16	− 0.79	. .	− 2.40	22 15 14.97	− 2.93
	39	η Aquarii . . .	Sk.	50.0	52.5	54.0	0.1	2.2	4.2	10.3	11.9	14.4	29 2.18	− 0.77	− 2.47	− 2.37	22 28 59.04	+ 0.13
	40	ζ Pegasi	Sk.	7.1	9.7	11.3	17.3	19.4	21.6	27.7	29.2	31.8	35 19.46	− 0.60	− 2.32	− 2.37	22 35 16.49	+ 0.01
	41	ι Cephei	Sk.	47.6	53.5	57.4	12.1	17.0	22.0	36.9	40.3	46.7	45 17.06	+ 1.21	. .	− 2.37	22 45 15.92	− 0.09
	42	α Piscis Australis .	Sk.	37.6	40.7	42.5	47.1	49.4	51.7	54.3	56.6	. .	50 51.85	− 1.22	− 2.50	− 2.37	22 50 48.26	+ 0.17
	43	B. A. C. 7998 . .	Sk.	. .	39.9	42.4	45.0	47.5	49.9	55.0	57.0	0.0	51 44.83	− 1.36	. .	− 2.39	22 51 41.08	− 3.89
	44	α Pegasi	Sk.	. .	. .	35.8	38.0	40.1	42.1	46.4	47.9	50.5	58 37.92	− 0.53	− 2.36	− 2.37	22 58 35.02	+ 0.02
	45	Lalande 45562 .	Sk.	23.7	26.4	27.9	34.0	36.0	38.1	44.3	45.8	48.4	10 36.07	− 0.87	. .	− 2.38	23 10 32.82	− 3.27
	46	ο Cephei	Sk.	1.5	8.1	12.1	27.9	33.2	38.7	54.6	58.7	5.4	13 33.36	+ 1.40	. .	− 2.37	23 13 32.39	− 0.22
	47	λ Draconis, S. P. .	Sk.	31.3	23.7	19.3	11.4	5.6	59.5	41.5	37.5	29.5	24 5.48	− 3.37	. .	− 2.37	11 23 59.74	+ 0.28
	48	Weisse 839 . .	Sk.	57.3	0.0	1.4	7.4	9.5	11.6	17.7	19.2	21.7	42 9.53	− 0.84	. .	− 2.37	23 42 6.32	− 3.35
	49	Groombridge 4163	Sk.	6.0	15.2	20.1	42.4	49.5	56.8	18.6	23.8	33.2	48 49.51	+ 2.34	. .	− 2.37	23 48 49.48	− 0.38

16, 17, 19, 21. Wire A used.
29. Bisections at wire II and midway between II and III.
32, 41, 46, 47, 49. Bisections at set C.
34. Bisections at set D.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° '	r. "	"	"	"							"	° ' "	°	' "	° ' "	"
1	47 38	10 2.5	0.2	9.6	4.1	34	090	110	. .	150	165	30.4	47 41 57.9	54.0	+ 1 3.4	98 49 22.5	+ 2.5
2	76 16	5.0	29.4	8.5	4.8	34	215	190	. .	. .	. .	30.4	76 19 55.8	. .	+ 3 52.9	127 30 9.9	+19.6
3	28 38	4.2	1.2	10.5	5.7	36	. .	910	. .	. .	. .	30.4	28 41 13.9	. .	+ 31.6	79 48 6.7	+25.0
4	28 38	4.2	1.2	10.5	5.7	37	. .	. .	. .	195	. .	30.4	28 41 10.0	. .	+ 31.6	79 48 2.8	+25.0
5	36 38	1.0	27.3	7.5	2.6	30	395	. .	. .	. .	470	30.4	36 42 56.6	. .	+ 43.0	87 50 0.8	+24.6
6	36 38	1.0	27.3	7.5	2.6	30	. .	190	. .	240	. .	30.4	36 42 59.9	. .	+ 43.0	87 50 4.1	+24.6
7	28 30	0.6	28.3	8.4	3.3	32	240	260	. .	285	305	30.4	28 34 28.0	53.9	+ 31.4	79 41 20.6	. .
8	77 16	5.0	0.9	9.1	5.9	30	435	440	. .	. .	. .	30.4	77 20 52.6	53.8	+ 4 11.3	128 31 25.1	+23.0
9	79 8	5.0	1.1	8.8	4.4	34	. .	330	. .	320	. .	30.4	79 11 54.0	. .	+ 4 53.4	130 23 8.6	+23.0
10	71 50	3.6	28.5	7.6	3.9	35	. .	610	. .	645	. .	30.4	71 53 35.5	. .	+ 2 54.6	123 2 51.3	+23.6
11	1 2	3.7	2.3	11.7	6.2	37	. .	290	. .	300	. .	30.4	1 5 7.9	. .	+ 1.1	52 11 30.2	+22.2
12	77 42	5.1	1.0	8.2	5.6	34	235	255	. .	. .	. .	30.4	77 45 54.6	. .	+ 4 20.0	128 56 35.8	+23.6
13	77 26	3.0	28.1	6.8	3.9	31	. .	440	. .	380	. .	30.4	77 30 40.5	. .	+ 4 15.1	128 41 16.8	+23.8
14	0 28	3.6	1.4	11.6	5.8	33	750	772	. .	. .	. .	30.4	0 32 2.2	. .	+ 0.5	51 38 23.9	+21.2
15	68 16	3.4	29.6	9.6	4.3	35	130	150	. .	. .	. .	30.4	68 19 41.8	. .	+ 2 24.6	119 28 27.6	+24.5
16	12 38	2.3	0.0	10.5	4.0	39	. .	585	. .	610	. .	30.4	12 43 7.2	. .	+ 13.1	63 49 41.5	− 1.3
17	71 54	3.0	29.4	9.7	4.3	38	335	345	. .	. .	. .	30.4	71 59 25.8	. .	+ 2 56.4	123 8 43.4	+24.6
18	75 4	1.3	27.5	6.2	2.7	38	295	360	. .	. .	. .	30.4	75 6 55.2	. .	+ 3 34.6	126 16 51.0	+24.7
19	40 16	2.5	29.5	9.5	4.1	36	. .	165	. .	250	. .	30.4	40 21 59.2	. .	+ 49.3	91 29 9.7	− 5.4
20	79 54	2.6	28.0	6.3	2.7	33	425	445	. .	. .	. .	30.4	79 58 9.5	. .	+ 5 16.8	131 9 47.5	+25.0
21	16 0	2.0	1.1	9.7	4.2	36	. .	025	. .	030	. .	30.4	16 6 1.8	. .	+ 16.8	67 12 39.8	− 1.6
22	78 4	4.8	29.3	8.6	5.5	32	. .	910	. .	960	. .	30.4	78 8 15.5	. .	+ 4 29.9	129 19 6.6	+25.3
23	10 10	1.5	29.2	9.1	4.0	36	. .	060	. .	075	. .	30.4	10 13 29.1	50.2	+ 10.5	61 20 0.8	+18.0
24	76 6	4.5	29.7	8.5	5.2	33	180	210	. .	. .	. .	30.4	76 10 11.2	. .	+ 3 52.0	127 20 24.4	+25.4
25	18 18	1.8	0.2	10.0	3.7	35	575	540	. .	. .	. .	30.4	18 21 36.2	. .	+ 19.3	69 28 16.7	+18.3
26	22 34	3.1	1.0	10.1	4.8	35	535	565	. .	620	625	30.4	22 37 35.2	. .	+ 24.3	73 44 20.7	+ 1.7
27	5 52	2.8	0.8	10.0	4.0	36	435	405	. .	435	440	30.4	5 55 22.8	. .	+ 6.1	57 1 50.1	+ 1.2
28	11 18	5.0	1.8	11.4	5.8	33	530	560	. .	. .	. .	30.4	11 22 5.0	. .	+ 11.7	62 28 37.9	+13.6
29	301 6	4.4	1.7	9.6	7.2	35	130	215	. .	. .	. .	30.4	301 9 38.3	. .	− 1 36.3	352 14 23.2	+ 1.0
30	47 10	1.9	27.9	7.9	3.8	37	520	510	. .	540	560	30.4	47 13 7.0	48.0	+ 1 3.1	98 20 31.3	+ 0.5
31	23 32	3.4	2.7	13.4	6.5	29	115	169	. .	. .	. .	29.5	23 37 10.8	. .	+ 25.3	74 43 57.3	+ 1.5
32	344 26	4.3	4.0	12.5	6.4	30	250	. .	. .	. .	266	29.5	344 30 53.6	54.2	− 16.0	35 36 58.8	+ 0.5
33	359 50	2.7	3.5	12.5	6.3	32	. .	552	. .	619	. .	29.5	359 54 18.8	. .	− 0.1	51 0 39.9	+ 1.2
34	307 30	4.3	4.4	12.0	8.8	34	. .	. .	. .	270	150	29.5	307 33 50.2	. .	− 1 14.0	358 38 57.4	− 0.5
35	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
36	52 2	9 29.0	25.0	6.7	29.8	34	528	708	. .	. .	. .	29.5	52 5 53.5	. .	+ 1 12.4	103 13 27.1	. .
37	52 34	26.2	22.5	4.7	27.8	33	. .	. .	. .	836	884	29.5	52 38 7.3	64.3	+ 1 14.0	103 45 42.5	. .
38	40 50	10 5.5	1.0	11.1	4.4	35	. .	470	. .	530	. .	29.0	40 53 34.2	61.4	+ 49.1	92 0 44.5	+15.6
39	39 34	3.0	29.0	8.6	2.5	32	960	940	. .	. .	. .	29.0	39 38 15.2	. .	+ 47.0	90 45 23.4	+ 0.6
40	28 38	5.6	1.5	11.7	5.4	33	. .	594	. .	608	. .	29.0	28 42 2.8	. .	+ 31.1	79 48 55.1	+ 2.5
41	333 18	4.6	1.0	10.2	5.5	37	530	. .	. .	. .	550	29.0	333 21 3.2	. .	− 28.5	24 26 55.9	+ 0.2
42	69 4	3.0	29.4	8.0	2.8	33	550	588	. .	. .	. .	29.0	69 8 5.4	. .	+ 2 28.0	120 16 54.6	+ 1.6
43	74 58	5.0	29.7	8.7	4.5	36	. .	. .	. .	612	590	29.0	75 1 18.3	. .	+ 3 29.0	126 11 8.5	+ 7.7
44	24 18	8.8	5.9	15.4	8.5	37	. .	. .	. .	980	010	29.0	24 20 52.3	. .	+ 25.7	75 27 39.2	+ 2.1
45	46 40	5.0	0.1	10.3	4.5	37	608	638	. .	. .	. .	29.0	46 43 1.8	. .	+ 1 0.4	97 50 23.4	+17.4
46	331 24	4.6	2.0	10.3	5.0	33	738	. .	. .	. .	740	29.0	331 28 1.2	. .	− 31.0	22 33 51.4	− 0.5
47	288 54	6.5	3.0	10.4	5.4	36	810	. .	. .	. .	910	29.0	288 57 12.6	. .	− 2 44.3	340 0 49.5	+ 1.4
48	44 12	4.5	1.0	9.5	5.0	37	. .	522	. .	524	. .	29.0	44 15 3.7	. .	+ 55.5	95 22 20.4	+19.8
49	325 8	2.5	1.5	9.5	5.0	37	944	. .	. .	. .	900	29.0	325 10 58.0	. .	− 39.7	16 16 39.5	+ 0.7

No.	Barom.	At. Ther.
	in.	°
1	29.97	55.4
7	29.96	55.4
8	29.95	55.2
23	29.96	52.6
30	29.96	51.1
32	29.98	54.2
37	29.97	63.0
38	29.91	62.8

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	"	' "	' "	' "
7	− 0.1	. .	. .	− 0.1
36	− 7.1	+ 16 7.7	. .	+ 16 0.6
37	− 7.1	− 16 7.7	. .	− 16 14.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Oct. 29	1	B. A. C. 8332	Sk.	55.8	58.6	0.5	7.5	9.8	12.1	19.2	21.0	24.0	52 9.83	− 1.24	. .	− 2.37	23 52 6.22	− 3.85
	2	B. A. C. 8343	Sk.	8.2	11.5	13.6	21.6	24.1	27.0	35.1	37.1	40.5	55 24.30	− 1.46	. .	− 2.36	23 55 20.48	− 4.20
	3	Lamont 18	Sk.	10.1	12.5	14.2	20.3	22.4	24.4	30.5	32.0	34.6	6 22.33	− 0.70	. .	− 2.36	0 6 19.17	− 3.39
	4	κ Draconis, S. P.	Sk.	51.0	43.4	39.0	20.4	14.7	8.4	49.8	45.8	37.6	28 14.46	− 3.44	. .	− 2.37	12 28 8.55	− 0.16
	5	Weisse 753	Sk.	30.7	33.2	34.7	40.9	42.9	45.0	51.0	52.6	55.1	44 42.90	− 0.72	. .	− 2.35	0 44 39.83	− 3.47
	6	Polaris	Sk.	25.5	13.5	19.0	9.5	39.0	. .	. .	. .	. .	18 5.24	+38.17	. .	− 2.37	1 13 41.04	− 1.51
	7	θ¹ Ceti	Sk.	41.0	43.6	45.2	51.4	53.4	55.5	1.7	3.2	5.8	17 53.42	− 0.89	− 2.37	− 2.37	1 17 50.16	+ 0.02
	8	β Arietis	Sk.	37.7	40.3	42.0	48.4	. .	52.8	59.5	1.0	3.6	47 50.66	− 0.43	− 2.31	− 2.38	1 47 47.85	− 0.05
	9	B. A. C. 625, n. p.*	Sk.	29.2	31.7	33.4	. .	. .	. .	49.5	51.1	53.7	55 41.43	− 0.73	. .	− 2.32	1 55 38.38	− 3.62
	10	B. A. C. 625, s. f.*	Sk.	. .	. .	37.5	39.6	41.6	43.7	45.6	. .	. .	55 41.60	− 0.73	. .	− 2.32	1 55 38.55	− 3.62
	11	B. A. C. 818	Sk.	14.6	17.7	19.7	27.6	30.3	32.8	40.7	42.6	45.9	33 30.21	− 1.41	. .	− 2.30	2 33 26.50	− 3.87
	12	B. A. C. 840	Sk.	0.0	3.4	5.5	13.1	15.7	18.4	26.2	28.3	31.6	37 15.80	− 1.41	. .	− 2.30	2 37 12.09	− 3.87
	13	B. A. C. 878¹	Sk.	30.6	32.8	35.8	43.7	46.3	49.9	56.5	58.5	1.9	43 46.22	− 1.40	. .	− 2.30	2 43 42.52	− 3.82
	14	B. A. C. 902	Sk.	32.6	35.8	37.8	45.6	48.2	51.1	59.0	0.8	3.8	48 48.30	− 1.42	. .	− 2.30	2 48 44.58	− 3.82
	15	Ianthe	Sk.	32.8	36.0	. .	. .	. .	. .	58.9	0.7	3.6	4 48.33	− 0.08	. .	− 2.30	3 4 45.95	. .
	16	Ate	Sk.	11.3	14.1	15.8	22.7	24.9	27.1	34.1	35.7	38.4	10 24.90	− 0.34	. .	− 2.29	3 10 22.27	. .
	17	B. A. C. 1060	Sk.	36.0	39.2	41.1	48.4	50.8	53.4	0.7	2.4	5.5	18 50.83	− 1.30	. .	− 2.29	3 18 47.24	− 3.61
	18	Clotho	Sk.	32.2	34.7	36.5	40.4	44.4	48.6	52.8	54.3	56.9	31 44.53	− 0.78	. .	− 2.28	3 31 41.47	. .
	19	ζ Persei	Sk.	9.0	11.9	13.7	20.8	23.2	25.5	32.9	34.5	37.6	46 23.23	− 0.23	− 2.26	− 2.38	3 46 20.62	− 0.13
	20	γ¹ Eridani	Sk.	6.1	8.7	10.3	16.5	18.5	20.7	27.2	28.5	31.2	52 18.63	− 0.96	− 2.30	− 2.38	3 52 15.29	− 0.04
31	21	γ Ursæ Majoris	P.	57.8	2.2	4.9	15.3	18.8	22.3	32.8	35.4	40.0	47 18.83	+ 0.57	. .	− 2.78	11 47 16.62	+ 0.06
	22	o Virginis	P.	43.0	45.6	47.1	53.3	55.4	57.5	3.6	5.2	7.8	58 55.39	− 0.64	− 2.78	− 2.78	11 58 51.97	− 0.02
	23	B. A. C. 4124	P.	14.8	17.7	19.3	25.7	27.8	30.0	36.2	37.9	40.4	9 27.76	− 1.09	. .	− 2.78	12 9 23.89	− 1.14
	24	B. A. C. 4211	P.	. .	. .	. .	. .	. .	. .	37.3	38.8	41.7	23 28.83	− 1.07	. .	− 2.78	12 23 24.98	− 1.12
	25	B. A. C. 4340	P.	13.5	15.0	19.3	23.3	25.3	27.4	31.4	32.9	35.4	49 23.24	− 0.73	. .	− 2.79	12 49 19.72	− 1.25
	26	12 Canum Venat.	P.	. .	. .	. .	14.6	17.4	19.9	25.2	27.2	30.4	50 14.67	− 0.01	− 2.79	− 2.79	12 50 11.87	0.00
	27	B. A. C. 4367	P.	49.5	52.0	53.5	59.7	1.9	4.0	10.2	11.7	14.4	56 1.88	− 0.60	. .	− 2.79	12 55 58.49	− 1.26
	28	Polaris, S. P.	P.	. .	. .	. .	. .	. .	. .	. .	. .	47.0	14 27.83	−42.82	. .	− 2.79	1 13 42.22	− 0.14
	29	η Ursæ Majoris	P.	24.6	27.3	33.4	36.7	39.9	43.1	46.3	52.5	54.9	42 39.86	+ 0.36	. .	− 2.79	13 42 37.43	+ 0.04
Nov. 1	30	γ Ursæ Majoris	P.	58.0	2.5	5.0	15.5	19.0	22.6	33.0	35.6	40.1	47 19.03	+ 0.50	. .	− 2.86	11 47 16.67	+ 0.07
	31	o Virginis	P.	43.3	45.8	47.3	53.5	55.6	57.7	3.8	5.4	8.0	58 55.60	− 0.70	− 2.91	− 2.86	11 58 52.04	− 0.03
	32	B. A. C. 4124	P.	15.2	17.8	19.5	25.8	28.0	30.4	36.5	38.2	40.8	9 28.02	− 1.15	. .	− 2.99	12 9 23.88	− 1.16
	33	η Virginis	P.	23.5	26.0	27.7	33.8	35.9	38.0	44.0	45.5	48.0	13 35.82	− 0.86	− 2.94	− 2.87	12 13 32.09	+ 0.05
	34	B. A. C. 4211	P.	16.4	19.0	20.7	27.0	29.1	31.3	37.5	39.2	41.8	23 29.11	− 1.13	. .	− 2.98	12 23 25.00	− 1.14
	35	β Corvi	P.	41.3	44.2	45.9	52.4	54.8	57.0	3.5	5.3	8.0	27 54.71	− 1.26	− 3.04	− 2.87	12 27 50.58	+ 0.13
	36	B. A. C. 4340	P.	11.3	13.7	15.3	19.4	21.4	23.5	25.5	27.6	. .	49 23.49	− 0.70	. .	− 2.97	12 49 19.73	− 1.27
	37	12 Canum Venat.	P.	59.2	2.5	4.5	12.4	14.8	17.4	25.5	27.3	30.6	50 14.91	− 0.07	− 2.95	− 2.87	12 50 11.97	+ 0.08
	38	B. A. C. 4367	P.	49.6	52.3	53.8	0.0	2.1	4.3	10.4	12.0	14.6	56 2.12	− 0.66	. .	− 2.96	12 55 58.50	− 1.28
	39	Polaris, S. P.	P.	3.0	19.0	54.0	26.0	1.0	30.0	40.0	34.0	47.0	14 25.83	−42.5	. .	− 2.88	1 13 40.43	− 1.78
	40	α Virginis	P.	29.3	31.9	33.4	39.6	41.7	43.8	50.0	51.6	54.2	18 41.72	− 1.0	− 2.99	− 2.88	13 18 37.80	+ 0.09
	41	ζ Virginis	P.	12.0	14.7	16.3	22.4	24.4	26.5	32.5	34.1	36.7	28 24.40	− 0.86	− 2.91	− 2.88	13 28 20.66	+ 0.03
	42	η Ursæ Majoris	P.	20.9	24.8	27.3	36.7	39.9	43.0	52.5	55.0	58.9	42 39.89	+ 0.20	. .	− 2.88	13 42 37.30	− 0.11
	43	η Bootis	P.	35.6	38.2	39.9	46.3	48.5	50.6	57.2	58.7	1.5	48 48.50	− 0.53	− 2.93	− 2.88	13 48 45.09	0.00
2	44	Sun I, N.	P.	37.7	40.5	42.0	48.3	50.4	52.5	58.8	0.4	3.0	28 50.40	− 1.11	. .	− 2.92	14 28 46.37	. .
	45	Sun II, S.	P.	51.5	54.3	55.9	2.2	4.3	6.4	12.8	14.3	17.0	31 4.30	− 1.11	. .	− 2.92	14 31 0.27	. .
	46	ε Bootis	P.	21.9	24.8	26.4	33.4	35.7	38.0	44.8	46.5	49.4	39 35.66	− 0.35	− 2.81	− 2.89	14 39 32.42	− 0.10
	47	β Libræ	P.	9.8	12.3	13.8	18.0	20.1	22.2	24.3	26.3	. .	10 22.16	− 1.01	− 3.10	− 2.89	15 10 18.26	+ 0.21
	48	Venus I, N.	P.	48.0	50.7	52.4	58.7	0.9	3.0	9.5	11.0	13.8	12 0.89	− 1.16	. .	− 2.90	15 11 56.83	+ 0.36
	49	Venus S.	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . . .	. .

4. Bisections at set C.
6. Bisections assumed to be on set B.
15, 16, 18. Wire A used.
30. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	68 58	10 6.0	1.8	11.0	5.8	34	504	556	. .	. .	. .	29.0	69 1 47.8	. .	+ 2 27.7	120 10 36.7	+14.3
2	79 36	6.0	3.0	10.0	5.2	37	. .	482	. .	404	. .	29.0	79 39 3.6	. .	+ 5 2.0	130 50 26.8	+11.9
3	40 44	5.2	2.2	12.2	4.5	34	. .	494	. .	506	. .	29.0	40 47 49.0	. .	+ 49.2	91 54 59.4	+21.7
4	289 20	6.3	4.3	12.0	7.5	31	390	. .	. .	. .	460	29.0	289 24 34.6	. .	− 2 40.6	340 28 15.2	+ 1.5
5	36 2	3.5	0.0	9.8	3.0	37	. .	368	. .	480	. .	29.0	36 5 6.2	. .	+ 41.7	87 12 9.1	+23.8
6	310 12	7.8	5.4	12.5	7.6	34	660	530	. .	. .	. .	29.0	310 15 47.6	56.2	− 1 7.5	1 21 1.3	− 0.6
7	47 38	5.9	3.4	11.0	6.0	33	. .	880	. .	. .	. .	29.0	47 41 57.5	. .	+ 1 2.9	98 49 21.6	+ 1.5
8	18 38	4.9	3.8	13.5	5.5	37	. .	030	. .	100	. .	29.0	18 41 9.0	. .	+ 19.4	69 47 49.6	+ 2.0
9	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
10	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
11	77 16	3.5	0.5	8.9	3.2	30	. .	500	. .	560	. .	29.0	77 20 51.5	. .	+ 4 10.3	128 31 23.0	+22.8
12	77 40	7.4	2.9	9.5	6.1	33	. .	538	. .	632	. .	29.0	77 44 2.3	. .	+ 4 18.1	128 54 41.6	+22.9
13	76 40	5.3	0.9	8.5	4.0	31	. .	. .	. .	290	348	29.0	76 44 39.0	. .	+ 3 59.2	127 54 59.4	+23.2
14	77 42	5.9	1.9	8.5	5.5	34	. .	628	. .	520	. .	29.0	77 45 48.2	. .	+ 4 19.0	128 56 28.4	+23.4
15	1 6	5.1	4.0	12.7	5.8	37	. .	. .	. .	742	830	29.0	1 11 31.4	. .	+ 1.2	52 17 53.8	− 0.1
16	12 40	6.7	4.0	14.7	5.4	37	. .	076	. .	208	. .	29.0	12 45 39.9	. .	+ 13.0	63 52 14.1	− 1.3
17	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
18	40 26	5.4	2.2	11.9	5.0	37	. .	160	. .	100	. .	29.0	40 31 41.5	. .	+ 49.3	91 38 52.0	− 5.3
19	7 18	7.0	6.5	15.5	7.5	31	. .	380	. .	410	. .	29.0	7 22 33.7	. .	+ 7.5	58 29 2.4	− 0.2
20	52 40	4.5	0.5	9.5	3.6	34	. .	130	. .	235	. .	29.0	52 43 55.3	51.8	+ 1 15.7	103 51 32.2	+ 1.3
21	344 26	9 29.0	27.4	8.2	4.0	30	. .	590	. .	620	. .	30.8	344 30 54.7	41.2	− 16.4	35 36 59.5	+ 0.2
22	29 24	28.0	25.8	7.9	3.2	35	. .	595	. .	640	. .	30.8	29 27 38.5	. .	+ 33.5	80 34 33.2	+ 1.2
23	55 40	28.6	24.6	8.0	2.9	37	. .	580	. .	550	. .	30.8	55 43 8.7	. .	+ 1 26.6	106 50 56.5	− 6.2
24	54 38	10 0.4	26.6	8.9	3.3	35	. .	940	. .	950	. .	30.8	54 41 32.3	43.4	+ 1 23.2	105 49 16.7	− 7.1
25	34 44	9 26.5	23.0	5.9	1.3	32	. .	425	. .	410	. .	30.8	34 48 29.5	. .	+ 41.0	85 55 31.7	−11.4
26	359 50	10 1.0	29.5	11.5	5.8	32	. .	. .	. .	765	800	30.8	359 54 19.4	. .	− 0.1	51 0 40.5	+ 0.9
27	27 12	9 27.9	24.9	7.8	2.7	36	. .	360	. .	330	. .	30.8	27 15 27.8	44.7	+ 30.4	78 22 19.4	−12.8
28	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
29	348 54	10 0.5	28.4	9.9	5.2	34	. .	. .	. .	585	635	30.8	348 57 52.6	. .	− 11.4	40 4 2.4	+ 0.5
30	344 26	9 28.7	26.0	7.7	3.0	30	. .	615	. .	635	. .	31.1	344 30 55.2	40.1	− 16.5	35 36 59.9	+ 1.3
31	29 24	27.4	24.4	7.4	1.5	35	. .	735	. .	660	. .	31.1	29 27 38.6	. .	+ 33.6	80 34 33.4	+ 1.2
32	55 40	28.2	24.2	7.9	2.1	37	. .	470	. .	485	. .	31.1	55 43 10.8	. .	+ 1 27.0	106 50 59.0	− 6.2
33	38 48	10 2.9	28.4	10.5	5.5	36	. .	610	. .	615	. .	31.1	38 51 20.4	40.7	+ 47.9	89 58 29.5	+ 1.3
34	54 38	2.0	28.0	10.7	4.3	35	. .	825	. .	870	. .	31.1	54 41 32.6	. .	+ 1 23.7	105 49 17.5	− 7.2
35	61 30	1.7	27.4	10.3	5.2	33	. .	. .	. .	110	160	31.1	61 34 14.5	. .	+ 1 49.2	112 42 24.9	+ 1.4
36	34 44	9 29.2	26.1	9.1	3.6	32	090	130	. .	. .	. .	31.1	34 48 31.4	. .	+ 41.2	85 55 33.8	−11.6
37	359 50	29.0	28.0	10.5	3.1	32	. .	. .	. .	865	860	31.1	359 54 20.3	. .	− 0.1	51 0 41.4	+ 1.4
38	27 12	10 1.0	27.9	10.3	4.7	36	085	105	. .	145	165	31.1	27 15 28.9	42.4	+ 30.5	78 22 20.6	−13.0
39	307 30	9 28.4	27.0	8.5	5.0	34	465	470	520	480	465	31.1	307 33 55.0	. .	− 1 16.8	358 38 59.4	0.0
40	49 18	10 0.8	28.0	10.4	4.6	29	. .	. .	. .	540	565	31.1	49 23 9.7	43.0	+ 1 8.9	100 30 39.8	+ 1.1
41	38 46	2.6	29.1	12.0	5.6	32	. .	. .	. .	350	345	31.1	38 50 25.6	. .	+ 47.6	89 57 34.4	+ 2.2
42	348 54	9 29.5	26.5	8.0	3.2	34	620	610	. .	595	630	31.1	348 57 54.2	. .	− 11.5	40 4 3.9	+ 1.7
43	19 48	10 1.6	29.0	12.0	5.9	33	. .	790	. .	775	. .	31.1	19 52 3.6	43.5	+ 21.4	70 58 46.2	+ 3.7
44	53 20	0.4	27.1	10.0	4.0	35	515	600	. .	. .	. .	31.1	53 23 38.0	. .	+ 1 19.2	104 31 18.4	. .
45	53 52	9 25.5	23.0	4.0	29.7	34	. .	. .	. .	730	740	31.1	53 55 55.2	44.4	+ 1 20.8	105 3 37.2	. .
46	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
47	47 44	29.5	25.4	7.7	1.0	34	150	160	. .	. .	. .	28.1	47 47 58.1	. .	+ 1 4.8	98 55 24.1	+ 1.2
48	56 24	25.9	21.9	5.5	29.6	37	485	. .	. .	. .	460	28.1	56 27 10.2	. .	+ 1 28.5	107 34 59.9	. .
49	56 24	25.9	21.9	5.5	29.6	36	. .	865	. .	790	. .	28.1	56 27 20.2	45.3	+ 1 28.5	107 55 9.9	. .

No.	Barom.	At. Ther.
	in.	°
6	29.87	59.6
20	29.83	54.2
21	30.00	41.6
24	30.00	44.0
27	30.00	45.5
30	30.02	41.2
33	30.02	42.1
38	30.02	43.2
40	30.02	43.8
43	30.01	44.5
45	30.00	45.4
49	30.00	45.6

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
44	− 7.2	+ 16 9.4	. .	+ 16 2.2
45	− 7.2	− 16 9.4	. .	− 16 16.6
48	− 4.4	+ 5.0	. .	+ 0.6
49	− 4.4	− 5.0	0.0	− 9.4

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s .
Nov. 2	1	α Coronæ Borealis .	P.	13.9	16.8	18.5	25.4	27.7	30.0	36.9	38.5	41.4	29 27.68	− 0.36	− 2.84	− 2.90	15 29 24.42	− 0.06
	2	α Serpentis . . .	P.	59.0	1.7	3.2	9.4	11.3	13.4	19.7	21.3	23.7	38 11.41	− 0.74	− 2.92	− 2.90	15 38 7.77	+ 0.04
	3	B. A. C. 5216 . .	P.	16.9	19.5	21.1	27.3	29.6	31.7	38.0	39.6	42.4	40 29.57	− 0.58	. .	− 2.88	15 40 26.11	− 0.92
	4	ε Serpentis . . .	P.	27.7	30.2	31.7	37.8	40.0	42.1	48.1	49.6	52.2	44 39.93	− 0.78	− 2.89	− 2.90	15 44 36.25	− 0.01
	5	B. A. C. 5284 . .	P.	32.5	35.2	36.8	43.3	45.3	47.4	53.7	55.3	57.9	50 45.26	− 0.58	. .	− 2.87	15 50 41.81	− 0.92
	6	δ Scorpii	P.	48.9	51.8	53.4	59.9	2.2	4.4	10.8	12.5	15.3	53 2.13	− 1.25	− 2.95	− 2.90	15 52 57.98	+ 0.06
	7	β¹ Scorpii	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	8	α Ophiuchi . . .	P.	0.2	2.9	4.3	10.6	12.7	14.8	21.1	22.6	25.3	29 12.72	− 0.64	− 2.99	− 2.92	17 29 9.16	+ 0.10
	9	B. A. C. 5996 . .	P.	10.7	13.2	14.7	20.8	23.0	25.1	31.2	32.6	35.3	37 22.96	− 0.78	. .	− 2.82	17 37 19.36	− 1.33
	10	μ Herculis . . .	P.	24.2	27.1	28.9	35.7	38.1	40.3	47.3	49.0	51.9	41 38.06	− 0.35	− 2.94	− 2.92	17 41 34.79	+ 0.02
	11	B. A. C. 6082 . .	P.	46.2	49.3	51.2	58.8	1.4	4.0	11.8	13.6	16.8	52 1.46	− 0.12	. .	− 2.81	17 51 58.53	− 0.46
	12	γ Draconis . . .	P.	28.6	31.3	37.8	41.2	44.3	47.6	50.9	57.4	0.0	53 44.34	+ 0.36	. .	− 2.92	17 53 41.78	− 0.24
	13	Moon I. . . .	P.	6.8	9.7	11.6	18.7	21.2	23.6	30.8	32.5	35.5	1 21.16	− 1.40	. .	− 2.81	18 1 16.95	+69.88
	14	η Serpentis . . .	P.	43.7	46.3	47.8	54.0	56.0	58.0	4.2	5.7	8.3	14 56.00	− 0.91	− 3.00	− 2.92	18 14 52.17	+ 0.14
	15	61¹ Cygni	P.	6.8	10.2	12.0	20.0	22.4	25.1	32.8	34.8	38.1	1 22.47	− 0.07	− 2.87	− 2.95	21 1 19.45	− 0.12
	16	Transit Zones 176, 4	P.	47.2	50.0	51.6	56.1	58.4	0.5	2.8	5.0	. .	8 0.52	− 1.25	. .	− 2.97	21 7 56.30	− 2.96
	17	O. Arg. S. 21249 .	P.	. .	46.6	48.6	50.9	53.1	55.3	59.7	1.2	4.2	8 50.90	− 1.24	. .	− 2.97	21 8 46.67	− 2.95
	18	1 Pegasi	P.	11.0	13.8	15.3	21.8	24.0	26.2	32.6	34.2	36.9	16 23.98	− 0.50	− 2.99	− 2.95	21 16 20.53	− 0.01
	19	1 Draconis, S. P. .	P.	52.6	34.2	23.8	55.1	40.0	25.7	. .	. .	. .	19 25.80	− 7.80	. .	− 2.95	9 19 15.05	− 0.08
	20	d Ursæ Majoris. .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	21	Saturn I, N. . .	P.	16.6	19.2	20.9	, .	. .	. .	37.9	39.3	42.0	29 29.32	− 1.14	. .	− 2.97	21 29 25.21	. .
	22	Saturn II, S. . .	P.	. .	. .	26.3	28.3	30.4	32.6	34.7	. .	. .	29 30.46	− 1.14	. .	− 2.97	21 29 26.35	. .
	23	ε Pegasi	P.	56.6	59.1	0.6	6.8	8.9	11.0	17.1	18.7	21.3	38 8.90	− 0.69	− 2.91	− 2.95	21 38 5.26	− 0.03
	24	μ Capricorni . .	P.	23.4	25.8	27.4	33.8	35.9	38.0	44.4	45.9	48.5	46 35.90	− 1.09	− 3.02	− 2.96	21 46 31.85	+ 0.09
	25	79 Draconis . . .	P.	36.7	45.8	50.8	11.9	19.2	25.9	46.9	52.3	1.0	51 18.94	+ 2.40	. .	− 2.96	21 51 18.38	− 0.31
	26	α Aquarii. . . .	P.	16.2	18.8	20.3	26.4	28.4	30.5	36.7	38.1	40.7	59 28.46	− 0.86	− 3.01	− 2.96	21 59 24.64	+ 0.08
	27	Mural Zones 207, 63	P.	32.0	34.7	36.3	42.6	44.8	46.9	53.3	54.9	57.5	1 44.78	− 1.15	. .	− 2.96	22 1 40.67	− 3.11
	28	32 Ursæ Majoris, S. P.	P.	35.7	29.2	25.6	10.6	5.6	0.8	45.9	42.2	36.0	9 5.73	− 3.05	. .	− 2.96	10 8 59.72	+ 0.14
	29	B. A. C. 7795 . .	P.	6.4	9.0	10.6	16.7	18.8	20.8	26.9	28.4	30.8	15 18.71	− 0.88	. .	− 2.96	22 15 14.87	− 2.88
	30	π Aquarii. . . .	P.	48.0	50.5	52.1	58.2	0.2	2.2	8.5	9.8	12.4	19 0.21	− 0.83	− 2.93	− 2.96	22 18 56.42	− 0.01
	31	9 Draconis, S. P. .	P.	29.2	17.8	11.4	45.5	36.5	28.3	2.0	56.2	45.1	24 36.89	− 4.92	. .	− 2.96	10 24 29.01	− 0.23
	32	η Aquarii. . . .	P.	50.6	53.2	54.6	0.7	2.8	4.8	11.0	12.5	15.1	29 2.81	− 0.86	− 3.05	− 2.96	22 28 58.99	+ 0.12
	33	226 Cephei	P.	. .	. .	. .	. .	. .	21.0	37.8	43.7	54.0	30 5.16	+ 2.99	. .	− 2.96	22 30 5.19	+ 0.02
	34	B. A. C. 7909 . .	P.	18.7	21.6	23.3	30.4	32.7	35.0	42.2	43.9	46.8	35 32.73	− 1.42	. .	− 2.96	22 35 28.35	− 3.58
	35	α Pegasi	P.	25.9	28.5	30.0	36.3	38.4	40.6	46.9	48.5	51.1	58 38.47	− 0.59	− 2.88	− 2.97	22 58 34.91	− 0.06
	36	B. A. C. 8102 . .	P.	17.0	19.6	21.1	27.3	29.4	31.6	37.7	39.3	41.8	10 29.42	− 0.99	. .	− 2.96	23 10 25.47	− 3.25
	37	θ Piscium . . .	P.	32.3	34.8	36.3	42.4	44.5	46.5	52.8	54.2	56.9	21 44.52	− 0.75	− 3.00	− 2.97	23 21 40.80	+ 0.09
	38	ι Piscium . . .	P.	26.0	28.5	30.0	36.2	38.2	40.3	46.4	48.0	50.5	33 38.23	− 0.76	− 2.96	− 2.97	23 33 34.50	− 0.01
	39	Groombridge 4163	P.	6.3	20.7	35.5	42.6	50.2	57.3	4.4	19.2	33.7	48 49.99	+ 2.54	. .	− 2.97	23 48 49.56	− 0.14
	40	ω Piscium . . .	P.	48.3	50.7	52.3	58.5	0.6	2.6	8.8	10.3	12.8	53 0.54	− 0.74	− 2.94	− 2.98	23 52 56.82	− 0.03
	41	B. A. C. 8348 . .	P.	. .	. .	. .	39.1	41.8	44.4	49.5	51.2	54.7	55 39.12	− 1.61	. .	− 2.96	23 55 34.55	− 4.06
	42	α Andromedæ . .	P.	48.2	51.0	52.9	59.8	2.1	4.4	11.4	13.1	16.0	2 2.10	− 0.31	− 2.89	− 2.98	0 1 58.81	− 0.07
	43	γ Pegasi	P.	42.3	44.8	46.4	52.7	54.8	56.8	3.2	4.8	7.4	6 54.80	− 0.59	− 2.94	− 2.98	0 6 51.23	− 0.04
	44	κ Draconis, S. P. .	P.	52.2	44.4	40.0	21.8	15.4	9.5	50.9	46.4	38.9	28 15.50	− 3.63	. .	− 2.98	12 28 8.89	+ 0.03
	45	B. A. C. 166 . .	P.	31.3	34.2	35.9	43.0	45.3	47.6	54.8	56.5	59.5	32 45.34	− 0.27	. .	− 2.96	0 32 42.11	− 3.35
	46	β Ceti.	P.	13.8	16.4	18.0	24.5	26.6	28.9	35.3	37.0	39.7	37 26.69	− 1.18	− 2.97	− 2.98	0 37 22.53	+ 0.04
	47	32¹ Camelopard., S. P.	P.	48.3	33.3	54.5	. .	14.3	. .	34.2	55.0	39.8	48 14.20	−10.37	. .	− 2.96	12 48 0.87	+ 4.75
	48	32² Camelopard., S. P.	P.	55.8	40.4	1.0	41.5	22.1	2.5	42.4	2.7	48.5	48 21.88	−10.37	. .	− 2.98	12 48 8.53	− 0.47
	49	ε Piscium . . .	P.	22.3	24.8	26.3	32.5	34.6	36.6	42.7	44.4	46.9	56 34.57	− 0.72	− 2.93	− 2.99	0 56 30.86	− 0.04
	50	B. A. C. 303 . .	P.	19.0	21.5	23.3	29.2	31.4	33.5	39.6	41.1	43.6	58 31.36	− 0.76	. .	− 2.95	0 58 27.65	− 3.50

17, 27, 50. Wire A used.
19. Bisections at wires B_1 and C_1.
20, 39. Bisections at wires II and III.
25, 31, 44. Bisections at sets B and D.
28, 33. Bisections at wires V and VI.
47, 48. Bisections at set C.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° '	r. "	"	"	"							"	° ' "	°	' "	° ' "	"
1	11 42	10 1.6	29.2	11.9	5.4	36	245	210	. .	260	300	28.2	11 45 23.1	. .	+ 12.2	62 51 56.5	− 0.6
2	32 0	9 28.9	25.2	7.9	2.0	34	025	160	. .	. .	. .	28.3	32 3 59.3	. .	+ 36.8	83 10 57.3	+ 1.8
3	23 0	10 1.3	28.3	11.3	4.7	31	. .	790	. .	830	. .	28.3	23 4 31.7	. .	+ 25.0	74 11 17.9	− 9.2
4	33 58	0.4	28.1	10.4	5.1	34	615	630	. .	. .	. .	28.3	34 1 48.7	. .	+ 39.6	85 8 49.5	− 0.6
5	22 44	9 27.8	26.2	9.4	2.0	29	. .	505	. .	585	. .	28.4	22 49 9.1	. .	+ 24.7	73 55 55.0	− 8.6
6	61 4	10 0.0	26.2	9.3	4.0	34	. .	. .	. .	290	275	28.4	61 7 55.5	. .	+ 1 45.9	112 16 2.6	+ 1.7
7	58 16	0.5	25.9	9.4	3.0	34	. .	. .	. .	. .	130	28.7	58 19 58.4	47.3	+ 1 34.7	109 27 54.3	+ 1.6
8	26 10	2.2	29.7	11.8	6.6	33	555	565	. .	615	600	28.8	26 14 3.9	47.9	+ 28.8	77 20 53.9	+ 1.9
9	34 12	0.7	27.9	9.8	4.8	34	. .	880	. .	845	. .	28.9	34 15 46.1	. .	+ 39.9	85 22 47.2	− 3.4
10	11 2	9 29.1	27.8	10.2	2.9	34	990	985	. .	. .	. .	28.9	11 5 44.9	. .	+ 11.5	62 12 17.6	+ 2.0
11	1 34	10 4.7	1.5	10.4	3.6	36	015	060	. .	. .	. .	28.9	1 37 26.4	. .	+ 1.7	52 43 49.3	+ 3.7
12	347 20	9 28.9	26.3	8.9	3.5	36	. .	. .	. .	055	065	28.9	347 23 30.2	. .	− 13.1	38 29 38.3	− 1.0
13	68 14	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
14	41 44	29.6	26.0	9.5	2.9	31	600	630	. .	630	670	29.1	41 48 37.0	47.5	+ 52.4	92 55 50.6	+ 2.8
15	0 42	10 1.2	28.9	9.5	3.8	37	. .	. .	. .	530	535	29.8	0 45 6.8	. .	+ 0.8	51 51 28.8	+ 2.3
16	61 8	4.0	0.2	10.5	6.2	35	125	. .	. .	. .	. .	29.8	61 11 40.3	. .	+ 1 47.5	112 19 49.0	+ 3.5
17	60 42	0.3	27.5	8.6	3.6	31	. .	. .	. .	255	. .	29.8	60 49 16.0	42.2	+ 1 45.9	111 57 23.1	+ 3.7
18	19 32	2.7	0.0	11.6	5.9	30	. .	900	. .	875	. .	29.9	19 36 46.2	. .	+ 21.1	70 43 28.5	+ 2.5
19	300 44	9 28.6	25.0	5.6	2.9	36	180	270	. .	. .	. .	29.9	300 47 28.6	. .	− 1 39.3	351 52 10.5	+ 0.8
20	289 14	10 2.0	29.5	10.2	5.9	30	860	865	. .	. .	. .	29.9	289 18 46.4	. .	− 2 47.9	340 22 19.7	+ 2.4
21	55 6	4.4	0.0	10.3	5.9	35	975	. .	. .	. .	990	29.9	55 9 27.9	. .	+ 1 25.2	106 17 14.3	. .
22	55 6	4.4	0.0	10.3	5.9	34	. .	905	. .	910	. .	29.9	55 9 44.5	. .	+ 1 25.2	106 17 30.9	. .
23	29 30	1.0	27.6	9.4	3.3	31	. .	470	. .	480	. .	30.0	29 34 39.6	. .	+ 33.7	80 41 34.5	+ 2.1
24	52 56	1.8	28.3	9.9	3.9	31	905	935	. .	. .	. .	30.0	53 0 31.6	. .	+ 1 18.7	104 8 11.5	− 1.7
25	325 44	9 29.1	27.0	7.6	3.1	37	240	. .	250	. .	290	30.1	325 47 12.3	. .	− 40.4	16 52 53.1	+ 0.4
26	39 44	10 0.6	27.0	8.9	2.8	33	420	440	. .	. .	. .	30.1	39 48 9.8	. .	+ 49.5	90 55 20.5	+ 1.2
27	55 54	9 28.6	24.4	5.9	1.3	31	. .	475	. .	505	. .	30.1	56 1 14.5	. .	+ 1 28.0	107 9 3.7	+ 9.4
28	284 38	10 4.0	0.9	11.1	7.0	38	. .	. .	. .	435	400	30.2	284 40 50.2	. .	− 3 43.5	335 43 27.9	+ 1.5
29	40 50	9 29.5	25.9	7.7	2.0	35	980	995	. .	. .	. .	30.2	40 53 31.8	. .	+ 51.5	92 0 44.5	+15.4
30	38 4	10 0.6	26.8	8.3	3.2	34	210	230	. .	. .	. .	30.2	38 7 58.0	. .	+ 46.7	89 15 5.9	+ 0.6
31	295 12	3.3	29.6	9.5	6.3	31	385	. .	455	. .	435	30.3	295 16 38.5	. .	− 2 5.4	346 20 54.3	+ 0.7
32	39 34	9 29.9	25.4	7.2	1.8	33	345	335	. .	. .	. .	30.3	39 38 12.6	. .	+ 49.3	90 45 23.1	+ 0.2
33	323 16	10 2.0	29.4	9.4	6.0	38	. .	. .	. .	110	140	30.3	323 18 57.6	. .	− 44.3	14 24 34.5	− 0.1
34	68 48	1.2	26.1	8.3	3.3	34	930	995	. .	. .	. .	30.3	68 51 46.4	. .	+ 2 32.9	120 0 40.5	+ 7.8
35	24 18	1.4	28.8	9.5	4.0	38	540	555	. .	615	600	30.5	24 20 50.8	40.0	+ 27.0	75 27 39.0	+ 2.0
36	47 14	2.3	27.8	9.0	3.0	38	880	905	. .	. .	. .	30.6	47 16 45.9	. .	+ 1 4.6	98 24 11.7	+17.0
37	33 8	9 28.6	25.8	6.7	1.6	37	760	795	. .	850	870	30.6	33 11 5.2	. .	+ 39.1	84 18 5.5	+ 1.6
38	33 52	10 0.2	26.8	8.2	3.0	35	335	345	. .	395	425	30.7	33 55 41.3	38.1	+ 40.3	85 2 42.8	+ 1.2
39	325 8	3.8	0.8	11.3	7.7	37	965	950	. .	. .	. .	30.8	325 10 58.4	. .	− 41.7	16 16 37.9	+ 0.3
40	32 38	9 29.9	27.1	8.7	2.4	32	715	740	. .	. .	. .	30.8	32 42 21.7	. .	+ 38.5	83 49 21.4	+ 1.5
41	76 40	10 1.5	26.4	5.9	2.6	31	. .	. .	. .	350	380	30.8	76 44 43.2	. .	+ 4 9.7	127 55 14.1	+12.0
42	10 26	2.4	1.3	12.0	5.9	37	825	840	. .	875	950	30.9	10 29 0.1	. .	+ 11.1	61 35 32.4	+ 1.3
43	24 20	1.0	27.5	8.5	3.1	36	170	195	. .	220	245	30.9	24 23 28.4	37.0	+ 27.2	75 30 16.8	+ 1.3
44	289 20	0.8	28.0	7.5	4.3	31	350	. .	370	. .	355	31.0	289 24 42.4	. .	− 2 49.0	340 28 14.6	+ 2.3
45	8 38	3.2	1.3	12.0	6.6	32	150	170	. .	170	200	31.1	8 42 27.2	. .	+ 9.2	59 48 57.6	+27.6
46	57 28	4.5	0.7	12.3	6.6	33	260	230	. .	260	320	31.1	57 32 9.8	. .	+ 1 34.3	108 40 5.3	+ 2.1
47	302 56	1.4	27.8	7.8	4.8	31	690	. .	. .	. .	665	31.2	303 0 37.3	. .	− 1 32.4	354 5 26.1	+26.4
48	302 56	1.4	27.8	7.8	4.8	32	830	. .	. .	. .	870	31.2	303 0 19.4	. .	− 1 32.4	354 5 8.2	+ 3.6
49	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
50	33 48	3.2	29.0	10.2	5.1	38	. .	380	. .	395	. .	31.2	33 53 26.2	. .	+ 40.4	85 0 27.6	+24.3

No.	Barom.	At. Ther.
	in.	°
7	30.00	49.0
8	30.01	48.1
14	30.02	48.3
17	30.06	44.2
35	30.07	42.2
38	30.08	41.3
43	30.09	39.7

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
21	− 0.8	+ 8.3	. .	+ 7.5
22	− 0.8	− 8.3	. .	− 9.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Nov. 2	1	B. A. C. 334 . .	P.	36.0	39.1	41.0	48.5	51.0	53.4	0.9	2.7	5.9	2 50.94	− 0.16	. .	− 2.95	1 2 47.83	− 3.57
	2	B. A. C. 362 . .	P.	22.7	25.7	27.5	34.8	37.2	39.5	46.8	48.6	51.6	6 37.16	− 1.45	. .	− 2.95	1 6 32.76	− 3.92
	3	Polaris	P.	. .	. .	8.0	35.0	4.0	27.0	58.0	. .	. .	13 2.40	+41.02	. .	− 2.99	1 13 40.43	− 1.69
	4	θ^1 Ceti.	P.	41.9	44.4	45.9	52.0	54.1	56.1	2.4	3.9	6.5	17 54.13	− 1.00	− 2.96	− 2.99	1 17 50.14	− 0.01
	5	η Piscium . . .	P.	42.3	44.9	46.5	52.8	54.9	57.1	3.4	5.0	7.6	24 54.94	− 0.59	− 2.98	− 2.99	1 24 51.36	+ 0.06
	6	Weisse 767. . . .	P.	9.0	11.6	13.2	19.3	21.3	23.4	29.7	31.2	33.8	44 21.39	− 0.67	.	− 2.95	1 44 17.77	− 3.62
	7	β Arietis	P.	38.4	41.0	42.7	49.2	51.3	53.5	0.0	1.7	4.4	47 51.36	− 0.48	− 2.93	− 2.99	1 47 47.89	− 0.04
	8	B. A. C. 625^1 . .	P.	29.9	32.4	34.0	. .	. .	. .	50.3	51.9	54.4	55 42.15	− 0.81	. .	− 2.95	1 55 38.39	− 3.64
	9	B. A. C. 625^2 . .	P.	. .	. .	38.3	40.3	42.3	44.3	46.4	. .	. .	55 42.32	− 0.81	. .	− 2.95	1 55 38.56	− 3.64
	10	Neptune . . .	P.	26.0	28.5	30.0	36.3	38.4	40.5	46.9	48.3	50.7	59 38.40	− 0.67	. .	− 2.95	1 59 34.78	. .
	11	α Arietis	P.	. .	. .	. .	. .	. .	. .	23.8	25.4	28.3	0 14.93	− 0.43	− 2.93	− 3.00	2 0 11 50	− 0.06
	12	ξ^1 Ceti	P.	17.6	20.1	21.6	27.8	29.9	31.9	38.2	39.8	42.3	6 29.91	− 0.71	− 2.98	− 3.00	2 6 26.20	+ 0.02
	13	ι Cassiopeæ . . .	P.	23.9	30.3	34.2	49.6	54.9	0.1	15.7	19.4	26.0	18 54.90	+ 1.46	. .	− 3.00	2 18 53.36	+ 0.17
	14	5 Ursæ Minoris, S.P.	P.	44.7	33.8	27.0	1.6	52.9	44.6	18.8	11.9	1.7	27 53.00	− 4.85	. .	− 3.00	14 27 45.15	− 0.03
	15	B. A. C. 818 . .	P.	15.3	18.3	20.4	28.2	30.8	33.5	41.3	43.3	46.6	33 30.86	− 1.63	. .	− 2.96	2 33 26.27	− 3.90
	16	γ Ceti.	P.	44.8	47.4	48.9	54.9	57.0	59.0	5.0	6.7	9.3	36 57.00	− 0.80	− 3.03	− 3.01	2 36 53.19	+ 0.02
	17	B. A. C. 855 . .	P.	59.6	2.4	4.5	11.7	14.3	16.7	24.0	25.8	28.8	39 14.20	− 1.49	. .	− 2.96	2 39 9.75	− 3.80
	18	B. A. C. 886 . .	P.	. .	14 8	17.3	19.9	22.3	24.9	30.0	31.8	34.9	45 19.82	− 1.57	. .	− 2.96	2 45 15.29	− 3.82
	19	B. A. C. 910 . .	P.	14.7	17.2	18.7	24.9	26.9	28.9	35.3	36.7	39.3	50 26.96	− 1.00	. .	− 2.96	2 50 23.00	− 3.65
	20	α Ceti.	P.	40.0	42.4	44.0	50.1	57.3	54.3	0.4	2 0	4.5	55 52.22	− 0.78	− 2.94	− 3.01	2 55 48.43	− 0.05
	21	Ianthe	P.	. .	. .	. .	. .	. .	. .	. .	. .	26.9	0 11.32	− 0.08	. .	− 2.96	3 0 8.28	. .
	22	Ate	P.	25.7	28.6	30.2	37.1	39.4	41.5	48.5	50.2	52.8	6 39.33	− 0.37	. .	− 2.96	3 6 36.00	. .
	23	B. A. C. 1040 . .	P.	35.4	38.3	40.0	46.8	49.0	51.3	58.3	0.1	2.9	14 49.12	− 0.34	. .	− 2.96	3 14 45.82	− 4.02
	24	B. A. C. 1057 . .	P.	0.4	2.8	4.4	10.7	12.7	14.8	20.8	22.4	25.0	18 12.67	− 0.70	. .	− 2.96	3 18 9.01	− 3.74
	25	Clotho	P.	2.7	5.3	6.7	13.0	15.0	17.0	23.3	24.6	27.4	29 15.00	− 0.89	. .	− 2.96	3 29 11.15	. .
	26	Egeria	P.	28.3	31.0	32.7	39.3	41.6	43.9	50.5	52.0	55.0	37 41.59	− 0.43	. .	− 2.96	3 37 38.20	. .
	27	B. A. C. 1212 . .	P.	26.4	29.0	30.6	36.5	38.8	40.8	46.9	48.4	51.0	46 38.71	− 0.95	. .	− 2.97	3 46 34.79	− 3.60
	28	Pomona . . .	P.	36.5	39.6	41.4	47.4	49.7	52.0	58.3	59.9	2.5	49 49.70	− 0.52	. .	− 2.97	3 46 46.21	. .
	29	B. A. C. 1265 . .	P.	10.3	13.3	15.1	21.9	24.3	26.6	33.6	35.4	38.3	59 24.31	− 0.31	. .	− 2.97	3 59 21.03	− 4.12
	30	Groom. 2320, S. P.	P.	39.1	35.3	14.1	8 6	2.9	57.5	52.1	40.8	37.0	6 3.04	− 3.32	. .	− 3.02	16 5 56.90	+ 0.25
	31	B. A. C. 1370 . .	P.	27.5	30.0	31.7	38.0	40.1	42.2	48.6	50.0	52.8	19 40.10	− 0.59	. .	− 2.97	4 19 36.54	− 3.80
	32	γ Tauri	P.	13.6	16.3	17.9	24.3	26.5	28.6	35.2	36.8	39.4	21 26.51	− 0.51	− 2.99	− 3.02	4 21 22.98	− 0.04
	33	α Tauri	P.	39.5	42.2	43.8	50.2	52.3	54.4	0.7	2.4	4.9	28 52.27	− 0.55	− 2.94	− 3.02	4 28 48.70	− 0.10
	34	ι Aurigæ . . .	P.	44.1	47.1	49.0	56.3	58.7	1.2	8.4	10.2	13.3	48 58.70	− 0.21	− 2.98	− 3.03	4 48 55.46	− 0.09
	35	ε Ursæ Minoris, S.P.	P.	20.5	. .	50.0	. .	. .	. .	. .	. .	. .	58 49.80	− 8.16	. .	− 3.03	16 58 38.61	− 0.29
4	36	ε Piscium . . .	F.	23.3	25.9	27.3	33.4	35.5	37.6	43.7	45.2	47.7	56 35.51	− 0.77	− 3.82	− 3.72	0 56 31.02	+ 0.12
	37	Polaris	F.	. .	. .	9.0	35.5	2.0	28.5	55.0	. .	. .	13 2.00	+43.02	. .	− 3.72	1 13 41.30	− 0.27
	38	θ^1 Ceti	F.	42.5	45.2	46.8	52.9	55.0	57.1	3.2	4.7	7.4	17 54.98	− 1.06	− 3.75	− 3.72	1 17 50.20	+ 0.05
	39	η Piscium . . .	F.	43.1	45.7	47.2	53.6	55.7	57.9	4.0	5.8	8.4	24 55.71	− 0.63	− 3.71	− 3.72	1 24 51.36	+ 0.06
	40	ο Piscium . . .	F.	43.4	46.0	47.5	53.7	55.7	57.9	3.8	5.5	8.1	38 55.73	− 0.75	− 3.67	− 3.73	1 38 51.25	− 0.09
	41	β Arietis	F.	39.1	41.8	43.6	50.0	52.2	54.4	0.9	2.5	5.3	47 52.20	− 0.52	− 3.72	− 3.73	1 47 47.95	+ 0.01
	42	α Arietis	F.	2.5	5.3	6.8	13.5	15.7	17.9	24.6	26.2	29.0	0 15.72	− 0.46	− 3.68	− 3.73	2 0 11.53	− 0.04
5	43	Moon I, S. . . .	P.	12.6	15.5	17.1	24.0	26.3	28.6	35.4	37.0	39.8	45 26.26	− 1.45	. .	− 3.84	20 45 20.97	+67.86
	44	σ^2 Ursæ Majoris, S.P.	P.	6.9	0.4	56.3	40.3	34.9	29.5	13.3	9.4	**2.7**	59 34.86	− 3.65	. .	− 3.79	8 59 27.42	+ 0.09
	45	61^1 Cygni	P.	7.8	11.0	12.9	20.7	23.3	25.8	33.6	35.5	**38.8**	1 23.27	− 0 05	− 3.75	− 3.79	21 1 19.43	− 0.08
	46	Tran. Zones 182, 75	P.	0.8	3.4	5.4	11.6	13.8	16.0	22.7	24.3	**27.0**	8 13.91	− 1.40	. .	− 3.84	21 8 8.67	− 2.90
	47	B. A. C. 7399 . .	P.	37.7	40.7	42.7	50.0	52.5	54.9	2.4	4.3	7.3	12 52.50	− 0.16	. .	− 3.84	21 12 48.50	− 1.69
	48	ι Pegasi	P.	11.9	14.6	16.0	22.7	24.8	26.9	33.6	35.1	38.0	16 24.84	− 0.54	− 3.85	− 3.79	21 16 20.51	+ 0.01
	49	β Aquarii. . . .	P.	54.0	56.5	58.0	4.0	6.2	8.3	14.5	15.9	18.6	25 6.22	− 1.06	− 3.82	− 3.80	21 25 1.36	+ 0.05
	50	β Cephei	P.	35.6	40.2	51.9	58.1	4.0	10.0	16.0	27.8	32.4	27 4.00	+ 2.14	. .	− 3.80	21 27 2.34	+ 0.26

14, 30, 43, 44, 50. Bisections at sets B and D.
21, 22, 25, 26, 28. Wire A used.
46. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	3 52	10 1.0	29.3	9.5	3.2	35	. .	220	. .	250	. .	31.2	3 55 43.0	. .	+ 4.1	55 2 8.3	+27.6
2	70 14	0.5	25.5	7.0	3.0	32	465	485	. .	. .	. .	31.3	70 18 26.1	. .	+ 2 46.9	121 27 31.2	+18.3
3	310 12	4.2	1.0	11.0	7.4	34	600	550	530	550	570	31.3	310 15 50.7	. .	− 1 11.1	1 21 0.8	+ 0.4
4	47 38	2.4	28.5	9.1	3.5	34	305	320	. .	395	400	31.3	47 41 56.1	. .	+ 1 6.2	98 49 23.5	+ 3.0
5	24 8	0.9	28.3	9.3	3.9	39	. .	015	. .	130	. .	31.4	24 10 44.4	34.6	+ 27.1	75 17 32.7	+ 2.1
6	28 24	9 28.8	26.2	6.8	2.5	37	050	060	. .	. .	. .	31.5	28 27 17.1	. .	+ 32.7	79 34 11.0	+25.1
7	18 38	10 3.0	0.8	12.5	5.4	37	400	435	. .	410	420	31.5	18 41 7.7	. .	+ 20.4	69 47 49.3	+ 2.0
8	36 38	1.5	28.4	10.0	4.0	30	545	. .	. .	. .	600	31.6	36 42 54.2	. .	+ 45.1	87 50 0.5	+24.4
9	36 38	1.5	28.4	10.0	4.0	30	. .	340	. .	370	. .	31.6	36 42 57.6	. .	+ 45.1	87 50 3.9	+24.4
10	28 34	1.5	28.5	8.9	3.0	36	860	850	. .	. .	. .	31.6	28 37 18.3	. .	+ 33.0	79 44 12.5	. .
11	15 58	3.5	1.0	12.5	6.0	38	. .	. .	. .	935	950	31.6	16 0 44.4	. .	+ 17.3	67 7 22.9	+ 2.2
12	30 34	9 29.2	25.6	7.0	2.6	37	860	865	. .	885	920	31.6	30 37 4.8	33.7	+ 35.8	81 44 1.8	+ 0.2
13	332 0	29.3	25.5	7.0	3.3	36	350	310	. .	290	370	31.7	332 3 29.6	. .	− 32.0	23 9 18.8	0.0
14	295 6	10 5.2	1.5	11.5	7.8	31	570	. .	540	. .	560	31.7	295 10 36.1	. .	− 2 8.0	346 14 49.3	+ 3.3
15	77 16	4.0	0.2	9.3	5.9	31	230	265	. .	. .	. .	31.8	77 20 42.0	. .	+ 4 23.5	128 31 26.7	+21.8
16	36 6	4.1	29.5	10.6	4.3	33	860	875	. .	. .	. .	31.8	36 10 2.6	. .	+ 44.2	87 17 8.0	+ 0.7
17	71 50	2.3	28.0	7.5	4.0	36	. .	195	. .	285	. .	31.8	71 53 28.0	. .	+ 3 2.9	123 2 52.1	+22.4
18	75 8	2.0	27.4	7.4	4.6	36	. .	. .	. .	990	020	31.8	75 11 16.6	. .	+ 3 45.1	126 21 22.9	+22.4
19	48 12	0.5	25.8	7.0	1.4	34	. .	490	. .	540	. .	31.9	48 15 56.4	. .	+ 1 7.7	99 23 25.3	+23.7
20	35 12	1.6	27.4	9.3	3.1	31	550	520	. .	. .	. .	31.9	35 16 40.2	. .	+ 42.7	86 23 44.1	+ 0.7
21	0 58	2.6	29.9	10.0	4.9	37	. .	. .	. .	430	500	31.9	1 3 41.8	. .	+ 1.1	52 10 11.1	− 0.1
22	12 52	0.0	28.1	9.4	3.5	38	. .	030	. .	955	. .	32.0	12 57 34.8	. .	+ 13.9	64 4 9.9	− 1.3
23	11 40	0.6	27.1	9.8	3.1	35	490	500	. .	. .	. .	32.0	11 43 40.1	. .	+ 12.6	62 50 13.9	+21.7
24	30 14	0.5	26.8	8.8	2.5	36	350	375	. .	. .	. .	32.0	30 17 26.1	. .	+ 35.3	81 24 22.6	+22.8
25	41 4	1.0	25.5	8.3	2.6	41	. .	490	. .	510	. .	32.1	41 8 42.0	. .	+ 52.8	92 15 56.0	− 5.5
26	15 38	2.9	0.0	11.5	6.0	38	. .	. .	. .	305	. .	32.2	15 43 28.1	. .	+ 17.0	66 50 6.3	− 1.6
27	44 32	2.4	27.4	8.5	3.1	32	435	460	. .	. .	. .	32.2	44 36 26.4	. .	+ 59.6	95 43 47.2	+22.8
28	20 28	3.7	29.9	11.8	4.9	37	. .	. .	. .	110	. .	32.2	20 33 46.4	. .	+ 22.7	71 40 30.3	− 1.7
29	10 10	2.7	0.0	11.3	5.5	36	070	030	. .	. .	. .	32.3	10 13 29.7	. .	+ 10.9	61 20 1.8	+18.4
30	287 2	2.2	27.9	8.6	5.4	37	385	. .	455	. .	410	32.3	287 5 10.0	. .	− 3 14.5	338 8 16.7	+ 1 5
31	24 24	0.1	27.9	8.5	3.4	37	575	570	. .	. .	. .	32.4	24 27 8.7	. .	+ 27.5	75 33 57.4	+19.1
32	19 56	4.6	0.9	12.7	6.5	38	. .	160	. .	195	. .	32.4	19 58 56.1	. .	+ 22.0	71 5 39.3	+ 3.3
33	22 34	29.9	27.5	9.0	2.4	35	825	835	. .	885	905	32.5	22 37 35.6	. .	+ 25.2	73 44 22.0	+ 3.0
34	5 52	9 28.3	27.2	7.5	2.0	36	. .	785	. .	815	. .	32.6	5 55 22.4	33.5	+ 6.3	57 1 49.9	+ 1.4
35	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. . .
36	31 36	27.5	23.3	6.3	1.4	35	. .	858	. .	836	. .	31.3	31 39 37.1	. .	+ 36.8	82 46 35.1	+ 0.2
37	310 12	10 2.1	29.6	9.0	5.6	34	774	758	756	756	740	31.3	310 15 49.6	37.2	− 1 10.4	1 21 0.4	+ 0.8
38	47 38	3.9	0.0	10.2	5.7	34	. .	308	. .	312	. .	31.3	47 41 55.2	. .	+ 1 5.5	8 49 21.9	+ 1.2
39	24 8	9 23.3	21.8	3.7	28.0	39	. .	532	. .	552	. .	31.3	24 10 43.5	. .	+ 26.8	75 17 31.5	+ 1.0
40	30 18	10 2.1	28.6	9.8	5.0	38	. .	054	. .	082	. .	31.3	30 20 58.8	. .	+ 34.8	81 27 54.8	+ 0.2
41	18 38	9 29.0	26.0	8.6	2.3	37	. .	. .	. .	800	812	31.3	18 41 5.7	. .	+ 20.2	69 47 47.1	− 0.1
42	15 58	26.2	23.9	6.0	0.3	39	. .	. .	. .	424	424	31.3	16 0 43.3	38.0	+ 17.1	67 7 21.6	+ 1.1
43	62 30	10 0.6	26.0	7.5	3.3	35	145	. .	240	. .	385	32.7	62 33 45.2	. .	+ 1 54.5	113 42 0.9	. .
44	286 32	2.1	26.6	8.0	4.5	38	. .	. .	150	. .	090	32.7	286 35 0.5	. .	− 3 18.1	337 38 3.6	+ 2.8
45	0 42	0.4	27.7	8.5	3.5	37	. .	. .	. .	770	. .	32.7	0 45 6.6	37.5	+ 0.8	51 51 28.6	+ 2.1
46	60 42	9 29.5	26.0	7.3	3.5	45	. .	840	. .	885	. .	32.7	60 40 30.2	. .	+ 1 46.0	111 48 37.4	+ 3 5
47	4 28	10 5.5	1.6	12.0	7.0	38	560	540	. .	. .	. .	32.7	4 30 50.2	. .	+ 4.7	55 37 16.1	+21.6
48	19 32	9 29.9	26.9	8.8	3.0	31	. .	. .	. .	332	330	32.7	19 36 45.6	. .	+ 21.3	70 43 28.1	+ 2.1
49	44 56	10 1.5	27.3	9.6	3.6	35	415	420	. .	. .	. .	32.7	44 59 41.2	. .	+ 59.8	96 7 2.2	+ 1.9
50	328 50	1.0	26.3	7.6	3.4	37	. .	. .	940	. .	965	32.7	328 53 3.9	. .	− 36.2	19 58 48.9	− 1.5

No.	Barom.	At. Ther.
	in.	°
5	30.09	38.1
12	30.08	37.3
34	30.85	36.5
37	29.93	41.2
42	29.91	41.0
45	29.98	40.0

For summary of the elements of reduction see page 3.

No	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
10	− 0.1	. .	. .	− 0.1
43	−48 59.3	− 15 6.6	. .	−1 4 5.9

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Nov. 5	1	ξ Aquarii.	P	1.0	3.7	5.3	11.4	13.5	15.6	21.7	23.3	25.8	31 13.48	— 1.11	— 3.86	— 3.80	21 31 8.57	+ 0.08
	2	ε Pegasi	P.	57.4	0.0	1.5	7.6	9.8	11.9	18.2	19.6	22.2	38 9.80	— 0.76	— 3.78	— 3.80	21 38 5.24	— 0.01
	3	μ Capricorni.	P.	24.0	26.8	28.4	34.7	36.7	38.9	45.3	46.6	49.4	46 36.76	— 1.23	— 3.78	— 3.80	21 46 31.73	+ 0.01
	4	79 Draconis	P.	37.7	51.2	5.5	12.9	19.7	26.6	33.9	47.9	2.1	51 19.72	+ 2.77	. .	— 3.80	21 51 18.69	+ 0.21
	5	B. A. C. 7684	P.	27.8	31.3	33.2	41.3	43.8	46.5	54.3	56.4	59.8	58 43.82	— 1.91	. .	— 3.84	21 58 38.07	— 3.70
	6	α Aquarii.	P.	. .	. .	. .	. .	. .	33.6	37.6	39.1	41.6	59 29.42	— 0.95	— 3.92	— 3.80	21 59 24.67	+ 0.15
	7	B. A. C. 7714	P.	43.5	46.5	48.3	55.6	57.9	0.5	7.9	9.7	12.7	2 58.07	— 1.69	. .	— 3.84	22 2 52.54	— 3.49
	8	θ Aquarii.	P.	9.8	12.3	13.8	20.0	22.2	24.3	30.4	32.0	34.6	10 22.16	— 1.11	— 3.90	— 3.81	22 10 17.24	+ 0.11
	9	B. A. C. 7795	P.	7.4	9.9	11.4	17.5	19.6	21.8	27.8	29.3	31.9	15 19.62	— 0.98	. .	— 3.84	22 15 14.80	— 2.84
	10	λ Aquarii.	P.	1.2	3.9	5.5	11.5	13.6	15.7	21.8	23.4	26.0	46 13.62	— 1.11	— 3.85	— 3.81	22 46 8.70	+ 0.12
	11	α Piscis Australis	P.	39.3	42.2	43.9	51.0	53.4	55.7	2.9	4.7	7.6	50 53.41	— 1.61	— 3.75	— 3.81	22 50 47.99	— 0.02
	12	B. A. C. 7998	P.	. .	. .	41.4	44.2	46.5	49.0	51.5	. .	. .	51 46.52	— 1.78	. .	— 3.85	22 51 40.89	— 3.79
	13	α Pegasi	P.	26.7	29.4	31.0	37.3	39.4	41.6	47.9	49.5	52.1	58 39.43	— 0.65	— 3.81	— 3.81	22 58 34.97	+ 0.03
	14	Lalande 45562.	P.	25.2	27.8	29.4	35.5	37.6	39.7	45.9	47.3	50.0	10 37.60	— 1.10	. .	— 3.85	23 10 32.65	— 3.21
	15	o Cephei	P.	2.8	9.2	13.3	29.2	34.7	39.8	56.0	59.7	6.7	13 34.60	+ 1.77	. .	— 3.81	23 13 32.56	+ 0.20
	16	θ Piscium	P.	33.0	35.6	37.2	43.3	45.4	47.4	53.6	55.1	57.7	21 45.37	— 0.83	— 3.79	— 3.82	23 21 40.72	+ 0.03
	17	λ Draconis, S. P.	P.	43.3	35.5	31.3	13.7	7.5	1.5	43.7	39.3	31.9	24 7.52	— 4.03	. .	— 3.82	11 23 59.67	— 0.18
	18	ι Piscium	P.	26.8	29.4	30.9	37.0	39.1	41.2	47.3	48.8	51.4	33 39.10	— 0.84	— 3.77	— 3.82	23 33 49.44	— 0.05
	19	Groombridge 4163	P.	6.9	16.3	21.6	43.4	50.4	58.2	19.8	25.2	34.4	49 50.69	+ 2.93	. .	— 3.82	23 48 34.80	+ 0.23
	20	ω Piscium	P.	49.3	51.8	53.4	59.6	1.6	3.6	9.9	11.3	13.8	53 1.59	— 0.82	— 3.93	— 3.97	23 52 56.80	— 0.03
	21	B. A. C. 8352	P.	50.3	53.2	55.0	1.9	4.4	6.7	13.8	15.4	18.4	56 4.34	— 1.62	. .	— 3.85	23 55 58.87	— 3.81
	22	B. A. C. 8357	P.	55.7	59.0	0.8	8.3	10.9	13.5	21.3	23.0	26.3	57 10.98	— 1.80	. .	— 3.85	23 57 5.33	— 4.00
	23	α Andromedæ	E.	49.2	52.0	53.9	0.9	3.2	5.5	12.5	14.2	17.0	2 3.16	— 0.33	— 3.95	— 3.97	0 1 58.86	0.00
	24	B. A. C. 22	P.	51.9	55.4	57.4	5.6	8.3	11.0	19.2	21 2	24.6	5 8.29	— 1.95	. .	— 3.85	0 5 2.49	— 4.15
	25	γ Pegasi	E.	43.4	45.9	47.4	53.8	55.9	58.0	4.2	5.8	8.5	6 55.88	— 0.64	— 3.99	— 3.97	0 6 51.27	+ 0.02
	26	B. A. C. 38	P.	51.5	54.9	57.0	5.2	7.6	10.4	18.6	20.6	24.0	9 7.76	— 1.93	. .	— 3.85	0 9 1.98	— 4.14
	27	Polaris	P.	20.0	6.0	10.0	31.0	0.0	23.0	46.0	49.0	37.0	12 58.00	+46.78	. .	— 3.83	1 13 40.95	— 0.26
	28	o Piscium	P.	43.6	46.1	47.6	53.8	55.9	58.0	4.1	5.7	8.3	38 55.90	— 0.77	— 3.82	— 3.84	1 38 51.29	— 0.05
	29	Weisse 767	P.	9.9	12.5	14.0	20.2	22.3	24.4	30.7	32.2	34.8	44 22.33	— 0.73	. .	— 3.86	1 44 17.74	— 3.64
	30	β Arietis	P.	39.3	42.0	43.6	50.1	52.3	54.4	0.9	2.6	5.2	47 52.27	— 0.52	— 3.79	— 3.84	1 47 47.91	— 0.03
	31	Neptune	P.	8.0	10.6	12.0	18.4	20.5	22.5	28.7	30.3	32.9	59 20.43	— 0.74	. .	— 3.86	1 59 15.83	. .
	32	α Arietis	P.	2.5	5.3	6.9	13.6	15.9	18.1	24.6	26.3	29.1	0 15.81	— 0.46	— 3.76	— 3.84	2 0 11.51	— 0.07
	33	ξ^1 Ceti	E.	18.6	21.2	22.7	28.9	31.0	33.0	39.4	40.9	43.4	6 31.01	— 0.78	— 3.99	— 3.99	2 6 26.24	+ 0.04
	34	γ Ceti	E.	45.9	48.4	50.0	56.0	58.1	0.2	6.2	7.8	10.5	36 58.12	— 0.89	— 4.03	— 4.00	2 36 53.23	+ 0.03
	35	B. A. C. 878[1]	P.	32.5	35.6	37.7	45.3	47.9	50.8	58.4	0.4	3.8	43 48.04	— 1.84	. .	— 3.86	2 43 42.34	— 3.88
	36	B. A. C. 902	P.	34.3	37.5	39.5	47.4	50.0	52.6	0.4	2.4	5.7	48 49.98	— 1.87	. .	— 3.86	2 48 44.25	— 3.88
	37	Ianthe	P.	20.7	24.2	26.2	31.4	34.0	36.9	39.3	. .	46.9	56 36.58	— 0.06	. .	— 3.86	2 56 32.66	. .
	38	Ate	P.	30.2	33.2	34.7	41.6	43.8	46.2	52.9	54.5	57.4	3 43.83	— 0.40	. .	— 3.86	3 3 39.57	. .
	39	B. A. C. 1021	P.	33.2	36.3	38.2	45.4	48.2	50.5	58.2	0.0	3.3	11 48.14	— 1.78	. .	— 3.86	3 11 42.50	— 3.75
	40	B A. C. 1060	P.	38.1	41.2	43.1	50.3	52.6	55.2	2.4	4.3	7.2	18 52.71	— 1.69	. .	— 3.86	3 18 47.16	— 3.70
	41	Clotho	P.	0.5	3.0	4.5	10.8	12.8	14.9	21.2	22.4	25.1	27 12.80	— 0.99	. .	— 3.86	3 27 7.95	. .
	42	Egeria	P.	9.9	12.5	14.3	20.7	22.9	25.3	31.0	33.7	36.4	34 23.07	— 0.45	. .	— 3.86	3 34 18.76	. .
	43	B. A. C. 1194	P.	47.7	50.7	52.5	59.7	2.1	4.4	11.5	13.3	14.2	43 2.02	— 1.62	. .	— 3.86	3 42 56.54	— 3.59
	44	Pomona	P.	5.7	8.2	9.9	16.3	18.4	20.5	27.0	28.5	31.1	47 18.40	— 0.57	. .	— 3.86	3 47 13.97	. .
	45	B. A. C. 1342	P.	56.9	59.7	1.4	7.9	10.2	12.3	18.7	20.4	23.2	15 10.08	— 0.52	. .	— 3.87	4 15 5.69	— 3.98
	46	B. A. C. 1361	P.	35.5	38.2	39.8	46.4	48.5	50.7	57.1	58.7	1.5	17 48.49	— 0.56	. .	— 3.87	4 17 44.06	— 3.94
	47	ε Tauri	P.	14.6	17.2	18.9	25.3	27.5	29.7	36.1	37.8	40.4	21 27.50	— 0.55	— 3.88	— 3.87	4 21 23.08	0.00
	48	α Tauri	P.	40.6	43.1	44.8	51.2	53.2	55.4	1.7	3.4	6.0	28 53.27	— 0.61	— 3.82	— 3.87	4 28 48.79	— 0.07
	49	ι Aurigæ.	P.	45.2	48.2	50.0	57.3	59.5	2.0	9.4	11.3	14.3	48 59.69	— 0.20	— 3.90	— 3.87	4 48 55.62	— 0.01
	50	ε Ursæ Minoris, S.P.	P.	21.0	2.0	51.5	5.5	50.0	35.0	50.0	39.0	19.5	58 50.39	— 9.14	. .	— 3.87	16 58 37.38	— 1.33

4, 15, 17, 19. Bisections at sets B and D.
37, 38, 41, 42, 44. Wire A used.
50. Bisections at set C.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	47 14	10 1.0	26.9	9.0	3.2	37	305	245	. .	. .	. .	32.7	47 17 13.3	. .	+ 1 4.9	98 24 39.4	+ 0.9
2	29 30	0.2	26.8	7.8	3.0	31	700	685	. .	. .	. .	32.7	29 34 39.5	. .	+ 34.0	80 41 34.7	+ 2.2
3	52 56	4.1	29.1	11.5	5.6	32	000	050	. .	. .	. .	32.7	53 0 31.0	. .	+ 1 19.5	104 8 11.7	+ 1.7
4	325 44	9 27.3	25.1	6.6	2.4	37	520	. .	490	. .	500	32.7	325 47 12.6	. .	— 40.8	356 52 53.0	+ 0.7
5	78 54	10 1.5	26.9	6.0	3.5	36	550	615	. .	. .	. .	32.7	78 57 24.1	. .	+ 4 59.4	130 8 44.7	+ 1.2
6	39 44	9 28.9	24.0	6.5	1.2	33	. .	. .	. .	850	880	32.7	39 48 8.6	. .	+ 50.0	0 55 19.8	+ 0.4
7	71 56	10 1.2	25.1	6.5	3.4	33	. .	495	. .	450	. .	32.7	72 0 12.7	. .	+ 3 3.1	123 9 37.0	+ 3.9
8	47 12	1.6	26.6	8.9	4.5	31	. .	620	. .	670	. .	32.7	47 16 39.5	. .	+ 1 5.1	98 24 5.8	+ 1.6
9	40 50	9 27.8	23.2	6.4	0.5	36	. .	285	. .	310	. .	32.7	40 53 31.7	33.9	+ 52.1	92 0 45.0	+15.3
10	47 4	27.8	24.8	6.0	0.8	38	380	390	. .	. .	. .	32.7	47 6 59.0	33.4	+ 1 4.9	98 14 25.1	+ 2.4
11	69 4	29.0	24.5	5.2	1.6	34	535	575	. .	. .	. .	32.7	69 7 57.1	. .	+ 2 37.0	120 16 55.3	+ 1.5
12	74 58	10 2.6	26.3	6.5	4.0	37	. .	. .	. .	760	650	32.7	75 1 7.2	. .	+ 3 41.9	126 11 10.3	+ 6.8
13	24 18	3.7	29.1	10.5	5.3	38	680	650	. .	660	640	32.7	24 20 50.5	. .	+ 27.3	75 27 39.0	+ 2.1
14	46 40	0.0	24.5	7.3	1.9	38	395	435	. .	. .	. .	32.7	46 42 57.8	. .	+ 1 4.0	97 50 23.0	+17.0
15	331 24	9 26.5	23.5	4.6	1.6	34	425	. .	420	. .	415	32.7	331 28 1.0	. .	— 32.8	22 33 49.4	— 0.9
16	33 8	10 2.1	26.6	8.6	4.5	37	810	808	. .	. .	. .	32.7	33 11 4.8	. .	+ 39.5	84 18 5.5	+ 1.6
17	288 54	1.3	26.5	7.4	4.8	36	752	. .	770	. .	790	32.7	288 57 21.3	. .	— 2 54.0	340 0 48.5	+ 2.6
18	33 52	0.0	25.9	8.1	3.2	35	550	540	. .	575	570	32.7	33 55 39.7	33.2	+ 40.6	85 2 41.5	— 0.2
19	325 8	0.3	26.7	9.0	4.5	38	280	. .	285	. .	285	32.7	325 10 58.4	. .	— 42.0	16 16 37.6	+ 0.8
20	32 38	0.5	26.8	10.0	3.3	32	. .	810	. .	830	. .	32.7	32 42 21.8	. .	+ 38.8	83 49 21.8	+ 1.9
21	69 12	3.0	27.0	9.0	5.0	34	880	935	. .	. .	. .	32.7	69 15 48.3	. .	+ 2 38.3	120 24 47.8	+13.4
22	75 44	0.7	24.1	6.9	2.5	40	. .	. .	. .	545	595	32.7	75 46 24.6	. .	+ 3 54.2	126 56 40.0	+11.8
23	10 26	2.7	0.4	11.5	6.1	37	. .	975	. .	985	. .	32.7	10 29 0.5	. .	+ 11.2	61 35 32.9	+ 2.1
24	79 48	9 24.1	20.5	2.0	27.8	34	095	020	. .	. .	. .	32.7	79 52 8.6	. .	+ 5 27.0	131 3 56.8	+11.4
25	24 20	10 0.5	25.6	7.8	1.6	36	. .	440	. .	480	. .	32.7	24 23 27.4	. .	+ 27.4	75 30 16.0	+ 0.6
26	79 32	2.7	27.3	8.2	4.3	35	775	815	. .	. .	. .	32.7	79 35 35.0	32.7	+ 5 18.8	130 47 15.0	+11.7
27	310 12	1.0	27.5	7.5	4.0	34	905	900	860	870	890	32.7	310 15 50.7	31.0	— 1 11.6	1 21 0.3	+ 1.1
28	30 18	0.8	26.5	8.3	4.3	38	. .	225	. .	265	270	32.7	30 20 58.9	. .	+ 35.6	81 27 55.7	+ 1.1
29	28 24	9 27.2	23.3	5.5	0.1	37	305	280	. .	. .	. .	32.7	28 27 16.7	. .	+ 32.9	79 34 10.8	+25.1
30	18 38	10 3.1	29.8	12.1	6.0	37	465	460	. .	475	510	32.7	18 41 8.0	. .	+ 20.5	69 47 49.7	+ 2.6
31	28 36	9 28.8	24.0	6.8	1.2	38	425	430	. .	. .	. .	32.7	28 38 58.1	. .	+ 33.2	79 45 52.5	. .
32	15 58	25.0	22.8	5.3	29.3	39	. .	. .	. .	540	545	32.7	16 0 44.0	. .	+ 17.4	67 7 22.6	+ 2.0
33	30 34	29.2	24.0	6.9	1.8	37	. .	895	. .	980	. .	32.7	30 37 5.6	30.3	+ 35.9	81 44 2.7	+ 1.1
34	36 6	10 2.0	28.0	11.0	4.7	33	. .	880	. .	980	. .	32.7	36 10 3.5	. .	+ 44.4	87 17 9.1	+ 1.7
35	76 40	1.3	25.0	5.6	3.4	32	190	225	. .	. .	. .	32.7	76 44 31.7	. .	+ 4 12.5	127 55 5.4	+21.4
36	77 42	4.5	28.3	8.0	5.8	35	280	265	. .	. .	. .	32.7	77 45 42.0	. .	+ 4 34.2	128 56 37.4	+21.6
37	0 54	0.0	27.0	8.1	2.5	34	. .	. .	. .	890	. .	32.7	1 0 24.2	. .	+ 1.1	52 6 46.5	— 0.1
38	13 2	2.0	29.0	10.2	5.0	35	. .	580	. .	660	. .	32.7	13 8 10.6	. .	+ 14.2	64 14 46.0	— 1.4
39	74 56	2.9	26.9	7.5	4.0	39	360	335	. .	. .	. .	32.7	74 58 40.9	29.7	+ 3 43.3	126 8 45.4	+22.5
40	71 54	9 28.8	23.3	5.5	1.0	29	. .	. .	. .	505	400	32.7	71 59 16.3	. .	+ 3 5.1	123 8 42.6	+22.8
41	41 28	10 3.0	27.2	10.2	4.2	35	. .	715	. .	740	. .	32.7	41 34 9.1	. .	+ 53.9	92 41 24.2	— 5.6
42	15 26	1.5	29.9	11.3	5.2	40	. .	500	. .	555	. .	32.7	15 30 55.0	. .	+ 16.9	66 37 33.1	— 1.6
43	69 20	9 29.3	23.3	5.5	1.4	36	985	005	. .	. .	. .	32.7	69 23 20.0	. .	+ 2 40.5	120 32 21.7	+23.2
44	20 42	10 0.0	26.4	9.5	3.1	36	. .	290	. .	225	. .	32.7	20 48 2.5	. .	+ 23.1	71 54 46.8	— 1.8
45	18 18	0.5	28.7	10.0	4.6	35	. .	. .	. .	920	905	32.7	18 21 34.2	. .	+ 20.1	69 28 15.5	+18.6
46	20 4	9 27.0	23.8	7.1	0.9	35	140	185	. .	. .	. .	32.7	20 7 48.7	. .	+ 22.3	71 14 32.2	+18.6
47	19 56	10 2.0	28.0	10.7	4.5	38	. .	440	. .	475	. .	32.7	19 58 54.4	. .	+ 22.1	71 5 37.7	+ 1.7
48	22 34	9 29.5	26.0	7.9	1.8	36	050	035	. .	055	075	32.7	22 37 33.8	. .	+ 25.8	73 44 20.8	+ 1.8
49	5 52	28.3	26.5	8.2	2.2	36	885	915	. .	900	930	32.7	5 55 20.9	. .	+ 6.3	57 1 48.4	+ 0.2
50	301 6	10 3.8	28.8	10.0	7.0	35	475	480	485	460	482	32.7	301 9 38.8	29.5	— 1 40.4	352 14 19.6	— 0.4

No.	Barom.	At. Ther.
	in.	°
9	29.98	37.0
10	30.00	38.0
18	30.00	36.4
26	30.01	35.5
27	30.04	34.5
33	30.03	33.7
39	30.02	33.0
50	30.04	32.4

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
31	— 0.1	. .	. .	— 0.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Nov. 5	1	η Virginis . . .	Sk.	24.7	27.1	28.8	32.7	36.9	41.1	45.2	46.7	49.2	13 36.93	— 0.91	— 3.91	— 3.91	12 13 32.11	— 0.02
	2	12 Canum Venat. .	Sk.	0.2	3.3	5.5	13.1	15.8	18.6	26.6	28.4	31.7	50 15.91	— 0.10	— 3.84	— 3.92	12 50 11.89	— 0.08
	3	Polaris, S. P. . .	Sk.	. .	19.0	56.0	29.0	4.0	35.5	39.5	37.0	46.5	14 28.25	—44.54	. .	— 3.92	1 13 39.79	— 1.23
	4	α Virginis . . .	Sk.	30.3	32.9	34.5	40.6	42.8	44.9	51.1	52.6	55.3	18 42.78	— 1.11	— 3.91	— 3.92	13 18 37.75	— 0.03
	5	η Bootis	Sk.	36.7	39.4	40.9	47.4	49.7	51.8	58.1	59.9	2.5	48 49.60	— 0.58	— 3.93	— 3.93	13 48 45.09	— 0.05
	6	Mercury II, S.. .	Sk.	17.3	20.0	21.5	27.6	29.7	31.8	38.1	39.5	42.0	52 29.72	— 1.10	. .	— 3.92	13 52 24.70	— 0.30
6	7	Sun I, N. . . .	Sk.	29.2	31.9	33.4	39.6	41.6	44.0	50.5	52.0	54.6	44 41.87	— 1.21	. .	— 3.94	14 44 36.72	. .
	8	Sun II, S. . . .	Sk.	44.0	46.7	48.2	54.6	56.7	58.8	5.4	6.9	9.7	46 56.78	— 1.21	. .	— 3.94	14 46 51.63	. .
	9	α Coronæ Borealis .	Sk.	14.9	17.9	19.6	26.5	28.7	31.2	38.0	39.7	42.6	29 28.79	— 0.40	— 3.92	— 3.95	15 29 24.44	— 0.03
	10	α Serpentis . . .	Sk.	. .	8.4	10.5	12.6	14.6	16.7	20.8	22.3	24.9	38 12.56	— 0.80	— 4.00	— 3.96	15 38 7.80	+ 0.06
	11	Mars I, S. . . .	Sk.	37.4	39.9	41.8	. .	. .	. .	59.3	0.9	3.4	49 50.45	— 1.27	. .	— 4.01	20 49 45.17	+ 0.55
	12	Mars II, N. . .	Sk.	. .	. .	47.0	49.2	51.5	53.6	55.7	. .	. .	49 51.40	— 1.27	. .	— 4.01	20 49 46.12	— 0.40
	13	ζ Cygni	Sk.	28.9	31.8	33.5	40.6	43.0	45.3	52.4	54.1	57.0	7 42.96	— 0.31	— 3.91	— 4.03	21 7 38.62	— 0.11
	14	B. A. C. 7398 . .	Sk.	20.1	23.5	25.3	33.3	36.0	38.6	46.4	48.4	51.7	12 35.92	— 0.06	. .	— 4.02	21 12 31.84	— 1.53
	15	β Aquarii. . . .	Sk.	54.1	56.7	58.2	4.3	6.3	8.5	14.6	16.2	18.6	25 6.39	— 1.01	— 4.05	— 4.03	21 25 1.35	+ 0.05
	16	Saturn I, S. . .	Sk.	36.3	38.8	40.6	. .	. .	. .	57.4	58.0	1.9	29 48.98	— 1.20	. .	— 4.03	21 29 43.75	. .
	17	Saturn II, N. . .	Sk.	. .	. .	45.9	48.0	50.2	52.3	54.5	. .	. .	29 50.18	— 1.20	. .	— 4.03	21 29 44.95	. .
	18	Moon I, S. . .	Sk.	51.0	54.0	55.7	2.3	4.5	6.7	13.0	15.0	17.5	37 4.41	— 1.26	. .	— 4.04	21 36 59.11	+66.74
	19	79 Draconis . . .	Sk.	37.4	47.0	52.0	12.8	20.0	27.1	48.1	53.3	1.8	51 19.94	+ 2.53	. .	— 4.04	21 51 18.43	+ 0.02
	20	α Aquarii. . . .	Sk.	17.5	20.0	21.4	27.6	29.6	31.7	37.7	39.1	41.7	59 29.59	— 0.92	— 4.13	— 4.04	21 59 24.63	+ 0.12
	21	B. A. C. 7701 . .	Sk.	59.7	2.9	4.6	11.9	14.3	16.8	24.2	26.0	29.2	1 14.40	— 1.59	. .	— 4.04	22 1 8.77	— 3.48
	22	π Aquarii (R.) . .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	23	π Aquarii . . .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	24	ζ Pegasi (R) . .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	25	ζ Pegasi	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	26	B. A. C. 8348 . .	Sk.	25.0	28.3	30.0	37.9	40.6	43.0	50.8	52.9	56.2	55 40.52	— 1.70	. .	— 4.09	23 55 34.73	— 4.01
	27	B. A. C. 8357 . .	Sk.	. .	6.4	8.7	11.2	13.7	16.6	21.6	23.4	26.7	57 11.33	— 1.68	. .	— 4.09	23 57 5.56	— 3.98
	28	α Cassiopeæ (R.) .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	29	α Cassiopeæ . .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	30	ε Piscium . . .	Sk.	23.5	26.0	27.6	33.6	35.7	37.8	44.0	45.6	48.2	56 35.78	— 0.77	— 4.09	— 4.08	0 56 30.93	+ 0.02
	31	Polaris. . . .	Sk.	. .	. .	5.5	32.0	59.5	28.0	57.0	. .	. .	13 0.40	+43.48	. .	— 4.09	1 13 39.79	— 1.04
	32	Neptune . . .	Sk.	. .	. .	. .	. .	. .	. .	22.9	24.4	27.0	59 14.56	— 0.72	. .	— 4.14	1 59 9.70	. .
	33	γ Ceti.	Sk.	46.1	48.6	50.2	54.2	56.2	58.1	. .	7.8	10.3	36 58.23	— 0.85	— 4.18	— 4.11	2 36 53.27	+ 0.07
8	34	79 Draconis . . .	F.	. .	. .	. .	. .	27.7	34.7	48.9	54.0	2.9	51 20.63	+ 2.51	. .	— 4.86	21 51 18.28	+ 0.01
	35	α Aquarii. . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	36	B. A. C. 7701 . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	37	π Aquarii. . . .	F.	. .	. .	. .	. .	4.5	6.5	10.4	11.8	14.5	19 2.28	— 0.96	— 4.95	— 4.87	22 18 56.45	+ 0.10
	38	η Aquarii (R.) . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	39	η Aquarii. . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	40	ζ Pegasi	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	41	λ Aquarii (R.) . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	42	λ Aquarii. . . .	F.	. .	. .	. .	. .	. .	. .	23.0	24.5	27.0	46 14.69	— 1.12	— 4.94	— 4.88	22 46 8.69	+ 0.14
	43	α Piscis Australis .	F.	40.5	43.2	44.9	52.0	54.5	56.7	4.0	5.7	8.6	50 54.46	— 1.58	— 4.87	— 4.88	22 50 48.00	+ 0.03
	44	α Pegasi	F.	27.9	30.5	32.0	38.4	40.4	42.6	48.9	50.4	53.1	58 40.47	— 0.71	— 4.82	— 4.88	22 58 34.88	— 0.03
	45	B. A. C. 8102 . .	F.	18.9	21.6	23.0	29.4	31.5	33.6	39.7	41.0	43.8	10 31.39	— 1.13	. .	— 4.88	23 10 25.38	— 3.19
	46	Moon I, S. . .	F.	45.4	48.0	49.6	55.9	58.0	0.1	6.4	8.0	10.6	16 58.00	— 1.11	. .	— 4.88	23 16 52.01	+65.91
	47	λ Draconis, S. P. .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	γ Cephei (R.). . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	49	γ Cephei	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	50	ω Piscium . . .	F.	. .	. .	. .	. .	. .	. .	10.8	12.4	14.9	53 2.60	— 0.86	— 4.92	— 4.89	23 52 56.85	+ 0.04

3, 18, 34. Bisections at sets B and D.
18. Wire A used.
19. Bisections at set C.
24, 27. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	38 48	10 4.3	1.4	14.2	7.5	36	. .	450	. .	540	. .	30.0	38 51 18.6	36.0	+ 48.5	89 58 28.3	− 0.5
2	359 50	2.2	1.0	14.2	7.3	32	. .	620	. .	660	. .	30.0	359 54 18.5	. .	− 0.1	51 0 39.6	− 1.6
3	307 30	1.5	28.4	11.1	7.7	34	. .	. .	. .	200	110	30.0	307 33 54.3	. .	− 1 17.8	358 38 57.7	− 3.3
4	49 18	0.0	27.1	9.2	2.7	29	. .	640	. .	690	. .	30.0	49 23 7.7	. .	+ 1 9.6	100 30 38.5	− 0.6
5	19 48	9 28.5	29.2	12.6	4.4	33	. .	. .	. .	752	730	30.0	19 52 4.4	. .	+ 21.5	70 58 47.1	+ 3.6
6	48 38	10 0.5	27.9	11.1	4.0	32	. .	890	. .	030	. .	30.0	48 42 16.1	. .	+ 1 7.7	99 49 45.0	. .
7	54 34	9 27.3	24.0	6.3	0.7	36	112	110	. .	. .	. .	30.0	54 37 31.7	46.5	+ 1 23.0	105 45 15.9	. .
8	55 6	27.8	24.4	6.8	1.7	34	. .	. .	. .	810	830	30.0	55 9 49.9	. .	+ 1 24.7	106 17 35.8	. .
9	11 42	10 0.6	29.0	11.5	5.4	36	. .	. .	. .	260	290	30.0	11 45 25.3	. .	+ 12.3	62 51 58.8	+ 0.7
10	32 0	1.5	28.2	10.5	4.7	34	. .	. .	. .	018	030	30.0	32 3 59.9	. .	+ 37.0	83 10 58.1	+ 1.9
11	58 36	1.9	26.8	8.4	4.5	34	. .	482	. .	570	. .	31.3	58 39 53.9	. .	+ 1 37.2	109 47 52.3	. .
12	58 36	1.9	26.8	8.4	4.5	35	320	. .	. .	. .	396	31.3	58 39 41.0	43.6	+ 1 37.1	109 47 39.3	. .
13	9 6	2.0	0.2	10.5	6.0	33	. .	020	. .	000	. .	31.3	9 10 15.7	. .	+ 9.6	60 16 46.5	+ 1.5
14	359 58	9 29.0	26.6	8.1	1.3	38	208	212	. .	. .	. .	31.3	0 0 59.4	. .	0.0	51 7 20.6	+22.5
15	44 56	29.1	25.4	7.5	1.5	35	. .	424	. .	470	. .	31.3	44 59 41.9	. .	+ 59.4	96 7 2.5	+ 2.2
16	55 4	10 1.0	27.9	8.5	3.0	34	. .	160	. .	204	. .	31.3	55 7 59.5	. .	+ 1 25.2	106 15 45.9	. .
17	55 4	1.0	27.9	8.5	3.0	35	378	. .	. .	. .	360	31.3	55 7 41.2	. .	+ 1 25.2	106 15 27.6	. .
18	57 58	0.2	25.0	6.5	1.5	36	380	. .	660	. .	840	31.3	58 3 56.8	. .	+ 1 35.2	109 11 53.2	. .
19	325 44	0.6	27.5	8.4	4.7	37	300	. .	. .	. .	285	31.3	325 47 11.8	. .	− 40.5	16 52 52.5	+ 0.3
20	39 44	9 28.4	25.0	6.6	1.0	33	568	630	. .	. .	. .	31.3	39 48 10.5	. .	+ 49.6	90 55 21.3	+ 1.9
21	72 22	10 3.7	28.9	8.0	5.0	32	. .	776	. .	746	. .	31.3	72 26 19.8	. .	+ 3 6.2	123 35 47.2	+ 3.5
22	141 48	9 29.8	29.7	8.5	6.0	33	856	920	. .	. .	. .	31.3	141 52 2.8	. .	− 46.8	89 15 5.2	− 0.2
23	38 4	29.7	25.8	7.0	2.0	34	. .	. .	. .	360	390	31.3	38 7 58.4	40.8	+ 46.8	89 15 6.4	+ 1.0
24	151 16	10 2.0	29.6	9.7	6.0	31	862	850	. .	. .	. .	31.3	151 18 0.1	. .	− 32.7	79 48 53.8	+ 1.1
25	28 38	9 27.0	23.5	4.0	0.3	34	. .	. .	. .	368	440	31.3	28 42 0.5	. .	+ 32.7	79 48 54.4	+ 1.7
26	76 40	10 1.7	27.5	6.2	3.7	30	. .	968	. .	080	. .	31.3	76 44 48.0	. .	+ 4 9.5	127 55 18.7	+11.2
27	75 44	9 29.5	24.6	5.0	29.6	30	. .	. .	. .	410	382	31.3	75 46 27.7	. .	+ 3 52.4	126 56 41.3	+11.6
28	196 54	10 3.5	1.3	11.5	4.0	35	280	100	. .	. .	. .	31.3	196 57 40.6	. .	+ 18.3	34 8 22.3	− 2.4
29	342 58	0.6	27.0	7.8	2.2	32	. .	. .	. .	770	780	31.3	343 2 23.0	. .	− 18.3	34 8 25.9	+ 1.2
30	31 36	9 28.4	26.5	6.8	1.2	35	. .	650	. .	668	. .	31.3	31 39 38.9	. .	+ 37.0	82 46 37.1	+ 2.2
31	310 12	10 2.2	28.8	8.8	4.7	34	910	. .	860	. .	792	31.3	310 15 48.5	37.2	− 1 10.9	1 20 58.8	0.0
32	28 36	9 26.5	24.6	6.1	29.6	36	. .	. .	. .	315	320	31.3	28 39 30.7	. .	+ 32.9	79 46 24.8	. .
33	36 6	10 0.0	25.4	6.3	0.7	34	130	130	. .	. .	. .	31.3	36 10 2.1	36.6	+ 44.0	87 17 7.3	− 0.2
34	325 44	9 26.6	23.7	5.7	1.1	37	. .	. .	. .	585	587	31.8	325 47 11.5	. .	− 40.4	16 52 52.3	+ 0.4
35	39 44	26.6	19.9	4.2	28.1	33	. .	. .	. .	970	970	31.8	39 48 9.0	43.0	+ 49.6	90 55 19.8	+ 0.3
36	72 22	25.2	20.6	1.4	3.1	33	. .	. .	. .	362	350	31.8	72 26 17.7	43.0	+ 3 6.0	123 35 44.9	+ 3.3
37	38 4	27.6	22.8	5.4	29.6	34	. .	. .	. .	604	600	31.8	38 7 57.7	. .	+ 46.8	89 15 5.7	+ 0.2
38	140 18	29.1	25.8	7.2	3.4	35	048	072	. .	. .	. .	31.8	140 21 47.5	. .	− 49.4	90 45 23.1	0.0
39	39 34	27.4	23.2	5.8	0.1	33	. .	. .	. .	528	554	31.8	39 38 13.7	. .	+ 49.4	90 45 24.3	+ 1.2
40	28 38	29.0	25.6	7.6	1.8	34	. .	. .	. .	238	246	31.8	28 42 1.1	. .	+ 32.7	79 48 55.0	+ 2.3
41	132 48	10 0.7	26.8	7.7	5.3	30	134	142	. .	. .	. .	31.8	132 53 1.7	. .	− 1 4.3	98 14 23.8	+ 0.9
42	47 4	9 25.1	21.6	2.6	27.9	38	. .	. .	. .	572	582	31.8	47 6 58.8	. .	+ 1 4.3	98 14 24.3	+ 1.4
43	69 4	27.6	22.1	3.0	29.6	34	. .	504	. .	518	. .	31.8	69 7 59.3	. .	+ 2 35.7	120 16 56.2	+ 2.1
44	24 18	24.0	21.2	3.1	26.8	39	. .	200	. .	226	. .	31.8	24 20 49.4	40.6	+ 27.1	75 27 37.7	+ 0.8
45	47 14	27.7	25.0	6.7	1.5	39	. .	132	. .	190	. .	31.8	47 16 46.1	. .	+ 1 4.7	98 24 12.0	+16.6
46	46 14	27.6	23.9	5.4	29.9	35	. .	138	448	922	. .	31.8	46 17 43.2	. .	+ 1 2.6	97 25 7.0	. .
47	288 54	29.4	25.9	7.0	2.8	36	880	908	. .	. .	. .	31.8	288 57 18.7	. .	− 2 52.9	340 0 47.2	+ 2.1
48	217 58	29.9	26.7	9.4	2.4	33	. .	. .	. .	. .	408	31.8	218 2 12.4	. .	+ 46.8	13 3 22.0	− 1.0
49	321 54	24.1	21.2	2.1	27.9	35	. .	. .	. .	370	. .	31.8	321 57 49.8	. .	− 46.8	13 3 24.2	+ 1.2
50	32 38	25.7	22.6	3.8	28.5	33	. .	. .	. .	195	198	31.8	32 42 20.5	. .	+ 38.5	83 49 20.2	+ 0.3

No.	Barom.	At. Ther.
	in.	°
1	30.17	36.2
7	30.19	45.6
12	30.15	45.8
23	30.15	43.8
31	30.14	40.6
33	30.14	40.0
35	30.20	45.6
36	30.20	45.6
44	30.22	44.2

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
6	− 8.5	− 4.3	. .	− 12.8
7	− 7.3	+ 16 9.9	. .	+ 16 2.6
8	− 7.4	− 16 9.9	. .	− 16 17.3
11	− 7.1	− 6.5	. .	− 13.6
12	− 7.1	+ 6.5	. .	− 0.6
16	− 0.8	− 9.1	. .	− 9.9
17	− 0.8	+ 9.2	. .	+ 8.4
18	−47 27.8	− 15 19.0	. .	− 1 2 46.8
32	− 0.1	. .	. .	− 0.1
46	−41 44.2	− 15 49.6	. .	− 57 33.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Nov. 8	1	Lamont 18.	F.	12.9	15.3	17.0	23.0	25.0	27.0	33.3	34.7	37.3	6 25.06	− 1.03	. .	− 4.88	0 6 19.17	− 3.34
	2	β Ceti	F.	15.9	18.5	20.1	26.6	28.7	30.9	37.4	39.0	41.9	37 28.78	− 1.32	− 4.95	− 4.90	0 37 22.56	+ 0.10
	3	ε Piscium	F.	26.8	28.3	32.4	34.6	36.6	38.7	40.8	44.9	46.4	56 36.61	− 0.84	− 4.85	− 4.91	0 56 30.86	− 0.04
	4	B. A. C. 326	F.	. .	52.3	54.8	57.5	59.7	2.3	7.0	9.0	11.9	1 57.30	− 1.66	. .	− 4.89	1 1 50.75	− 3.94
	5	B. A. C. 362	F.	24.9	28.0	29.7	36.9	39.3	41.7	48.8	50.5	53.7	6 39.28	− 1.63	. .	− 4.89	1 6 32.78	− 3.90
	6	B. A. C. 366	F.	. .	. .	. .	. .	. .	. .	. .	20.9	24.0	7 8.92	− 1.72	. .	− 4.89	1 7 2.31	− 4.00
	7	Polaris	F.	. .	. .	. .	. .	0.0	28.0	55.0	. .	. .	13 0.68	+43.71	. .	− 4.91	1 13 39.48	− 0.60
	8	θ^1 Ceti	F.	44.0	46.5	48.0	54.1	56.3	58.4	4.5	6.0	8.6	17 56.27	− 1.14	− 4.96	− 4.91	1 17 50.22	+ 0.07
	9	ο Piscium (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	10	ο Piscium	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	11	β Arietis	F.	. .	49.0	51.2	53.5	55.7	57.8	2.2	3.7	6.5	47 53.43	− 0.59	− 4.80	− 4.92	1 47 47.92	− 0.04
	12	Durch. 10°, 285	F.	8.1	10.6	12.0	18.3	20.5	22.6	28.8	30.4	33.1	58 20.49	− 0.78	. .	− 4.89	1 58 14.82	− 3.69
	13	γ Ceti	F.	46.9	49.5	51.0	57.0	59.1	1.1	7.2	8.7	11.3	36 59.09	− 0.92	− 4.95	− 4.93	2 36 53.24	+ 0.02
	14	Ianthe	F.	42.1	45.4	47.3	. .	. .	. .	7.8	10.5	13.0	52 57.68	− 0.16	. .	− 4.89	2 52 52.63	. .
	15	Ate	F.	31.8	34.9	36.7	43.0	45.5	47.8	54.6	56.5	59.0	0 45.53	− 0.46	. .	− 4.89	3 0 40.18	. .
	16	ζ Arietis	F.	39.6	42.3	43.9	50.4	52.7	54.8	1.3	2.9	5.7	7 52.62	− 0.58	− 4.97	− 4.94	3 7 47.10	− 0.01
	17	α Persei	F.	15.3	19.0	21.5	30.8	34.0	37.1	46.5	48.7	52.8	15 33.97	+ 0.25	. .	− 4.94	3 15 29.28	0.00
	18	Clotho	F.	52.0	54.6	56.2	2.1	4.4	6.5	12.5	14.0	16.4	25 4.30	− 1.03	. .	− 4.90	3 24 58.37	. .
	19	Egeria	F.	42.8	45.6	47.0	54.0	56.2	58.5	5.0	6.7	9.6	30 56.16	− 0.52	. .	− 4.90	3 30 50.74	. .
	20	η Tauri	F.	59.4	2.3	4.0	10.6	12.9	15.2	21.8	23.4	26.2	40 12.87	− 0.52	− 4.90	− 4.95	3 40 7.40	− 0.05
	21	Pomona	F.	27.5	30.0	31.6	38.0	40.2	42.3	48.7	50.2	53.0	44 40.17	− 0.64	. .	− 4.90	3 44 34.63	. .
	22	ζ Persei	F.	. .	. .	. .	. .	. .	30.9	35.7	37.5	40.4	46 26.18	− 0.33	− 4.91	− 4.95	3 46 20.90	− 0.05
	23	B. A. C. 1221	F.	25.4	28.0	29.6	36.3	38.5	40.8	47.4	49.0	51.8	49 38.53	− 0.55	. .	− 4.90	3 49 33.08	− 4.06
	24	γ^1 Eridani	F.	9.2	11.6	13.3	19.5	21.6	23.8	30.0	31.6	34.2	52 21.64	− 1.23	− 4.88	− 4.95	3 52 15.46	− 0.03
	25	B. A. C. 1342	F	58.2	0.8	2.5	9.0	11.2	13.4	19.9	21.5	24.3	15 11.20	− 0.58	. .	− 4.90	4 15 5.72	− 4.04
	26	B. A. C. 1361	F.	36.7	39.5	41.0	47.5	49.7	52.0	58.4	59.9	2.6	17 49.70	− 0.62	. .	− 4.90	4 17 44.18	− 3.98
	27	B. A. C. 1370	F.	. .	. .	. .	. .	. .	. .	50.9	52.3	55.0	19.42.31	− 0.71	. .	− 4.90	4 19 36.70	− 3.92
	28	B. A. C. 4211	P.	18.7	21.3	23.0	29.3	31.3	33.6	40.0	41.5	44.2	23 31.43	− 1.12	. .	− 5.02	12 23 25.29	− 1.31
	29	κ Draconis,	P.	35.6	43.2	47.8	6.1	12.3	18.5	36.6	41.4	49.0	28 12.28	+ 1.85	. .	− 5.02	12 28 9.11	− 0.03
	30	B. A. C. 4340	P.	13.5	15.9	17.5	. .	23.6	25.7	27.7	29.9	. .	49 25.70	− 0.77	. .	− 5.02	12 49 19.91	− 1.41
	31	12 Canum Venat.	P.	. .	12.0	14.6	17.0	19.7	22.4	27.6	29.5	32.9	50 17.18	− 0.07	− 5.07	− 5.02	12 50 12.09	+ 0.05
	32	B. A. C. 4367	P.	51.8	54.5	56.0	2.3	4.4	6.4	12.7	14.2	16.9	56 4.36	− 0.65	. .	− 5.02	12 55 58.69	− 1.41
	33	Polaris, S. P.	P.	. .	20.0	55.0	25.0	59.0	33.5	37.5	33.0	43.0	14 25.72	−41.53	. .	− 5.02	1 13 39.17	− 0.74
	34	α Virginis	P.	31.5	33.9	. .	. .	. .	. .	. .	. .	. .	18 43.82	− 1.02	− 4.98	− 5.02	13 18 37.78	− 0.06
	35	η Ursæ Majoris.	P.	23.3	27.3	29.6	39.0	42.1	45.4	54.8	57.3	1.4	42 42.24	+ 0.29	. .	− 5.03	13 42 37.50	− 0.02
	36	η Bootis	P.	. .	46.3	48.5	50.6	52.9	55.0	59.3	0.9	3.7	48 50.67	− 0.51	− 5.02	− 5.03	13 48 45.13	− 0.06
	37	α Draconis	P.	34.7	40.7	44.4	58.9	3.6	8.5	22.8	26.4	32.6	1 3.62	+ 1.20	. .	− 5.03	14 0 59.69	− 0.16
	38	α Bootis	P.	51.0	54.0	55.5	2.2	4.3	6.4	12.8	14.6	17.2	10 4.22	− 0.50	− 5.09	− 5.03	14 9 58.69	+ 0.06
	39	5 Ursæ Minoris.	P.	55.6	6.3	12.6	38.3	46.8	55.5	21.2	27.2	38.4	27 46.88	+ 3.08	. .	− 5.03	14 27 44.93	− 0.27
	40	β Ursæ Minoris.	P.	17.6	27.1	32.9	55.9	3.1	11.0	34.3	40.4	49.4	51 3.52	+ 2.64	. .	− 5.03	14 51 1.13	− 0.76
9	41	Sun I, N.	P.	31.3	33.9	35.5	41.9	44.1	46.3	52.6	54.3	56.9	56 44.09	− 1.12	. .	− 5.01	14 56 37.96	. .
	42	Sun II, S.	P.	46.9	49.5	51.0	57.6	59.6	1.8	8.1	9.8	12.4	58 59.63	− 1.13	. .	− 5.01	14 58 53.49	. .
	43	γ^2 Ursæ Minoris.	P.	15.7	23.9	28.6	48.7	55.4	2.4	22.4	27.2	35.8	20 55.57	+ 2.14	. .	− 5.04	15 20 52.67	+ 0.38
	44	α Coronæ Borealis	P.	. .	. .	25.2	27.5	29.8	32.0	34.4	. .	. .	29 29.78	− 0.36	− 4.94	− 5.04	15 29 24.38	− 0.10
	45	α Serpentis	P.	. .	9.5	11.5	13.6	15.7	. .	21.8	23.4	25.9	38 13.59	− 0.73	− 5.08	− 5.04	15 38 7.82	+ 0.06
	46	Venus I, N.	P.	28.9	31.7	33.4	. .	. .	. .	50.8	52.3	55.2	47 42.05	− 1.18	. .	− 5.01	15 47 35.86	+ 0.36
	47	Venus S.	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
10	48	B. A. C. 8348	Sk.	25.8	29.3	31.2	38.7	41.4	44.1	51.6	53.6	56.7	55 41.38	− 2.01	. .	− 4.90	23 55 34.47	− 3.97
	49	B. A. C. 8357	Sk.	57.0	59.9	1.7	9.8	12.4	14.8	22.3	24.3	27.5	57 12.19	− 1.96	. .	− 4.90	23 57 5.33	+ 3.94

14, 15, 18, 19, 21. Wire A used.
27, 49. Wire B used.
29, 37, 39, 40, 43. Bisections at sets B and D.
31. Bisections at wires V and VI.
35. Bisections at wires I–III.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	40 44	9 25.6	21.5	4.3	28.8	35	. .	364	. .	368	. .	31.8	40 47 46.9	. .	+ 51.7	91 54 59.8	+21.3
2	57 28	25.4	21.7	4.0	29.7	33	. .	864	. .	884	. .	31.8	57 32 9.5	. .	+ 1 34.0	108 40 4.7	+ 0.7
3	31 36	25.0	20.7	3.6	27.6	36	. .	. .	. .	054	072	31.8	31 39 37.5	. .	+ 37.0	82 46 35.7	+ 0.8
4	72 16	26.7	21.2	3.7	0.0	37	. .	. .	. .	828	838	31.8	72 19 8.8	. .	+ 3 6.1	123 28 36.1	+16.4
5	70 14	26.6	21.7	3.9	0.2	32	656	684	. .	. .	. .	31.8	70 18 27.0	. .	+ 2 46.2	121 27 34.4	+17.1
6	74 38	29.3	23.7	4.7	29.8	34	. .	. .	. .	708	722	31.8	74 41 55.0	. .	+ 3 36.1	125 51 52.3	+16.2
7	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
8	47 38	27.0	22.9	3.9	28.9	34	. .	752	. .	762	. .	31.8	47 41 55.6	. .	+ 1 5.9	98 49 22.7	+ 1.6
9	149 34	25.9	23.4	4.4	1.5	30	382	392	. .	. .	. .	31.8	149 39 1.5	. .	− 35.1	81 27 54.8	+ 0.2
10	30 18	28.6	25.0	6.0	1.0	38	. .	. .	. .	452	462	31.8	30 20 57.4	39.2	+ 35.1	81 27 53.7	− 0.9
11	18 38	28.9	26.8	8.7	2.2	37	. .	. .	. .	736	742	31.8	18 41 7.0	. .	+ 20.3	69 47 48.5	+ 1.6
12	28 36	25.7	23.7	4.9	29.1	32	. .	896	. .	900	. .	31.8	28 40 24.0	38.8	+ 32.9	79 47 18.1	+25.0
13	36 6	27.6	24.7	6.2	0.8	34	. .	122	. .	132	. .	31.8	36 10 3.7	. .	+ 44.0	87 17 8.9	+ 1.3
14	0 52	26.3	24.8	6.7	1.2	31	. .	. .	. .	440	440	31.8	0 59 18.5	. .	+ 1.0	52 5 40.7	− 0.1
15	13 14	10 1.1	28.1	10.6	4.6	36	. .	. .	. .	099	072	31.8	13 20 3.4	. .	+ 14.3	64 26 38.9	− 1.4
16	18 14	9 24.6	23.0	5.0	29.0	33	. .	900	. .	914	. .	31.8	18 18 9.1	. .	+ 19.9	69 24 50.2	+ 1.3
17	349 24	23.7	21.9	2.7	27.7	32	. .	240	. .	240	. .	31.8	349 28 36.3	. .	− 11.2	40 34 46.3	− 1.8
18	41 52	29.4	25.2	7.9	1.7	38	. .	. .	. .	990	998	31.8	41 57 21.0	. .	+ 54.2	93 4 36.4	− 5.6
19	15 14	28.0	25.7	7.3	1.5	39	. .	. .	. .	882	890	31.8	15 19 8.1	. .	+ 16.5	66 25 45.8	− 1.5
20	15 6	10 0.5	27.5	9.6	3.6	34	104	116	. .	. .	. .	31.8	15 10 0.9	36.6	+ 16.4	66 16 38.5	+ 0.3
21	20 56	0.7	29.4	9.8	2.2	33	. .	394	. .	394	. .	31.8	21 2 44.7	. .	+ 23.3	72 9 29.2	− 1.8
22	7 18	9 28.6	26.9	8.3	2.7	32	. .	. .	. .	120	158	31.8	7 22 33.0	. .	+ 7.8	58 29 2.0	− 0.5
23	16 42	28.4	26.5	7.9	0.8	34	. .	. .	. .	192	210	31.8	16 46 2.0	. .	+ 18.2	67 52 41.4	+20.3
24	52 40	29.6	25.8	8.1	2.0	34	. .	. .	. .	740	744	31.8	52 43 52.9	. .	+ 1 19.3	103 51 33.4	+ 1.0
25	18 18	27.1	25.6	7.0	1.0	36	082	106	. .	. .	. .	31.8	18 21 33.1	. .	+ 20.1	69 28 14.4	+18.6
26	20 4	24.1	22.0	4.0	27.4	35	372	374	. .	. .	. .	31.8	20 7 47.4	. .	+ 22.2	71 14 30.8	+18.8
27	24 28	26.4	23.8	5.3	29.7	43	. .	. .	. .	564	562	31.8	24 27 8.0	35.0	+ 27.6	75 33 56.8	+19.0
28	54 38	28.0	25.2	7.6	1.6	36	. .	210	. .	170	. .	32.6	54 41 32.1	38.0	+ 1 25.1	105 49 18.4	− 7.7
29	328 22	25.3	23.8	5.3	1.3	34	165	. .	140	. .	162	32.6	328 26 5.1	. .	− 37.0	19 31 49.3	− 0.7
30	34 44	27.2	23.4	5.9	1.1	32	. .	. .	. .	415	. .	32.3	34 48 30.9	. .	+ 41.8	85 55 33.9	−12.8
31	359 50	10 1.0	29.7	10.5	4.5	32	. .	. .	. .	695	700	32.3	359 54 22.4	. .	− 0.1	51 0 43.5	+ 1.3
32	27 12	9 28.8	25.6	7.4	2.2	36	355	340	. .	. .	. .	32.3	27 15 28.8	40.2	+ 30.9	78 22 20.9	−14.5
33	307 30	26.8	25.3	5.9	2.5	34	415	438	485	438	440	32.1	307 33 58.7	. .	− 1 18.3	358 39 1.6	− 0.4
34	49 18	29.4	26.9	8.7	3.1	29	. .	. .	. .	. .	745	32.0	49 23 8.7	41.0	+ 1 9.9	100 30 39.8	+ 0.4
35	348 54	27.7	24.5	5.5	2.0	34	675	640	600	. .	. .	31.8	348 57 56.0	. .	− 11.7	40 4 5.5	+ 0.8
36	19 48	27.9	26.3	8.7	2.3	34	. .	. .	. .	150	080	31.7	19 52 2.9	. .	+ 21.6	70 58 45.7	+ 1.5
37	333 52	24.3	23.0	5.5	0.0	34	180	. .	210	. .	215	31.6	333 56 4.1	. .	− 29.2	25 1 56.1	− 2.1
38	19 0	26.0	24.5	6.8	0.6	36	145	125	. .	. .	120	31.5	19 3 33.2	43.7	+ 20.6	70 10 15.0	+ 2.5
39	322 36	26.8	24.3	6.9	3.1	35	575	. .	595	. .	615	31.3	322 39 40.5	. .	− 45.3	13 45 16.4	− 0.2
40	324 10	25.0	22.1	5.1	2.4	31	. .	700	675	650	. .	31.1	324 14 40.4	. .	− 42.7	15 20 18.9	− 2.4
41	55 26	28.5	25.3	7.7	2.3	33	595	545	. .	. .	. .	31.0	55 30 10.2	. .	+ 1 26.1	106 37 57.5	. .
42	55 58	25.7	22.5	5.3	0.3	32	. .	. .	. .	395	435	31.0	56 2 30.3	46.4	+ 1 27.8	107 10 19.3	. .
43	326 34	17.0	15.3	27.6	23.8	35	525	. .	545	. .	535	30.8	326 37 50.2	. .	− 39.0	17 43 32.4	+ 1.4
44	11 42	27.0	24.5	7.1	1.3	36	. .	570	. .	530	. .	30.7	11 45 25.5	47.6	+ 12.3	62 51 59.0	+ 0.1
45	32 0	26.2	23.4	5.0	29.7	34	. .	. .	. .	435	380	30.6	32 3 59.8	. .	+ 37.0	83 10 58.0	+ 1.3
46	58 48	10 2.4	28.8	11.3	5.0	37	470	. .	. .	. .	400	30.5	58 51 6.9	. .	+ 1 37.4	109 59 5.5	. .
47	58 48	2.4	28.8	11.3	5.0	36	. .	815	. .	805	. .	30.5	58 51 16.6	48.4	+ 1 37.4	109 59 15.2	. .
48	76 40	1.5	26.5	6.6	3.2	30	722	832	. .	. .	. .	32.3	76 44 52.6	. .	+ 4 3.2	127 55 17.0	+10.6
49	75 44	9 28.6	24.6	3.6	1.1	30	. .	138	. .	142	. .	32.3	75 46 32.5	. .	+ 3 46.6	126 56 40.3	+11.0

No.	Barom.	At. Ther.
	in.	°
10	30.23	41.5
12	30.23	41.6
20	30.24	40.5
27	30.24	39.5
28	30.31	38.0
32	30.31	40.3
34	30.32	41.2
38	30.31	42.9
42	30.29	45.4
44	30.28	46.6
47	30.285	47.8

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
41	− 7.4	+ 16 10.9	. .	+ 16 3.5
42	− 7.4	− 16 10.9	. .	− 16 18.3
46	− 4.5	+ 4.9	. .	+ 0.4
47	− 4.5	− 4.9	+ 0.1	− 9.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Nov. 10	1	B. A. C. 5	Sk.	16.0	18.6	20.1	26.1	28.2	30.3	36.5	38.0	40.5	2 28.26	− 1.16	. .	− 4.90	0 2 22.20	− 3.33
	2	γ Pegasi	Sk.	44.4	47.0	48.5	54.8	56.8	59.0	5.4	6.9	9.6	6 56.93	− 0.79	− 4.94	− 4.92	0 6 51.24	+ 0.02
	3	α Cassiopeæ (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	4	α Cassiopeæ	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	5	32¹ Camelopard., S. P.	Sk.	17.2	53.4	37.6	. .	. .	. .	58.9	45.3	19.2	48 18.62	−12.62	. .	− 4.91	12 48 1.09	+ 3.96
	6	32² Camelopard., S. P.	Sk.	. .	. .	6.8	46.8	26.4	6.6	44.9	. .	. .	48 26.30	−12.62	. .	− 4.92	12 48 8.76	− 1.03
	7	ε Piscium	Sk.	. .	32.6	34.7	36.7	38.9	40.9	45.0	46.5	49.1	56 36.76	− 0.94	− 4.91	− 4.93	0 56 30.89	0.00
	8	Polaris	Sk.	. .	. .	0.0	25.5	54.5	23.0	50.5	. .	. .	12 54.70	+49.35	. .	− 4.93	1 13 39.12	− 0.34
	9	Weisse 767	Sk.	11.2	13.7	15.3	21.5	23.5	25.6	31.8	33.4	36.2	44 23.58	− 0.88	. .	− 4.92	1 44 17.78	− 3.65
	10	β Arietis	Sk.	40.5	43.3	44.9	51.4	53.4	55.6	2.3	3.9	6.6	47 53.54	− 0.66	− 4.90	− 4.93	1 47 47.95	− 0.01
	11	Neptune	Sk.	38.5	41.0	42.5	48.8	50.9	52.9	59.0	0.6	3.4	58 50.84	− 0.89	. .	− 4.93	1 58 45.02	. .
	12	α Arietis	Sk.	. .	12.8	14.9	17.1	19.4	21.5	26.0	27.6	30.4	0 17.12	− 0.60	− 4.98	− 4.93	2 0 11.59	− 0.01
	13	5 Ursæ Minoris, S. P.	Sk.	36.7	30.4	13.0	4.7	56.1	47.8	38.4	21.3	15.3	27 55.97	− 5.95	. .	− 4.94	14 27 45.08	− 0.12
	14	γ Ceti	Sk.	47.0	49.5	51.0	57.1	59.1	1.3	7.5	8.9	11.5	36 59.21	− 1.04	− 4.93	− 4.94	2 36 53.23	− 0.01
	15	B. A. C. 855	Sk.	1.9	5.0	6.8	14.0	16.4	19.0	26.3	28.0	31.1	39 16.50	− 1.86	. .	− 4.93	2 39 9.71	− 3.85
	16	B. A. C. 886	Sk.	7.0	10.2	12.1	17.0	19.6	22.1	24.7	27.4	. .	45 22.18	− 1.96	. .	− 4.93	2 45 15.29	− 3.88
	17	B. A. C. 910	Sk.	16.9	19.5	20.9	27.3	29.3	31.4	37.4	39.0	41.7	50 29.27	− 1.29	. .	− 4.93	2 50 23.05	− 3.73
	18	α Ceti	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	19	B. A. C. 997	Sk.	42.0	45.0	46.6	53.9	56.1	58.5	5.4	7.2	10.2	6 56.13	− 1.76	. .	− 4.94	3 6 49.43	− 3.75
	20	B. A. C. 1005	Sk.	21.3	24.4	26.1	33.3	35.6	37.9	45.0	46.7	49.7	8 35.56	− 1.78	. .	− 4.94	3 8 28.84	− 3.75
	21	B. A. C. 1060	Sk.	39.3	42.4	44.2	51.6	53.9	56.5	3.8	5.6	8.8	18 54.01	− 1.86	. .	− 4.94	3 18 47.21	− 3.74
	22	B. A. C. 1074	Sk.	1.4	4.7	6.5	14.0	16.6	19.1	26.7	28.7	31.9	21 16.62	− 1.96	. .	− 4.94	3 21 9.72	− 3.76
	23	B. A. C. 1121	Sk.	59.1	2.1	3.8	10.9	13.0	15.7	22.6	24.3	27.4	32 13.21	− 1.78	. .	− 4.94	3 32 6.49	− 3.69
	24	B. A. C. 1136²	Sk.	. .	. .	. .	25.3	28.0	30.8	33.4	. .	. .	35 28.03	− 2.10	. .	− 4.94	3 35 20.99	− 3.75
	25	η Tauri	Sk.	. .	. .	. .	. .	. .	17.5	22.0	23.7	26.6	40 13.10	− 0.58	− 5.04	− 4.95	3 40 7.57	+ 0.09
	26	ζ Persei	Sk.	11.9	14.9	16.6	23.9	26.3	28.6	35.8	37.7	40.6	46 26.26	− 0.37	− 4.91	− 4.95	3 46 20.94	− 0.05
	27	B. A. C. 1216¹	Sk.	. .	. .	. .	. .	. .	. .	18.7	20.3	22.9	48 10.57	− 1.17	. .	− 4.94	3 48 4.46	− 3.73
	28	B. A. C. 1216²	Sk.	. .	. .	6.8	8.6	10.7	12.7	14.8	. .	. .	48 10.72	− 1.17	. .	− 4.94	3 48 4.61	− 3.73
	29	ε Tauri	Sk.	15.9	18.6	20.3	24.5	26.7	28.8	30.9	33.1	. .	21 28.84	− 0.69	− 4.98	− 4.95	4 21 23.20	+ 0.02
	30	α Tauri	Sk.	42.0	44.6	46.0	52.4	54.6	56.8	3.0	4.6	7.3	28 54.59	− 0.75	− 4.89	− 4.95	4 28 48.89	− 0.08
	31	B. A. C. 1440	Sk.	9.3	12.3	14.0	21.0	23.5	25.9	33.0	34.8	37.9	32 23.52	− 1.79	. .	− 4.95	4 32 16.78	− 3.46
	32	B. A. C. 1467	Sk.	15.3	18.3	19.9	27.0	29.5	31.8	39.1	40.8	43.8	38 29.50	− 1.80	. .	− 4.95	4 38 22.75	− 3.43
	33	ι Aurigæ	Sk.	46.5	49.6	51.3	58.6	1.0	3.5	10.7	12.6	15.5	49 1.03	− 0.33	− 4.98	− 4.95	4 48 55.75	− 0.01
	34	12 Canum Venat.	E.	1.8	5.0	7.1	14.9	17.5	20.1	28.0	30.1	33.4	50 17.54	− 0.11	− 5.34	− 5.32	12 50 12.11	+ 0.02
	35	B. A. C. 4367	E.	52.4	54.9	56.6	2.8	4.8	6.9	13.0	14.7	17.4	56 4.83	− 0.73	. .	− 5.39	12 55 58.71	− 1.46
	36	Polaris, S. P.	P.	6.0	18.0	13.5	. .	. .	. .	43.0	35.5	46.0	14 27.03	−45.12	. .	− 5.18	1 13 36.73	− 2.59
	37	Polaris, S. P.	E.	. .	. .	24.5	58.0	30.0	1.5	34.5	. .	. .	14 29.66	−45.12	. .	− 5.33	1 13 39.21	− 0.11
	38	α Virginis	E.	34.5	36.0	40.1	42.2	44.3	46.4	48.5	52.6	54.2	18 44.31	− 1.12	− 5.33	− 5.33	13 18 37.86	− 0.02
	39	ζ Virginis	E.	15.0	17.5	19.0	25.0	27.1	29.1	35.6	37.0	39.5	28 27.20	− 0.93	− 5.48	− 5.33	13 28 20.94	+ 0.15
	40	η Ursæ Majoris	E.	23.8	27.7	30.0	39.5	42.7	45.9	55.4	57.7	1.9	42 42.73	+ 0.28	. .	− 5.33	13 42 37.68	+ 0.12
	41	η Bootis	E.	38.1	40.8	42.5	49.0	51.1	53.2	59.7	1.4	4.1	48 51.10	− 0.59	− 5.34	− 5.33	13 48 45.18	− 0.04
	42	Mercury II, S.	E.	7.9	10.6	12.1	18.2	20.4	22.5	28.6	30.1	32.7	56 20.34	− 1.10	. .	− 5.38	13 56 13.86	− 0.26
	43	α Draconis	E.	35.6	41.2	44.9	59.3	4.1	9.0	23.5	27.0	33.1	1 4.19	+ 1.27	. .	− 5.33	14 0 0.13	+ 0.26
	44	α Bootis	E.	51.6	54.4	56.1	2.5	4.7	6.9	13.4	15.0	17.7	10 4.70	− 0.57	− 5.45	− 5.34	14 9 58.79	+ 0.13
11	45	Sun I, S.	E.	36.7	39.4	41.0	47.4	49.6	51.8	58.2	59.8	2.5	4 49.60	− 1.24	. .	− 5.37	15 4 42.99	. .
	46	Sun II, N.	E.	53.0	55.7	57.1	3.6	5.8	8.0	14.5	16.0	18.7	7 5.82	− 1.24	. .	− 5.37	15 6 59.21	. .
	47	Venus I, S.	E.	51.6	54.3	56.0	2.6	4.7	7.0	13.5	15.0	17.8	58 4.72	− 1.31	. .	− 5.37	15 57 58.04	+ 0.37
	48	Venus, N.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	49	δ Ophiuchi	E.	43.0	45.7	47.2	53.5	55.4	57.4	3.6	5.1	7.7	7 55.40	− 1.00	− 5.42	− 5.35	16 7 49.05	+ 0.09
	50	B. A. C. 5437	E.	38.0	40.5	41.9	48.1	50.1	52.2	58.4	59.9	2.5	11 50.18	− 1.01	. .	− 5.37	16 11 43.80	− 1.22

5, 11, 26, 36. Bisections at sets B and D.
6, 13, 43. Bisections at set C.
21. Wire A used.
38, 49. Telescope micrometer reading decreased five revolutions in reduction.

Number.	Circle Division	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
2	24 20	10 4.2	1.2	12.2	5.8	35	. .	950	. .	990	. .	32.3	24 23 30.1	41.4	+ 26.5	75 30 17.8	+ 2.5
3	196 54	2.3	29.8	9.3	3.0	35	260	300	. .	. .	. .	32.3	196 57 41.7	. .	+ 17.8	34 8 21.7	— 2.1
4	342 58	1.8	28.7	8.3	3.0	32	. .	. .	. .	760	800	32.3	343 2 22.8	. .	- 17.8	34 8 26.2	+ 2.4
5	302 56	9 29.7	26.5	6.5	3.0	32	154	. .	. .	. .	134	32.3	303 0 32.2	. .	— 1 29.9	354 5 23.5	+29.3
6	302 56	29.7	26.5	6.5	3.0	33	424	. .	. .	. .	358	32.3	303 0 13.8	. .	— 1 29.9	354 5 5.1	+ 3.4
7	31 36	27.5	25.6	6.0	0.5	35	. .	. .	. .	770	764	32.3	31 39 39.4	. .	+ 36.1	82 46 36.7	+ 1.7
8	310 12	10 2.7	0.5	9.0	5.8	35	042	. .	940	. .	976	32.3	310 15 46.6	. .	— 1 9.1	1 20 58.7	+ 1.2
9	28 24	1.6	28.8	9.3	3.8	36	830	860	. .	. .	. .	32.3	28 27 18.8	. .	+ 31.8	79 34 11.8	+25.2
10	18 38	9 29.5	28.8	8.3	2.6	37	. .	614	. .	654	. .	32.3	18 41 8.2	. .	+ 19.8	69 47 49.2	+ 2.4
11	28 38	29.3	26.5	6.8	1.7	35	412	. .	. .	. .	440	32.3	28 41 43.1	. .	+ 32.1	79 48 36.4	. .
12	15 58	28.5	26.7	8.2	1.7	39	. .	. .	. .	310	316	32.3	16 0 43.9	. .	+ 16.8	67 7 21.9	+ 1.8
13	295 6	10 1.4	27.8	8.0	4.0	32	374	. .	. .	. .	380	32.3	295 10 28.0	. .	— 2 4.3	346 14 44.9	+ 2.0
14	36 6	9 29.3	25.6	6.7	1.3	34	000	054	. .	. .	. .	32.3	36 10 4.6	. .	+ 42.9	87 17 8.7	+ 1.0
15	71 50	10 0.9	26.5	6.5	3.2	35	. .	978	. .	062	. .	32.3	71 53 33.1	. .	+ 2 57.4	123 2 51.7	+20.6
16	75 8	0.0	25.5	5.0	2.0	36	. .	620	. .	810	. .	32.3	75 11 23.6	. .	+ 3 38.5	126 21 23.3	+20.4
17	48 12	3.0	28.3	8.9	2.8	34	. .	082	. .	170	. .	32.3	48 16 0.8	. .	+ 1 5.8	99 23 27.8	+22.8
18	35 12	9 29.1	25.6	7.9	0.0	31	616	. .	. .	622	. .	32.3	35 16 41.8	. .	+ 41.6	86 23 44.6	+ 0.8
19	68 16	10 1.7	27.8	7.9	4.0	35	486	310	. .	. .	. .	32.3	68 19 41.1	. .	+ 2 26.8	119 28 29.1	+21.5
20	69 4	1.5	27.3	7.6	4.0	37	. .	. .	. .	902	902	32.3	69 7 3.7	. .	+ 2 32.9	120 15 57.8	+21.5
21	71 54	0.2	26.3	7.0	1.8	38	660	770	. .	. .	. .	32.3	71 59 24.8	. .	+ 2 58.8	123 8 44.8	+21.5
22	75 8	9.9	24.6	4.6	2.5	37	. .	270	. .	350	. .	32.3	75 11 12.2	. .	+ 3 38.6	126 21 12.0	+21.4
23	69 2	2.4	28.4	8.4	2.8	37	200	210	. .	. .	. .	32.3	69 5 13.3	. .	+ 2 32.7	120 14 7.2	+21.9
24	79 30	1.4	26.7	6.2	2.6	35	. .	780	. .	614	. .	32.3	79 33 38.0	. .	+ 5 8.9	130 45 8.1	+21.5
25	15 6	1.8	29.0	10.3	3.5	34	. .	. .	. .	060	060	32.3	15 10 2.0	. .	+ 15.9	66 16 39.1	+ 1.0
26	7 18	1.0	29.0	10.3	3.5	31	926	. .	. .	. .	. .	32.3	7 22 34.2	. .	+ 7.6	58 29 3.0	+ 0.8
27	42 8	1.5	27.0	9.3	3.0	34	. .	. .	. .	. .	852	32.3	42 11 50.6	. .	+ 53.3	93 19 5.1	+21.8
28	42 8	1.5	27.0	9.3	3.0	34	. .	264	. .	338	. .	32.3	42 11 58.7	41.5	+ 53.3	93 19 13.2	+21.8
29	19 56	1.5	29.5	8.9	3.4	38	*346	328	. .	. .	. .	32.3	19 58 56.1	. .	+ 21.4	71 5 38.7	+ 2.8
30	22 34	2.3	0.0	9.9	4.5	35	700	720	. .	. .	. .	32.3	22 37 35.4	. .	+ 24.6	73 44 21.2	+ 2.2
31	69 28	1.0	25.4	6.5	1.5	35	558	520	. .	. .	. .	32.3	69 31 40.7	. .	+ 2 36.4	120 49 33.3	+22.0
32	69 46	1.9	27.5	8.6	2.2	31	. .	880	. .	912	. .	32.3	69 50 35.5	. .	+ 2 39.2	120 59 35.9	+21.9
33	5 52	0.3	28.4	8.6	1.3	36	. .	. .	. .	820	804	32.3	5 55 21.5	40.6	+ 6.1	57 1 48.8	+ 1.0
34	359 50	3.7	1.5	12.0	6.0	32	. .	490	. .	520	. .	31.7	359 54 22.7	. .	— 0.1	51 0 43.8	+ 1.0
35	27 12	4.2	0.9	12.1	6.0	35	. .	905	. .	970	. .	31.7	27 15 30.0	. .	+ 30.3	78 22 21.5	—14.9
36	307 30	4.7	2.6	12.2	8.8	33	. .	. .	. .	. .	865	31.7	307 33 57.1	. .	— 1 16.0	358 39 2.3	— 0.3
37	307 30	4.7	2.6	12.2	8.8	34	000	. .	160	. .	105	31.7	307 33 56.7	. .	— 1 16.0	358 39 1.9	— 0.7
38	49 18	1.2	29.0	9.3	3.5	34	. .	. .	. .	560	590	31.7	49 23 10.1	. .	+ 1 8.2	100 30 39.5	— 0.1
39	38 46	4.0	2.6	12.8	6.4	32	. .	. .	. .	200	275	31.7	38 50 26.2	. .	+ 47.1	89 57 34.5	+ 1.0
40	348 54	9 27.0	24.8	5.5	0.4	34	. .	620	. .	680	. .	31.7	348 57 56.4	. .	— 11.4	40 4 6.2	+ 0.6
41	19 48	10 0.0	29.2	10.2	2.8	33	. .	825	. .	925	. .	31.7	19 52 4.3	48.5	+ 21.1	70 58 46.6	+ 1.9
42	48 18	9 28.5	26.2	6.7	1.1	36	205	155	. .	120	105	31.7	48 21 31.8	. .	+ 1 5.7	99 28 58.7	. .
43	333 52	29.0	27.5	7.5	3.7	33	960	. .	. .	. .	950	31.7	333 56 4.1	. .	— 28.6	25 1 56.7	— 2.3
44	19 0	10 4.4	2.5	13.8	6.4	35	500	505	. .	500	550	31.7	19 3 35.6	. .	+ 20.2	70 10 17.0	+ 3.9
45	56 32	2.6	27.5	7.9	4.6	33	145	170	. .	. .	. .	31.7	56 36 15.0	50.0	+ 1 28.2	107 44 4.4	. .
46	56 0	29.5	23.2	4.7	1.6	35	. .	. .	. .	000	005	31.7	56 3 50.0	. .	+ 1 26.1	107 11 37.3	. .
47	59 24	0.0	26.7	7.5	1.7	35	425	. .	. .	. .	515	31.7	59 27 41.1	. .	+ 1 38.2	110 35 40.5	. .
48	59 24	0.0	26.7	7.5	1.7	36	. .	345	. .	455	. .	31.7	59 27 27.0	. .	+ 1 38.2	110 35 26.4	. .
49	42 10	6.5	2.9	15.0	7.5	33	. .	925	. .	005	. .	31.7	42 15 14.4	. .	+ 52.8	93 22 28.4	+ 4.3
50	43 12	1.2	26.7	9.3	2.0	33	. .	720	. .	730	. .	31.7	43 16 7.2	. .	+ 54.7	94 23 23.1	—10.3

No.	Barom.	At Ther.
	in.	°
2	29.57	43.6
28	29.76	42.8
33	29.76	42.3
41	30.02	48.0
45	30.01	48.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
11	— 0.1	. .	. .	— 0.1
42	— 7.4	— 3.7	. .	— 11.1
45	— 7.5	— 16 13.5	. .	— 16 21.0
46	— 7.4	+ 16 13.5	. .	+ 16 6.1
47	— 4.6	— 7.1	. .	— 11.7
48	— 4.6	+ 7.0	0.0	+ 2.4

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Nov. 11	1	τ Herculis	E.	. .	. .	. .	. .	. .	10.1	16.1	18.3	22.0	16 4.19	+ 0.15	. .	− 5.35	16 15 58.99	+ 0.23
	2	η Draconis	E.	54.9	0.5	12.1	16.7	20.9	25.3	29.6	41.5	46.9	22 20.93	+ 0.98	. .	− 5.35	16 22 16.56	− 0.03
	3	ζ Ophiuchi	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	4	α^1 Herculis	E.	. .	59.8	1.8	4.0	6.1	8.1	12.4	14.0	16.6	9 3.96	− 0.67	− 5.39	− 5.36	17 8 57.93	+ 0.05
	5	β Draconis	E.	21.0	25.0	27.5	37.4	40.9	44.2	54.1	56.6	0.9	27 40.84	+ 0.39	. .	− 5.36	17 27 35.85	+ 0.04
	6	α Ophiuchi	E.	2.6	5.2	6.8	13.0	15.1	17.2	23.5	25.0	27.8	29 15.13	− 0.71	− 5.39	− 5.36	17 29 9.06	+ 0.06
	7	B. A. C. 5996	E.	13.1	15.0	17.2	23.3	25.4	27.5	33.5	35.0	37.6	37 25.36	− 0.85	. .	− 5.36	17 37 19.15	− 1.27
	8	μ Herculis	E.	26.5	29.5	31.0	38.1	40.3	42.7	49.6	51.4	54.2	41 40.37	− 0.40	− 5.29	− 5.36	17 41 34.61	− 0.07
	9	B. A. C. 6082	E.	48.5	51.6	53.5	1.3	3.8	6.4	14.0	16.0	19.2	52 3.81	− 0.16	. .	− 5.35	17 51 58.30	− 0.33
	10	γ Draconis	E.	. .	. .	40.0	43.3	46.6	50.1	53.1	. .	. .	53 46.62	+ 0.35	. .	− 5.36	17 53 41.61	− 0.21
	11	δ Ursæ Minoris	P.	. .	11.0	36.5	15.0	. .	. .	12.0	38.0	20.5	11 54.14	+16.58	. .	− 5.22	18 12 5.50	− 1.17
	12	δ Ursæ Minoris	E.	. .	. .	. .	22.0	55.5	30.0	5.0	. .	. .	11 55.46	+16.58	. .	− 5.37	18 12 6.67	0.00
	13	B. A. C. 7702	E.	2.3	5.4	7.3	14.7	17.1	19.7	27.1	29.0	32.0	1 17.18	− 1.64	. .	− 5.45	22 1 10.09	− 3.43
	14	Lacaille 9036	E.	39.2	36.0	37.9	45.3	47.8	50.3	57.8	59.6	2.7	2 47.81	− 1.63	. .	− 5.45	22 2 40.73	− 3.44
	15	θ Aquarii (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	16	θ Aquarii.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	17	π Aquarii (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	18	π Aquarii.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	19	η Aquarii (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	20	η Aquarii.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	21	ζ Pegasi	E.	. .	18.5	20.5	22.6	24.6	26.7	30.8	32.4	35.0	35 22.56	− 0.76	− 5.44	− 5.40	22 35 16.40	+ 0.10
	22	α Piscis Australis	E.	40.8	43.7	45.3	52.6	54.9	57.4	4.4	6.4	9.3	50 54.98	− 1.53	− 5.48	− 5.41	22 50 48.04	+ 0.11
	23	α Pegasi	E.	28.3	31.0	32.5	38.9	41.0	43.0	49.4	51.0	53.6	58 40.97	− 0.68	− 5.39	− 5.41	22 58 34.88	+ 0.01
	24	ο Cephei (R.).	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	25	θ Cephei	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	26	θ Piscium	E.	34.6	37.2	38.7	45.0	47.0	49.0	55.2	56.7	59.3	21 46.97	− 0.84	− 5.43	− 5.41	23 21 40.72	+ 0.08
	27	λ Draconis, S. P.	E.	45.6	38.0	33.8	15.8	9.6	3.6	46.0	41.0	33.5	24 9.66	− 3.80	. .	− 5.41	11 24 0.45	+ 0.24
	28	γ Cephei (R.).	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	29	γ Cephei	E.	. .	. .	. .	17.7	27.1	36.1	54.4	0.7	12.4	34 17.85	+ 3.49	. .	− 5.41	23 34 15.93	− 0.31
	30	Groom. 4163 (R.)	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	31	Groom. 4163	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	32	4 Ceti	E.	17.5	20.1	21.6	27.8	29.8	31.8	37.9	39.5	42.0	1 29.78	− 1.00	. .	− 5.41	0 1 23.37	− 3.32
	33	5 Ceti	E.	45.5	48.0	49.8	55.9	57.9	59.9	6.0	7.6	10.1	1 57.86	− 1.00	. .	− 5.41	0 1 51.45	− 3.32
	34	B. A. C. 38	E.	53.0	56.5	58.5	6.6	9.4	12.1	20.1	22.2	25.6	9 9.33	− 1.80	. .	− 5.41	0 9 2.12	− 4.07
	35	β Ceti	D.	16.3	18.9	20.6	27.1	29.3	31.3	38.0	39.6	42.0	37 29.23	− 1.28	− 5.45	. .	. . . .	. .
	36	B. A. C. 259	E.	42.7	46.0	47.8	55.6	58.1	0.6	8.6	10.5	13.6	49 58.17	− 0.14	. .	− 5.40	0 49 52.63	− 3.48
	37	ε Piscium	D.	24.8	27.3	28.9	35.0	37.1	39.1	45.2	46.9	49.3	56 37.07	− 0.81	− 5.35	. .	. . . .	. .
	38	B. A. C. 326	E.	43.1	46.0	47.9	55.3	57.6	0.1	7.5	9.0	12.3	1 57.64	− 1.60	. .	− 5.40	0 1 50.64	− 3.93
	39	Polaris	D.	. .	. .	16.0	. .	. .	. .	46.5	52.0	35.5	12 59.34	+42.86	. .	. .	. . . .	. .
	40	Polaris	E.	. .	. .	8.0	33.5	2.0	28.5	54.0	. .	. .	13 1.20	+42.86	. .	− 5.43	1 13 38.63	− 0.56
	41	η Piscium	D.	. .	. .	. .	. .	. .	. .	5.9	7.5	10.0	24 57.41	− 0.67	− 5.36	. .	. . . .	. .
	42	ο Piscium	D.	45.0	47.7	49.2	55.3	57.4	59.5	5.8	7.3	9.9	38 57.46	− 0.79	− 5.3	. .	. . . .	. .
	43	β Arietis	E.	40.8	43.6	45.1	51.6	53.9	56.0	2.6	4.0	6.7	47 53.81	− 0.57	− 5.26	− 5.43	1 47 47.81	− 0.15
	44	Moon I, S.	E.	40.6	43.2	44.9	51.2	53.5	55.6	2.1	3.8	6.4	54 53.48	− 0.70	. .	− 5.37	1 54 47.41	+71.06
	45	Neptune	E.	. .	. .	40.9	43.0	45.2	47.2	49.3	. .	. .	58 45.12	− 0.76	. .	− 5.37	1 58 38.99	. .
	46	ξ^1 Ceti	D.	20.0	22.5	24.1	30.4	32.4	34.4	40.5	42.3	44.4	6 32.33	− 0.79	− 5.27	. .	. . . .	. .
	47	B. A. C. 871	E.	36.2	39.5	41.5	49.1	51.7	54.4	2.0	4.0	7.2	42 51.73	− 0.14	. .	− 5.35	2 42 46.24	− 4.29
	48	Ianthe	E.	0.5	3.5	5.7	13.4	15.9	18.6	26.0	28.2	31.2	49 15.89	− 0.14	. .	− 5.35	2 49 10.40	. .
	49	Ate	E.	31.9	34.7	36.4	43.1	45.4	47.7	54.5	56.3	58.9	57 45.43	− 0.46	. .	− 5.34	2 57 39.63	. .
	50	B. A. C. 997	E.	42.5	45.3	47.1	54.0	56.5	58.8	5.8	7.6	10.6	6 56.47	− 1.51	. .	− 5.34	3 6 49.62	− 3.76

2, 11, 27, 39, 44. Bisections at sets B and D.
9, 17. Telescope micrometer reading increased one revolution in reduction.
28. Bisections at wires II and III.
29. Bisections at wires V and VI.
32, 48, 49. Wire A used.
33. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	352 14	9 28.3	26.7	7.0	2.7	37	. .	. .	. .	410	420	31.7	352 17 12.8	. .	− 7.9	43 23 26.1	+ 0.9
2	337 2	10 1.2	28.5	8.3	4.5	32	745	. .	. .	. .	725	31.7	337 6 21.8	. .	− 24.6	28 12 18.4	+ 1.5
3	49 8	9 29.8	27.5	9.4	1.5	36	. .	. .	. .	350	370	31.7	49 11 27.4	. .	+ 1 7.3	100 18 55.9	+ 3.8
4	24 18	29.2	27.8	9.1	1.9	37	. .	. .	. .	040	100	31.7	24 21 16.8	. .	+ 26.3	75 28 4.3	+ 4.4
5	346 26	10 9.4	21.8	9.5	3.7	33	. .	270	. .	290	. .	31.7	346 30 13.2	. .	− 14.0	37 36 20.2	+ 0.5
6	26 10	2.8	0.0	10.8	5.3	33	. .	. .	. .	650	650	31.7	26 14 6.5	. .	+ 28.7	77 20 56.4	+ 3.2
7	34 12	0.9	26.7	8.0	3.0	34	. .	880	. .	900	. .	31.7	34 15 49.6	. .	+ 39.7	85 22 50.5	− 4.4
8	11 2	3.6	0.1	11.5	3.8	34	. .	830	. .	835	. .	31.7	11 5 48.0	. .	+ 11.4	62 12 20.6	+ 3.3
9	1 34	0.5	29.7	10.2	3.3	35	. .	030	. .	065	. .	31.7	1 37 30.8	. .	+ 1.7	52 43 53.7	+ 1.8
10	347 20	1.0	28.7	9.3	3.2	35	. .	. .	. .	815	865	31.7	347 23 35.1	. .	− 13.0	38 29 43.3	+ 1.8
11	312 14	0.2	28.3	7.3	4.1	33	570	500	. .	545	610	31.7	312 18 10.7	. .	− 1 3.7	3 23 28.2	+ 0.9
12	312 14	0.2	28.3	7.3	4.1	33	. .	. .	500	. .	525	31.7	312 18 10.4	. .	− 1 3.7	3 23 27.9	+ 0.6
13	73 24	9 29.7	25.6	5.8	0.7	28	. .	470	. .	570	. .	32.1	73 29 29.1	. .	+ 3 17.3	124 39 7.6	+ 2.8
14	73 24	29.7	25.6	5.8	0.7	34	. .	090	. .	130	. .	32.1	73 28 3.5	. .	+ 3 17.0	124 37 41.7	+ 2.9
15	132 40	10 3.7	0.8	10.5	6.0	36	320	325	. .	. .	. .	32.1	132 43 24.7	. .	− 1 4.1	98 24 0.6	− 4.0
16	47 12	2.7	0.0	9.8	4.9	31	. .	. .	. .	410	430	32.1	47 16 41.2	. .	+ 1 4.1	98 24 6.5	+ 1.9
17	141 48	2.0	0.3	11.5	6.5	33	920	930	. .	. .	. .	32.1	141 52 1.5	42.5	− 46.5	89 15 6.2	+ 0.6
18	38 4	1.3	27.3	7.4	2.4	34	. .	. .	. .	175	185	32.1	38 8 1.3	. .	+ 46.5	89 15 9.0	+ 3.4
19	140 18	2.1	29.5	10.2	7.1	34	850	880	. .	. .	. .	32.1	140 21 47.5	. .	− 49.1	90 45 22.8	− 0.4
20	39 34	9 28.9	24.5	5.9	0.3	33	. .	. .	. .	400	400	32.1	39 38 15.4	. .	+ 49.1	90 45 25.7	+ 2.5
21	28 38	29.2	27.0	7.5	1.5	34	. .	. .	. .	210	240	32.1	28 42 1.5	. .	+ 32.5	79 48 55.2	+ 2.4
22	69 4	10 2.3	28.7	8.5	4.0	33	. .	980	. .	110	. .	32.1	69 8 1.6	. .	+ 2 34.4	120 16 27.2	+ 2.8
23	24 18	1.8	27.5	8.2	1.5	38	. .	645	. .	655	. .	32.1	24 20 52.4	. .	+ 26.9	75 27 40.5	+ 3.6
24	208 28	0.5	28.3	7.8	1.1	33	865	880	. .	. .	. .	32.1	208 32 4.2	. .	+ 32.3	22 33 44.7	− 4.4
25	331 24	1.2	29.3	9.0	2.7	34	. .	. .	. .	135	220	32.1	331 28 1.6	. .	− 32.3	22 33 50.5	+ 1.4
26	33 8	9 29.3	25.9	6.9	1.6	37	. .	650	. .	760	. .	32.1	33 11 8.2	. .	+ 38.8	84 18 8.2	+ 4.2
27	288 54	10 2.7	28.7	9.5	4.5	36	845	. .	. .	. .	720	32.1	288 57 19.2	. .	− 2 51.4	340 0 49.0	+ 4.8
28	217 58	4.8	1.5	11.5	4.2	32	850	865	. .	. .	. .	32.1	218 2 16.7	. .	+ 46.5	13 3 18.0	− 4.2
29	321 54	2.0	28.3	7.3	3.3	34	. .	. .	. .	995	010	32.1	321 57 48.8	. .	− 46.5	13 3 23.5	+ 1.3
30	214 44	0.6	28.5	8.6	1.2	29	650	720	. .	. .	. .	32.1	214 49 7.5	. .	+ 41.3	16 16 32.4	− 2.9
31	325 8	9 29.0	27.5	7.0	3.0	38	. .	. .	. .	530	500	32.1	325 10 57.2	. .	− 41.3	16 16 37.1	+ 1.8
32	42 0	10 0.8	1.0	11.3	5.6	31	625	635	. .	. .	. .	32.1	42 7 10.0	. .	+ 53.7	93 14 24.9	+20.6
33	42 0	0.8	1.0	11.3	5.6	35	. .	. .	. .	415	425	32.1	42 1 7.0	. .	+ 53.5	93 8 21.7	+20.6
34	79 32	2.5	28.4	6.7	2.5	35	. .	055	. .	185	. .	32.1	79 35 45.9	. .	+ 5 13.7	130 47 20.8	+10.6
35	57 28	9 27.2	25.0	4.9	29.5	33	. .	640	. .	640	. .	32.1	57 32 12.1	. .	+ 1 33.3	108 40 6.6	+ 2.2
36	1 0	10 4.7	4.3	12.8	7.8	34	. .	320	. .	360	. .	32.1	1 3 53.5	. .	+ 1.1	52 10 15.8	+29.5
37	31 36	3.7	29.8	9.6	3.5	35	. .	440	. .	500	. .	32.1	31 39 39.2	. .	+ 36.7	82 46 37.1	+ 2.1
38	72 16	4.4	29.1	9.8	5.1	37	. .	160	. .	090	. .	32.1	72 19 13.1	. .	+ 3 4.8	123 28 39.1	+15.9
39	310 12	3.2	0.5	9.8	5.3	34	. .	. .	. .	965	000	32.1	310 15 48.6	. .	− 1 10.2	1 20 59.6	+ 2.4
40	310 12	3.2	0.5	9.8	5.3	34	940	. .	880	. .	930	32.1	310 15 47.3	. .	− 1 10.2	1 20 58.3	+ 1.1
41	24 8	2.4	27.6	8.6	3.2	39	. .	. .	. .	. .	175	32.1	24 10 44.2	. .	+ 26.8	75 17 32.2	+ 1.9
42	30 18	9 29.5	26.8	5.2	6.0	38	. .	265	. .	300	. .	32.1	30 20 58.4	. .	+ 34.9	81 27 54.5	− 0.2
43	18 38	28.6	26.8	8.6	0.7	37	. .	740	. .	770	. .	32.1	18 41 7.3	. .	+ 20.2	69 47 48.7	+ 1.9
44	25 22	10 4.2	10.5	1.2	4.2	26	830	. .	990	. .	270	32.1	25 27 47.5	. .	+ 28.4	76 34 37.1	. .
45	28 38	2.7	0.3	10.0	3.8	33	. .	230	. .	170	. .	32.1	28 42 13.9	. .	+ 32.7	79 49 7.8	. .
46	30 34	3.2	29.3	9.7	4.3	37	. .	655	. .	655	. .	32.1	30 37 5.8	. .	+ 35.3	81 44 2.3	+ 0.7
47	1 2	1.3	0.3	10.1	3.6	37	. .	715	. .	750	. .	32.1	1 5 5.1	. .	+ 1.1	52 11 27.4	+24.6
48	0 54	4.5	3.2	13.0	6.5	33	. .	195	. .	215	. .	32.1	1 0 44.4	. .	+ 1.1	52 7 6.7	− 0.1
49	13 28	2.4	0.0	10.9	4.6	39	. .	340	. .	295	. .	32.1	13 33 13.0	. .	+ 14.4	64 39 48.6	− 1.4
50	68 16	2.2	27.2	8.0	3.8	35	. .	450	. .	490	. .	32.1	68 19 40.3	. .	+ 2 29.4	119 28 30.9	+21.3

No.	Barom.	At. Ther.
	in.	°
17	30.05	46.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
44	−25 52.9	+ 16 33.8	. .	− 42 26.7
45	− 0.1	. . .	. .	− 0.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Nov. 11	1	B. A. C. 1015 . .	E.	41.0	44.1	46.0	53.5	56.2	58.7	6.2	8.0	11.2	9 56.10	− 1.66	. . .	− 5.34	3 9 49.10	− 3.81
	2	B. A. C. 1037 . .	E.	54.9	57.4	59.0	5.7	8.0	10.1	16.6	18.4	21.1	14 7.91	− 1.35	. .	− 5.34	3 14 1.22	− 3.72
	3	Clotho	E.	38.5	41.0	42.7	48.8	50.9	52.9	59.0	0.7	3.2	22 50.86	− 1.00	. .	− 5.34	3 22 44.52	. .
	4	Egeria	E.	8.5	11.4	13.2	19.8	22.0	24.3	31.0	32.5	35.4	27 22.01	− 0.49	. .	− 5.34	3 27 16.18	. .
	5	η Tauri	E.	59.9	2.7	4.5	11.1	13.4	15.5	22.0	23.7	26.6	40 13.27	− 0.49	− 5.28	− 5.45	3 40 7.33	− 0.17
	6	Pomono . . .	E.	43.0	46.4	47.7	54.0	56.1	58.3	4.6	6.2	8.9	41 56.13	− 0.62	. .	− 5.33	3 41 50.18	. .
	7	ζ Persei	E.	12.3	15.3	17.1	24.2	26.7	29.1	36.1	38.0	41.0	46 26.64	− 0.32	− 5.34	− 5.45	3 46 20.87	− 0.12
	8	γ¹ Eridani. . . .	E.	9.5	12.0	13.8	20.0	22.1	24.4	30.5	32.1	34.8	52 22.13	− 1.19	− 5.37	− 5.45	3 52 15.49	− 0.04
	9	B. A. C. 4340 . .	P.	13.8	16.4	17.8	24.0	26.2	28.2	34.4	35.9	38.4	49 26.12	− 0.82	. .	− 5.40	12 49 19.90	− 1.48
	10	12 Canum Venat. .	P.	1.7	5.0	12.4	14.7	17.5	20.0	22.6	29.8	33.3	50 17.44	− 0.06	− 5.27	− 5.29	12 50 12.09	− 0.02
	11	B. A. C. 4367 . .	P.	52.3	54.8	56.5	2.7	4.8	6.9	13.0	14.6	17.2	56 4.76	− 0.69	. .	− 5.39	12 55 58.68	− 1.48
	12	Polaris, S. P. .	P.	7.5	19.0	22.0	55.0	29.0	0.5	34.0	36.5	47.5	14 27.83	−45.82	. .	− 5.29	1 13 36.72	− 2.35
	13	α Virginis . . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	14	ζ Virginis . . .	P.	14.9	17.4	19.0	24.9	27.2	29.1	35.3	36.8	39.3	28 27.10	− 0.90	− 5.39	− 5.29	13 28 20.91	+ 0.10
	15	η Ursæ Majoris. .	P.	23.6	27.5	36.3	39.2	42.5	45.6	49.0	57.7	1.7	42 42.57	+ 0.33	. .	− 5.29	13 42 37.61	+ 0.03
	16	η Bootis	P.	38.0	40.9	42.5	49.0	51.1	53.3	59.7	1.3	4.0	48 51.09	− 0.54	− 5.36	− 5.29	13 48 45.26	+ 0.02
	17	Mercury II, S. .	P.	37.0	39.6	41.2	47.2	49.5	51.6	57.7	59.2	1.8	58 49.42	− 1.07	. .	− 5.38	13 58 42.97	− 0.25
	18	α Draconis . . .	P.	. .	. .	. .	4.2	9.0	13.9	23.3	26.6	32.8	1 4.00	+ 1.34	. .	− 5.29	14 1 0.05	+ 0.14
	19	α Bootis	P.	51.5	54.3	55.9	2.4	4.6	6.7	13.3	14.9	17.6	10 4.58	− 0.52	− 5.39	− 5.29	14 9 58.77	+ 0.10
	20	5 Ursæ Minoris. .	P.	55.4	5.7	12.5	38.3	47.0	55.8	21.5	28.0	38.5	27 46.97	+ 3.41	. .	− 5.29	14 27 45.09	− 0.13
	21	β Ursæ Minoris. .	P.	17.9	27.3	33.3	56.7	4.5	12.0	35.6	41.3	50.6	51 4.36	+ 2.94	. .	− 5.30	14 51 2.00	+ 0.10
12	22	Sun I, N. . . .	P.	40.5	42.8	44.9	51.2	53.5	55.5	2.0	3.5	6.2	8 53.34	− 1.22	. .	− 5.36	15 8 46.70	. .
	23	Sun II, S. . . .	P.	56.8	59.5	1.0	7.5	9.7	11.7	18.3	19.9	22.5	11 9.66	− 1.22	. .	− 5.36	15 11 3.08	. .
	24	γ² Ursæ Minoris . .	P.	24.4	29.2	42.5	49.3	56.0	2.9	9.2	22.8	27.3	20 55.96	+ 2.37	. .	− 5.30	15 20 53.03	− 0.22
	25	ζ Ursæ Minoris . .	P.	28.9	41.5	48.3	18.3	28.6	38.2	8.0	15.2	28.3	48 28.37	+ 4.13	. .	− 5.30	15 48 27.20	− 0.04
	26	A Draconis . . .	P.	40.3	47.4	51.9	8.8	14.9	20.4	37.4	41.5	48.7	28 14.59	+ 1.84	. .	− 5.30	16 28 11.13	− 0.05
	27	η Herculis . . .	P.	26.5	29.9	31.7	39.4	42.3	44.8	52.8	54.8	57.9	38 42.21	− 0.06	− 5.28	− 5.30	16 38 36.85	− 0.01
	28	κ Ophiuchi . . .	P.	39.8	42.4	44.0	50.2	52.3	54.4	0.6	2.0	4.6	51 52.26	− 0.73	− 5.36	− 5.31	16 51 46.22	+ 0.09
	29	ε Ursæ Minoris. .	P.	25.0	36.0	7.0	21.5	36.0	51.5	6.5	37.0	48.0	58 36.51	+ 6.88	. .	− 5.31	16 58 38.08	+ 0.18
	30	α¹ Herculis . . .	P.	51.2	53.8	55.4	1.7	3.8	6.0	12.0	13.8	16.5	9 3.80	− 0.63	− 5.27	− 5.31	17 8 57.86	− 0.02
	31	β Draconis . . .	P.	20.6	24.8	27.3	37.4	40.7	44.2	54.0	56.6	0.9	27 40.72	+ 0.45	. .	− 5.31	17 27 35.86	+ 0.06
	32	α Ophiuchi . . .	P.	2.5	5.0	6.7	12.9	15.0	17.1	23.5	25.0	27.6	29 15.03	− 0.67	− 5.33	− 5.31	17 29 9.05	+ 0.05
	33	ω Draconis . . .	P.	7.6	14.6	18.6	30.1	41.4	52.6	4.0	8.1	15.2	37 41.36	+ 1.80	. .	− 5.31	17 37 37.85	− 0.04
	34	μ Herculis . . .	P.	26.5	29.3	31.0	37.9	40.3	42.7	49.5	51.3	54.2	41 40.30	− 0.36	− 5.27	− 5.31	17 41 34.63	− 0.04
	35	ψ¹ Draconis . . .	P.	. .	. .	. .	. .	. .	. .	. .	40.4	48.5	44 8.39	+ 2.37	. .	− 5.32	17 44 5.44	− 0.12
	36	γ Draconis . . .	P.	26.9	31.0	33.5	43.3	46.6	49.9	59.7	2.2	6.2	53 46.59	+ 0.41	. .	− 5.32	17 53 41.68	− 0.11
	37	γ² Sagittarii . . .	P.	41.2	44.2	46.0	53.0	55.3	57.9	4.9	6.6	9.7	57 55.42	− 1.49	− 5.33	− 5.32	17 57 48.61	+ 0.02
	38	δ Ursæ Minoris. .	P.	. .	. .	46.0	20.0	55.0	29.5	4.5	. .	. .	11 55.00	+16.91	. .	− 5.32	18 12 6.59	+ 0.25
	39	η Serpentis . . .	P.	46.0	48.6	50.1	56.3	58.3	0.4	6.5	8.0	10.7	14 58.32	− 0.95	− 5.36	− 5.32	18 14 52.05	+ 0.10
	40	α Cygni	P.	58.9	2.5	4.7	13.2	16.1	19.0	27.0	29.8	33.4	37 16.13	+ 0.15	− 5.19	− 5.33	20 37 10.95	− 0.12
	41	B. A. C. 7226 . .	P.	8.0	11.0	12.8	20.0	22.5	25.0	32.3	34.0	37.2	44 22.53	− 1.54	. .	− 5.35	20 44 15.64	− 2.96
	42	ν Cygni	P.	21.1	24.5	26.5	34.7	37.3	40.0	48.0	50.0	53.4	52 37.28	0.00	− 5.28	− 5.33	20 52 31.95	+ 0.01
	43	12 Year Cat. 1879	P.	. .	. .	. .	. .	. .	. .	53.4	2.0	17.0	53 5.75	+ 5.20	. .	− 5.33	20 53 5.62	− 0.34
	44	σ² Ursæ Majoris, S. P.	P.	9.0	2.3	57.9	47.4	42.0	36.4	31.0	. .	. .	59 36.59	− 3.57	. .	− 5.33	8 59 27.69	− 0.17
	45	Mars I, S. . . .	P.	19.2	21.9	23.6	30.0	32.1	34.2	40.9	42.5	45.1	6 32.17	− 1.32	. .	− 5.35	21 6 25.50	+ 0.32
	46	ζ Cygni	P.	30.1	33.0	34.9	41.9	44.2	46.6	53.7	55.5	58.4	7 44.26	− 0.30	− 5.32	− 5.33	21 7 38.63	0.00
	47	β Aquarii . . .	P.	55.4	57.8	59.5	5.5	7.6	9.7	15.9	17.4	19.9	25 7.63	− 0.99	− 5.39	− 5.33	21 25 1.31	+ 0.09
	48	β Cephei	P.	. .	. .	. .	. .	. .	17.0	28.9	33.3	41.0	27 4.90	+ 2.00	. .	− 5.33	21 27 1.57	− 0.08
	49	Saturn I, N. . .	P.	17.3	20.0	21.6	. .	. .	. .	38.7	40.3	42.9	30 30.13	− 1.17	. .	− 5.35	21 30 23.61	. .
	50	Saturn II, S. . .	P.	. .	. .	27.0	29.1	31.3	33.5	35.6	. .	. .	30 31.30	− 1.17	. .	− 5.35	21 30 24.58	. .

3, 4, 6. Wire A used.
18, 35. Bisections at wires V and VI.
20, 21, 24, 25, 26, 29, 33, 43, 44, 48. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	74 48	10 4.3	29.5	8.4	4.8	37	. .	665	. .	650	. .	32.1	74 51 5.3	. .	+ 3 37.5	126 1 4.0	+20.9
2	61 0	8.6	3.7	13.5	8.5	32	. .	450	. .	470	. .	32.1	61 4 20.6	. .	+ 1 47.7	112 12 29.5	+21.9
3	42 12	2.0	27.8	10.2	4.0	36	. .	520	. .	540	. .	32.1	42 17 56.5	. .	+ 54.4	93 25 12.1	− 5.7
4	15 2	3.0	0.3	11.4	4.5	35	. .	400	. .	480	. .	32.1	15 8 12.0	. .	+ 16.2	66 14 49.4	− 1.5
5	15 6	3.5	0.2	9.8	4.0	33	935	980	. .	. .	. .	32.1	15 10 2.0	. .	+ 16.2	66 16 39.4	+ 1.3
6	21 12	7.7	6.1	15.7	8.7	36	245	335	. .	. .	. .	32.1	21 17 54.0	38.0	+ 23.3	72 24 38.5	− 1.8
7	7 18	2.5	1.0	10.5	4.3	31	. .	880	. .	895	. .	32.1	7 22 33.8	. .	+ 7.8	58 29 2.8	+ 0.7
8	52 40	6.0	1.7	12.0	5.8	34	. .	185	. .	210	. .	32.1	52 43 56.3	. .	+ 1 18.5	103 51 36.0	+ 3.0
9	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	40.0	. .	. . . .	. .
10	359 50	4.8	3.1	14.0	6.8	32	. .	400	. .	415	. .	32.5	359 54 23.6	. .	− 0.1	51 0 44.7	+ 1.6
11	27 12	2.0	29.0	9.5	3.9	36	095	090	. .	. .	. .	32.5	27 15 30.3	. .	+ 30.7	78 22 22.2	−15.1
12	307 30	9.5	28.1	7.5	4.7	34	225	245	270	245	240	32.5	307 33 57.1	. .	− 1 17.1	358 39 1.2	− 1.8
13	49 18	8.7	24.8	6.0	1.2	29	. .	880	. .	860	. .	32.5	49 23 6.6	42.9	+ 1 9.1	100 30 36.9	− 2.9
14	38 46	9 28.2	24.5	5.9	1.2	32	690	720	. .	. .	. .	32.5	38 50 25.7	. .	+ 47.7	89 57 34.6	+ 0.9
15	348 54	29.1	25.3	6.0	2.5	34	535	510	. .	570	580	32.5	348 57 57.7	. .	− 11.5	40 4 7.4	+ 1.5
16	19 48	10 4.0	1.4	12.8	6.5	33	685	660	. .	650	680	32.5	19 52 5.2	45.0	+ 21.3	70 58 47.7	+ 2.8
17	48 28	4.6	0.4	10.8	5.2	34	270	240	. .	260	300	32.5	48 31 56.7	. .	+ 1 6.7	99 39 24.6	. .
18	333 52	0.5	28.0	8.3	4.0	33	. .	. .	. .	745	780	32.5	333 56 7.7	. .	+ 28.8	25 2 0.1	+ 0.8
19	19 0	1.0	28.0	9.5	3.4	35	895	875	. .	865	915	32.5	19 3 34.4	. .	+ 20.3	70 10 15.9	+ 2.5
20	322 36	1.0	29.0	8.5	6.1	35	395	. .	365	. .	455	32.5	322 39 41.2	. .	− 44.7	13 45 17.7	0.0
21	324 10	9 26.2	24.2	4.2	1.1	31	680	. .	645	. .	650	32.5	324 14 43.3	50.0	− 42.1	15 20 22.4	0.0
22	56 16	10 0.0	26.6	8.2	3.5	33	175	285	. .	. .	. .	32.5	56 20 15.7	. .	+ 1 27.3	107 28 4.2	. .
23	56 48	9 27.7	23.6	5.1	0.8	31	. .	. .	. .	940	900	32.5	56 52 38.5	51.7	+ 1 29.0	108 0 28.7	. .
24	326 34	28.4	26.0	6.9	3.0	35	115	. .	045	. .	060	32.5	326 37 48.8	. .	− 39.2	17 43 30.8	− 1.3
25	320 40	25.3	23.4	5.0	0.8	34	595	. .	550	. .	540	32.3	320 43 59.0	54.3	− 47.3	11 49 32.9	+ 0.2
26	329 48	10 4.5	1.1	10.2	7.7	33	860	. .	820	. .	845	31.6	329 52 2.0	58.5	− 33.3	20 57 49.9	+ 0.6
27	359 40	9 29.4	25.2	6.5	2.0	33	835	830	. .	810	865	31.5	359 44 7.3	59.0	− 0.3	50 50 28.2	+ 3.2
28	29 14	10 1.8	27.5	7.5	4.5	30	220	200	. .	240	255	31.3	29 19 0.0	. .	+ 32.9	80 25 54.1	+ 4.0
29	316 36	0.8	28.1	7.0	5.3	32	995	. .	065	. .	160	31.2	316 40 16.5	59.7	− 54.0	7 45 43.7	+ 1.6
30	24 18	1.7	27.0	7.3	2.8	37	055	065	. .	075	105	31.0	24 21 15.5	. .	+ 25.9	75 28 2.6	+ 2.3
31	346 26	1.0	27.6	6.7	4.0	33	300	310	. .	. .	. .	30.7	346 30 13.0	. .	− 13.7	37 36 20.5	+ 0.6
32	26 10	1.3	27.5	7.0	4.4	33	. .	750	. .	760	. .	30.6	26 14 5.6	60.4	+ 28.2	77 20 55.0	+ 1.6
33	330 2	1.9	29.1	8.1	5.6	36	970	. .	965	. .	. .	30.5	330 5 15.1	. .	− 32.9	21 11 3.4	− 1.2
34	11 2	9 27.8	25.0	5.3	0.9	35	. .	160	. .	185	. .	30.4	11 5 46.6	. .	+ 11.2	62 12 19.0	+ 1.4
35	326 38	29.0	26.0	5.5	2.6	35	. .	. .	. .	435	470	30.3	326 41 41.8	. .	− 37.6	17 47 25.4	+ 2.0
36	347 20	28.9	25.0	5.0	1.6	36	050	990	. .	035	070	30.2	347 23 33.3	. .	− 12.8	38 29 41.7	0.0
37	69 12	10 2.3	27.5	7.1	4.3	31	. .	275	. .	350	. .	30.2	69 16 42.0	. .	+ 2 29.9	120 25 33.1	− 1.5
38	312 14	0.0	27.3	6.4	4.9	33	495	465	490	505	515	29.9	312 18 9.3	. .	− 1 2.7	3 23 27.8	+ 0.3
39	41 44	1.2	26.6	6.9	2.6	31	585	570	. .	565	540	29.9	41 48 39.0	60.3	+ 51.1	92 55 51.3	+ 2.7
40	354 0	9 28.1	26.0	4.5	0.7	36	. .	810	. .	865	. .	31.7	354 3 22.4	54.0	− 6.0	45 9 37.6	+ 2.3
41	72 26	10 2.8	27.6	6.3	2.7	36	690	695	. .	790	770	31.7	72 29 20.8	. .	+ 3 1.4	123 38 43.4	− 2.6
42	358 8	2.5	29.5	8.5	4.0	33	545	535	. .	. .	. .	31.7	358 12 8.9	. .	− 1.8	49 18 28.3	+ 3.3
43	318 46	0.4	26.7	6.2	2.6	37	. .	. .	. .	380	420	31.7	318 49 12.3	. .	− 50.7	9 54 42.8	+ 0.7
44	286 32	1.5	26.5	5.9	3.2	38	305	. .	345	. .	. .	31.7	286 34 57.2	. .	− 3 12.3	337 38 6.1	+ 5.9
45	57 18	9 29.5	25.7	5.2	0.6	38	005	000	. .	. .	. .	31.7	57 21 3.3	. .	+ 1 30.3	108 28 54.8	. .
46	9 6	10 2.4	0.9	9.5	4.9	32	. .	. .	.	920	945	31.7	9 10 17.9	. .	+ 9.4	60 16 48.5	+ 3.3
47	44 56	1.9	27.5	6.7	2.5	35	. .	150	. .	215	. .	31.7	44 59 45.1	. .	+ 58.1	96 7 4.4	+ 3.7
48	328 50	9 29.5	25.0	5.0	1.4	37	. .	. .	. .	980	015	31.7	328 53 4.2	. .	− 35.1	19 58 50.3	+ 0.4
49	55 0	10 1.0	27.4	6.9	2.5	33	670	. .	. .	. .	750	31.7	55 4 7.7	. .	+ 1 23.0	106 11 51.9	. .
50	55 0	1.0	27.4	6.9	2.5	32	. .	630	. .	700	. .	31.7	55 4 23.9	. .	+ 1 23.0	106 12 8.1	. .

No.	Barom.	At. Ther.
	in.	°
6	30.06	42.0
9	30.11	40.8
13	30.10	43.4
16	30.10	45.3
21	30.08	47.3
23	30.08	48.5
25	30.06	50.7
26	30.06	54.9
27	30.06	56.8
29	30.08	67.8
32	30.05	59.9
39	30.04	59.4
40	30.04	55.1

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
17	− 7.2	− 3.7	. .	− 10.9
22	− 7.4	+ 16 12.2	. .	+ 16 4.8
23	− 7.5	− 16 12.2	. .	− 16 19.7
45	− 6.8	− 4.6	. .	− 11.4
49	− 0.7	+ 8.1	. .	+ 7.4
50	− 0.7	− 8.1	. .	− 8.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	Mean wire.	Inst.	Clock appar'nt	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Nov. 12	1	ε Pegasi	P.	58.9	1.4	3.0	9.1	11.2	13.3	19.5	21.0	23.6	38 11.22	− 0.72	− 5.34	− 5.33	21 38 5.17	+ 0.02
	2	79 Draconis (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	3	79 Draconis	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	4	α Aquarii (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	5	α Aquarii	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	6	θ Aquarii (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	7	θ Aquarii	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	8	π Aquarii (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	9	π Aquarii	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	10	η Aquarii (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	11	η Aquarii	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	12	ζ Pegasi (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	13	ζ Pegasi	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	14	ι Cephei (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	15	ι Cephei	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	16	ο Cephei (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	17	ο Cephei	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	18	γ Cephei (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	19	γ Cephei	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	2	B. A. C. 8352	P.	51.8	54.6	56.4	3.6	5.9	8.4	15.3	17.2	20.1	56 5.92	− 1.48	. .	− 5.35	23 55 59.09	− 3.74
	21	4 Ceti	P.	17.4	20.0	21.4	27.5	29.6	31.7	37.7	39.3	41.9	1 29.61	− 0.98	. .	− 5.35	0 1 23.28	− 3.31
	22	5 Ceti	P.	45.5	48.0	49.6	55.8	57.8	59.8	5.9	7.4	10.0	1 57.76	− 0.98	. .	− 5.35	0 1 51.43	− 3.31
	23	B. A. C. 22	P.	. .	. .	. .	. .	12.6	15.3	20.7	22.8	26.3	5 9.94	− 1.78	. .	− 5.35	0 5 2.81	− 4.06
	24	α Cassiopeæ (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	25	α Cassiopeæ	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	26	ε Piscium (R.)	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	27	ε Piscium	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	28	B. A. C. 332	P.	15.8	18.4	20.0	26.2	28.3	30.4	36.6	38.0	40.7	2 28.27	− 1.11	. .	− 5.35	1 2 21.81	− 3.60
	29	B. A. C. 366	P.	54.1	57.2	59.0	7.0	9.3	11.8	19.4	21.2	24.4	7 9.27	− 1.63	. .	− 5.35	1 7 2.29	− 3.98
	30	Polaris	P.	. .	. .	6.5	32.0	58.0	25.5	51.0	. .	. .	12 58.60	+43.20	. .	− 5.35	1 13 36.45	− 2.50
	31	B. A. C. 424	P.	19.3	22.4	24.3	31.5	33.8	36.3	43.7	45.5	48.4	18 33.91	− 1.55	. .	− 5.35	1 18 27.01	− 3.91
	32	B. A. C. 445	P.	51.6	54.6	56.4	3.6	5.9	8.3	15.3	17.1	20.2	23 5.89	− 1.51	. .	− 5.35	1 22 59.03	− 3.88
	33	B. A. C. 570	P.	1.7	4.8	6.8	15.0	17.7	20.4	28.3	30.5	33.7	46 17.66	− 1.75	. .	− 5.35	1 46 10.56	− 4.07
	34	B. A. C. 578	P.	55.7	58.9	0.9	8.7	11.3	13.9	21.9	23.9	27.4	48 11.40	− 1.72	. .	− 5.35	1 48 4.33	− 4.04
	35	Durch. 10°, 285	P.	8.5	11.0	12.7	16.8	18.9	21.0	22.9	25.1	. .	58 20.94	− 0.75	. .	− 5.35	1 58 14.84	− 3.71
	36	Neptune	P.	26.6	29.3	30.9	37.0	39.1	41.3	47.5	49.0	51.6	58 39.14	− 0.75	. .	− 5.35	1 58 33.04	. .
	37	α Draconis, S. P.	P.	37.0	31.2	27.4	17.9	13.3	8.3	3.5	59.0	. .	1 8.28	− 3.19	. .	− 5.35	14 0 59.74	− 0.18
	38	ξ¹ Ceti	P.	20.0	22.6	24.1	30.3	32.5	34.5	40.7	42.2	44.8	6 32.41	− 0.78	− 5.36	− 5.35	2 6 26.28	+ 0.05
	39	5 Ursæ Minoris, S.P.	P.	47.3	36.4	30.1	4.5	55.8	47.0	21.5	15.3	4.3	27 55.80	− 5.20	. .	− 5.35	14 27 45.25	+ 0.02
	40	B. A. C. 853	P.	24.2	27.5	29.5	37.6	40.3	43.1	51.1	53.1	56.7	38 40.37	− 1.78	. .	− 5.35	2 38 33.24	− 3.98
	41	B. A. C. 873	P.	25.3	28.6	30.4	37.9	40.3	43.0	50.6	52.5	55.7	42 40.48	− 1.64	. .	− 5.35	2 42 33.49	− 3.89
	42	B. A. C. 879	P.	47.9	51.0	52.8	0.0	2.4	4.8	12.1	14.0	17.0	44 2.44	− 1.56	. .	− 5.35	2 43 55.43	− 3.85
	43	β Ursæ Minoris, S.P.	P.	58.5	48.9	42.9	19.7	11.8	3.8	41.1	35.5	25.9	51 12.01	− 4.76	. .	− 5.35	14 51 1.90	+ 0.01
	44	Moon I, N.	P.	58.2	0.9	2.5	9.2	11.4	13.7	20.4	22.0	24.9	55 11.47	− 0.56	. .	− 5.35	2 55 5.56	+74.29
	45	B. A. C. 1009	P.	2.1	5.4	7.3	15.4	18.0	20.6	28.4	30.3	33.6	9 17.90	− 1.72	. .	− 5.35	3 9 10.83	− 3.85
	46	B. A. C. 1037	P.	54.7	57.4	59.0	5.7	7.9	10.2	16.7	18.3	21.0	14 7.88	− 1.32	. .	− 5.35	3 14 1.21	− 3.73
	47	γ Ursæ Minoris, S.P.	P.	. .	. .	. .	. .	. .	. .	35.8	30.8	22.4	21 2.67	− 4.22	. .	− 5.36	15 20 53.09	− 0.16
	48	Clotho	P.	53.3	56.0	57.5	3.4	5.6	7.7	13.6	15.3	17.7	22 5.57	− 0.98	. .	− 5.35	3 21 59.24	. .
	49	Egeria	P.	56.0	58.7	0.4	7.1	9.4	11.6	18.4	19.9	22.6	26 9.34	− 0.48	. .	− 5.35	3 26 3.53	. .
	50	B. A. C. 1121	P.	59.4	2.3	4.0	11.0	13.5	15.9	23.0	24.7	27.7	32 13.50	− 1.50	. .	− 5.35	3 32 6.65	− 3.71

2, 8, 14, 18, 24. Bisections at wires II and III.
3, 15, 17, 25, 36. Bisections at wires V and VI.
6, 19, 37, 39, 43, 47. Bisections at sets B and D.
21, 26, 48, 49. Wire A used.
22, 27, 35. Wire B used.
44. Bisections at wires II-VI.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° '	r. "	"	"	"							"	° ' "	°	' "	° ' "	"
1	29 30	10 0.3	26.5	6.0	1.3	31	540	535	. .	585	605	31.7	29 34 41.7	51.1	+ 33.0	80 41 35.9	+ 3.2
2	218 8	3.1	29.8	9.0	2.6	30	480	535	. .	. .	. .	31.7	214 12 54.4	. .	+ 39.6	16 52 47.2	− 4.3
3	325 44	0.6	27.5	7.2	3.0	37	. .	. .	. .	345	400	31.7	325 47 12.5	. .	− 39.6	16 52 54.1	+ 2.6
4	140 8	9 29.6	28.0	6.2	2.9	34	835	830	. .	. .	. .	31.7	140 11 50.6	. .	− 48.5	90 55 19.1	− 0.6
5	39 44	27.0	23.0	4.3	29.6	33	. .	. .	. .	640	665	31.7	39 48 12.6	. .	+ 48.5	90 55 22.3	+ 2.6
6	132 40	27.3	24.3	3.5	0.4	37	120	. .	. .	. .	. .	31.7	132 43 18.6	. .	− 1 3.1	98 24 5.7	+ 1.1
7	47 12	28.3	25.9	5.0	0.5	31	. .	. .	. .	. .	585	31.7	47 16 42.7	. .	+ 1 3.1	98 24 7.0	+ 2.4
8	141 48	29.2	28.0	6.5	3.1	34	120	145	. .	. .	. .	31.7	141 52 1.5	. .	− 45.8	89 15 5.5	− 0.2
9	38 4	29.0	24.9	5.3	29.7	34	. .	. .	. .	365	380	31.7	38 8 0.3	. .	+ 45.8	89 15 7.3	+ 1.6
10	140 18	10 0.0	27.7	6.6	3.7	35	080	115	. .	. .	. .	31.7	140 21 46.3	. .	− 48.4	90 45 23.3	0.0
11	39 34	0.8	26.1	6.9	0.9	33	. .	. .	. .	315	320	31.7	39 38 15.0	. .	+ 48.4	90 45 24.6	+ 1.3
12	151 14	0.4	27.6	5.4	1.5	34	. .	. .	310	. .	. .	31.7	151 17 59.4	. .	− 32.0	79 48 53.8	+ 1.1
13	28 38	0.9	27.6	7.4	2.3	34	. .	. .	. .	. .	100	31.7	28 42 2.3	. .	+ 32.0	79 48 55.5	+ 2.8
14	206 24	3.7	29.5	7.4	1.4	30	140	190	. .	. .	. .	31.7	206 39 0.5	. .	+ 29.3	24 26 51.4	− 1.8
15	333 18	0.6	27.0	6.1	2.6	38	. .	. .	. .	060	050	31.7	333 21 2.4	48.8	− 29.3	24 26 54.3	+ 1.1
16	208 28	3.5	1.0	9.2	2.6	33	. .	635	695	. .	. .	31.7	208 32 5.9	. .	+ 31.8	22 33 43.5	− 5.4
17	331 24	9 29.0	26.0	5.6	1.8	34	. .	. .	. .	335	355	31.7	331 28 0.2	48.3	− 31.8	22 33 49.6	+ 0.7
18	217 58	10 2.0	29.2	8.0	1.7	33	035	115	. .	. .	. .	31.7	218 2 15.7	. .	+ 45.7	13 3 19.8	− 2.2
19	321 54	0.0	26.7	5.2	2.1	35	. .	. .	. .	070	055	31.7	321 57 48.5	. .	− 45.7	13 3 24.0	+ 2.0
20	69 12	9 29.7	24.2	4.2	0.4	34	615	635	. .	. .	. .	31.7	69 15 55.6	. .	+ 2 33.5	120 24 50.3	+12.4
21	42 0	28.1	23.2	4.2	29.1	32	185	175	. .	. .	. .	31.7	42 7 7.2	. .	+ 52.9	93 14 21.3	+20.5
22	42 0	28.1	23.2	4.2	29.1	36	. .	. .	. .	010	000	31.7	42 1 3.6	. .	+ 52.7	93 8 17.5	+20.5
23	79 48	10 2.1	28.0	5.8	2.6	32	. .	. .	. .	855	810	31.7	79 52 21.0	. .	+ 5 17.0	131 3 59.2	+10.1
24	196 54	1.1	29.5	7.8	1.2	35	275	290	. .	. .	. .	31.7	196 57 42.9	. .	+ 17.9	34 8 20.4	− 2.9
25	342 58	1.6	28.3	7.6	3.1	32	. .	. .	. .	785	830	31.7	343 2 21.5	47.3	− 17.9	34 8 24.8	+ 1.5
26	148 12	1.0	27.4	7.0	2.6	27	. .	145	. .	. .	. .	31.7	148 20 21.0	. .	− 36.2	82 46 36.4	+ 1.4
27	31 6	9 29.9	27.4	6.5	1.2	25	. .	. .	. .	. .	560	31.7	31 39 41.2	. .	+ 36.2	82 46 38.6	+ 3.6
28	49 38	10 1.2	27.7	6.1	1.9	30	685	690	. .	. .	. .	31.7	49 42 53.8	. .	+ 1 9 2	100 50 24.2	+20.8
29	74 38	1.2	26.4	5.2	1.5	33	. .	990	. .	005	. .	31.7	74 42 4.1	. .	+ 3 31.6	125 51 56.9	+15.4
30	310 12	0.7	27.7	5.9	2.5	35	200	140	145	170	185	31.7	310 15 46.0	. .	− 1 9.3	1 20 57.9	+ 1.1
31	71 14	1.1	26.3	5.1	0.8	33	. .	360	. .	310	. .	31.7	71 18 14.6	. .	+ 2 52.1	122 27 27.9	+16.8
32	69 20	0.8	25.6	4.9	1.0	37	. .	375	. .	380	. .	31.7	69 23 12.9	45.2	+ 2 35.2	120 32 9.3	+17.4
33	79 12	2.3	27.8	5.8	2.6	35	490	485	. .	. .	. .	31.7	79 15 39.7	. .	+ 5 1.1	130 27 2.0	+16.8
34	77 58	1.0	26.5	5.1	1.7	35	665	695	. .	. .	. .	31.7	78 1 37.8	. .	+ 4 31.0	129 12 30.0	+17.2
35	28 38	2.6	29.1	9.1	3.8	30	190	175	. .	. .	. .	31.7	28 40 27.0	44.6	+ 32.2	79 47 20.4	+25.0
36	28 38	2.6	29.1	9.1	3.8	31	. .	. .	. .	160	145	31.7	28 42 45.6	. .	+ 32.3	79 49 39.1	. .
37	283 52	1.0	27.0	7.0	3.9	35	750	860	. .	. .	. .	31.7	283 55 35.3	. .	− 3 53.2	334 58 3.3	+ 2.8
38	30 34	3.3	0.0	9.1	3.8	37	570	575	. .	575	590	31.7	30 37 6.6	44.9	+ 34.8	81 44 2.6	+ 0.9
39	295 6	3.4	0.2	8.6	4.6	32	195	. .	280	. .	300	31.7	295 10 27.6	. .	− 2 4.6	346 14 44.2	+ 2.1
40	79 48	2.7	28.5	6.8	3.4	35	475	565	. .	. .	. .	31.7	79 51 38.5	44.9	+ 5 18.1	131 3 17.8	+19.1
41	74 50	9 29.0	23.9	4.0	29.1	33	895	920	. .	. .	. .	31.7	74 54 7.1	. .	+ 3 34.8	126 4 3.1	+19.8
42	71 42	27.8	24.0	3.8	29.0	33	. .	235	. .	285	. .	31.7	71 46 17.9	. .	+ 2 56.9	122 55 36.0	+20.2
43	293 32	27.9	26.3	4.9	1.3	36	195	. .	205	. .	150	31.7	293 35 31.7	. .	− 2 14.0	344 39 38.9	+ 1.5
44	18 38	10 1.3	29.3	9.3	2.5	35	755	930	205	395	565	31.7	18 41 29.1	. .	+ 19.9	69 48 10.2	. .
45	78 2	1.7	27.1	5.0	2.5	37	. .	135	. .	145	. .	31.7	78 5 15.5	. .	+ 4 32.4	129 16 9.1	+20.4
46	61 0	9 29.5	25.9	5.2	1.4	32	805	865	. .	. .	. .	31.7	61 4 22.5	. .	+ 1 46.3	112 12 30.0	+21.6
47	291 8	10 3.0	0.8	8.3	4.5	31	. .	. .	. .	570	605	31.7	291 12 38.1	. .	− 2 30.8	342 16 28.5	+ 0.8
48	42 18	9 29.8	26.0	5.9	1.5	35	. .	. .	. .	550	545	31.7	42 24 14.0	. .	+ 53.8	93 31 29.0	− 5.7
49	15 0	10 2.1	29.9	10.0	4.1	41	. .	. .	. .	215	225	31.7	15 4 44.2	. .	+ 15.9	66 11 21.3	− 1.5
50	69 2	0.9	26.6	5.8	1.4	37	060	070	. .	. .	. .	31.7	69 5 16.6	. .	+ 2 33.1	120 14 10.9	+21.4

No.	Barom.	At. Ther.
	in.	°
1	30.04	53.0
15	30.02	51.1
17	30.01	50.7
25	30.01	49.4
32	30.00	48.0
35	29.99	47.7
38	29.99	47.4
40	29.98	47.1

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
35	− 0.1	. .	. .	− 0.1
44	−19 23.5	+ 16 41.7	. .	− 2 41.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s	s.	h. m. s.	s.
1875. Nov. 12	1	Pomona . . .	P.	47.4	49.9	51.5	. .	. .	. .	8.7	10.4	13.0	41 0.15	− 0.60	. .	− 5.35	3 40 54.20	. .
	2	ζ Ursæ Minoris, S. P.	P.	38.5	25.7	18.2	48.5	38.4	28.4	58.5	51.4	38.7	48 38.48	− 5.84	. .	− 5.36	15 48 27.28	+ 0.06
	3	B. A. C. 1236 . .	P.	59.3	1.2	6.5	9.2	11.7	14.4	17.2	22.3	24.0	52 11.76	− 1.72	. .	− 5.35	3 52 4.69	− 3.68
	4	B. A. C. 1373 . .	P.	32.5	35.4	37.0	43.6	45.8	47.9	54.6	56.1	59.0	20 45.77	− 0.53	. .	− 5.34	4 20 39.90	− 4.14
	5	B. A. C. 1388 . .	P.	55.3	58.0	59.6	6.0	8.1	10.3	16.8	18.4	21.2	23 8.19	− 0.56	. .	− 5.34	4 23 2.29	− 4.10
	6	A Draconis, S. P. .	P.	54.0	47.0	42.7	25.7	19.9	14.3	37.0	52.9	45.4	28 19.88	− 3.69	. .	− 5.36	16 28 10.83	− 0.33
	7	ε Ursæ Minoris, S.P.	P.	. .	. .	. .	. .	36.0	21.0	50.5	39.5	21.0	58 51.23	− 8.34	. .	− 5.36	16 58 37.53	− 0.32
	8	Lutetia	P.	. .	. .	. .	38.0	40.4	42.5	46.9	48.7	51.2	59 38.11	− 0.56	. .	− 5.34	4 59 32.21	. .
	9	B. A. C. 1633 . .	P.	58.8	2.0	3.9	11.3	13.9	16.5	24.0	26.0	29.0	10 13.93	− 1.77	. .	− 5.34	5 10 6.82	− 3.29
	10	B. A. C. 1644 . .	P.	44.3	47.3	49.1	56.6	59.0	1.5	9.9	10.6	13.7	11 59.11	− 1.61	. .	− 5.34	5 11 52.16	− 3.29
	11	B. A. C. 1693 . .	P.	10.9	14.2	16.2	24.0	26.7	29.5	37.5	39.6	42.9	19 26.83	− 1.78	. .	− 5.34	5 19 19.71	− 3.21
	12	B. A. C. 1719 . .	P.	58.9	2.3	4.3	12.3	15.0	17.9	26.0	27.9	31.3	23 15.10	− 1.81	. .	− 5.34	5 23 7.95	− 3.18
	13	B. A. C. 1739 . .	P.	41.7	44.8	46.6	51.6	54.2	56.7	59.2	1.8	. .	26 56.70	− 1.66	. .	− 5.34	5 26 49.70	− 3.19
	14	B. A. C. 1753 . .	P.	34.3	37.4	39.2	46.7	49.3	51.8	59.4	1.0	4.3	28 49.27	− 1.65	. .	− 5.34	5 28 42.28	− 3.19
	15	B. A. C. 1771 . .	P.	35.0	37.9	39.8	47.1	49.5	51.9	59.3	1.0	4.1	30 49.51	− 1.60	. .	− 5.34	5 30 42.57	− 3.19
	16	ω Draconis, S. P. .	P.	20.8	13.7	9.5	52.4	46.8	41.0	24.4	20.0	13.1	38 46.86	− 3.56	. .	− 5.37	17 37 38.03	+ 0.18
	17	B. A. C. 1841 . .	P.	16.9	19.9	21.7	28.9	31.4	33.7	41.0	42.8	45.8	41 31.34	− 1.58	. .	− 5.34	5 41 24.42	− 3.14
	18	ψ^1 Draconis, S. P. .	P.	. .	. .	28.3	22.0	15.0	8.4	1.7	. .	. .	44 15.08	− 4.10	. .	− 5.37	17 44 5.61	+ 0.08
	19	B. A. C. 1882 . .	P.	33.4	36.3	38.0	45.1	47.5	49.7	56.8	58.5	1.4	48 47.41	− 0.40	. .	− 5.34	5 48 41.67	− 4.30
	20	B. A. C. 1925 . .	P.	5.5	8.2	9.8	16.4	18.7	20.9	27.5	29.0	31.9	54 18.66	− 0.54	. .	− 5.34	5 54 12.78	− 4.07
	21	B. A. C. 1930 . .	P.	36.8	39.7	41.3	47.6	49.8	52.0	58.4	0.0	2.6	55 49.80	− 0.63	. .	− 5.34	5 55 43.83	− 3.93
	22	B. A. C. 1989 . .	P.	47.9	50.5	52.2	58.5	0.6	2.8	9.0	10.7	13.4	5 0.62	− 0.66	. .	− 5.34	6 4 54.62	− 3.87
	23	B. A. C. 2016 . .	P.	17.7	20.4	22.2	28.9	31.1	33.5	40.0	41.6	44.5	9 31.10	− 0.51	. .	− 5.34	6 9 25.25	− 4.07
	24	δ Ursæ Minoris, S. P.	P.	. .	. .	39.0	4.5	29.5	55.0	. .	. .	. .	12 29.66	−18.00	. .	− 5.37	18 12 6.29	+ 0.13
	25	μ Geminorum . .	P.	20.5	23.3	24.9	31.5	33.7	36.0	42.6	44.1	47.0	15 33.73	− 0.54	− 5.28	− 5.37	6 15 27.82	− 0.13
	26	γ Geminorum . .	P.	26.4	29.0	30.7	36.9	39.1	41.3	47.7	49.3	51.9	30 39.14	− 0.66	− 5.25	− 5.37	6 30 33.11	− 0.15
	27	α Canis Majoris. .	P.	35.4	38.0	39.6	45.9	48.0	50.2	56.5	58.1	0.8	39 48.06	− 1.25	− 5.56	− 5.37	6 39 41.44	+ 0.11
	28	51 Cephei	P.	. .	. .	. .	. .	. .	27.0	10.0	. .	. .	41 44.84	+19.92	. .	− 5.37	6 41 59.39	− 0.04
	29	ε Canis Majoris. .	P.	38.6	41.4	43.0	50.0	52.5	54.8	1.9	3.5	6.5	53 52.47	− 1.49	− 5.37	− 5.37	6 53 45.61	− 0.05
	30	B. A. C. 2313 . .	P.	43.3	46.0	47.6	54.5	56.6	58.8	5.5	7.0	9.8	57 56.57	− 0.53	. .	− 5.34	6 57 50.70	− 3.87
	31	B. A. C. 2322 . .	P.	45.5	48.1	49.7	55.9	58.0	0.1	6.2	7.7	10.3	58 57.94	− 0.79	. .	− 5.34	6 58 51.81	− 3.50
	32	δ Canis Majoris. .	P.	14.6	17.4	19.1	25.8	28.0	30.4	37.3	38.9	41.8	3 28.14	− 1.44	− 5.38	− 5.37	7 3 21.33	− 0.04
	33	B. A. C. 2364 . .	P.	59.5	2.2	3.8	10.7	12.8	15.2	21.8	23.6	26.5	7 12.90	− 0.48	. .	− 5.34	7 7 7.08	− 3.90
	34	δ Geminorum . .	P.	35.8	38.5	40.1	46.8	48.9	51.2	57.8	59.4	2.3	12 48.98	− 0.55	− 5.28	− 5.38	7 12 43.05	− 0.16
	35	B. A. C. 2444 . .	P.	. .	6.9	9.0	11.2	13.3	15.3	19.5	21.0	23.5	18 11.11	− 0.74	. .	− 5.34	7 18 5.03	− 3.47
	36	Polaris, S. P. . .	F.	10.5	. .	. .	. .	. .	. .	. .	. .	. .	14 29.57	−45.73	. .	− 5.49	1 13 38.35	− 0.47
	37	η Ursæ Majoris . .	F.	23.6	27.5	30.0	39.5	42.8	45.9	55.4	57.7	1.8	42 42.69	+ 0.33	. .	− 5.49	13 42 37.53	− 0.07
	38	η Bootis	F.	41.0	42.6	46.9	49.0	51.2	53.3	55.6	59.9	1.4	48 51.21	− 0.56	− 5.45	− 5.49	13 48 45.16	− 0.09
	39	α Bootis	F.	51.6	54.3	56.0	2.4	4.6	6.8	13.3	15.0	17.8	10 4.64	− 0.55	− 5.40	− 5.49	14 9 58.60	− 0.09
	40	θ Bootis	F.	41.7	45.9	48.4	58.6	2.0	5.2	15.2	17.6	21.9	21 1.83	+ 0.54	. .	− 5.49	14 20 56.88	+ 0.21
	41	B. A. C. 4812 .	F.	53.4	56.8	58.5	6.5	9.1	11.8	19.6	21.5	24.9	27 9.12	− 0.08	. .	− 5.45	14 27 3.59	− 0.72
	42	5 Ursæ Minoris . .	F.	. .	. .	. .	. .	. .	4.3	21.4	28.0	38.6	27 46.92	+ 3.38	. .	− 5.49	14 27 44.81	− 0.43
	43	ε Bootis	F.	24.6	27.6	29.2	36.1	38.5	40.8	47.6	49.4	52.3	39 38.46	− 0.37	− 5.49	− 5.49	14 39 32.60	− 0.02
	44	β Ursæ Minoris. .	F.	. .	. .	. .	. .	. .	19.4	35.4	41.0	50.5	51 4.01	+ 2.92	. .	− 5.49	14 51 1.44	− 0.46
13	45	Sun I, S. . . .	F.	45.4	48.0	49.7	56.1	58.2	0.5	6.9	8.5	11.2	12 58.28	− 1.22	. .	− 5.46	15 12 51.60	. .
	46	Sun II, N. . . .	F.	2.0	4.8	6.3	12.8	14.9	17.0	23.6	25.1	27.8	15 14.92	− 1.22	. .	− 5.46	15 15 8.24	. .
	47	B. A. C. 7226 . .	F.	. .	. .	. .	. .	. .	. .	. .	34.3	37.4	44 22.68	− 1.56	. .	− 5.52	20 44 15.60	− 2.94
	48	61^1 Cygni	F.	. .	. .	. .	24.8	27.5	30.0	35.2	37.8	40.5	1 24.84	− 0.12	− 5.41	− 5.49	21 1 19.23	− 0.12
	49	α Cephei (R.) . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	50	ε Pegasi	F.	59.0	1.6	3.0	9.3	11.4	13.4	19.6	21.2	23.8	38 11.37	− 0.76	− 5.46	− 5.49	21 38 5.12	− 0.02

1, 8. Wire A used.

2, 6, 7, 16, 18, 36, 42, 44. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° '	r. "	"	"	"							"	° ' "	°	' "	° ' "	"
1	21 18	10 1.5	29.8	9.0	2.8	40	. .	235	. .	270	. .	31.7	21 22 59.4	43.8	+ 23.1	72 29 43.7	− 1.8
2	297 2	1.4	28.6	7.9	3.8	34	080	. .	145	. .	125	31.7	297 6 0.4	. .	− 1 54.8	348 10 26.8	− 0.3
3	78 4	0.6	25.9	4.4	1.2	33	. .	370	. .	360	. .	31.7	78 8 14.3	43.6	+ 4 33.9	129 19 9.4	+21.3
4	17 28	1.8	29.4	8.6	2.5	31	400	395	. .	. .	. .	31.7	17 32 42.0	. .	+ 18.7	68 39 21.9	+18.2
5	19 16	4.6	2.0	11.9	6.1	37	655	615	. .	. .	. .	31.7	19 19 3.4	. .	+ 20.7	70 25 45.3	+18.2
6	287 54	1.6	28.0	5.9	3.7	31	000	. .	045	. .	010	31.7	287 58 48.6	42.8	− 3 0.1	339 2 9.7	− 0.8
7	301 6	6.1	2.8	11.1	7.2	35	. .	. .	. .	595	575	31.7	301 9 34.0	. .	− 1 37.4	352 14 17.8	0.0
8	17 20	1.7	29.0	8.3	2.5	37	. .	. .	. .	360	395	31.7	17 25 44.2	. .	+ 18.6	68 32 24.0	− 1.8
9	74 54	1.0	25.8	4.9	1.2	38	215	210	. .	. .	. .	31.7	74 56 59.4	. .	+ 3 36.5	126 6 57.1	+21.3
10	72 28	1.5	27.6	6.0	2.6	39	. .	090	. .	115	. .	31.7	72 30 45.1	. .	+ 3 5.6	123 40 11.9	+21.1
11	78 32	3.9	29.6	6.5	4.0	33	155	130	. .	. .	. .	31.7	78 36 14.3	. .	+ 4 45.6	129 47 21.1	+21.4
12	79 48	2.1	27.5	5.3	2.4	37	455	500	. .	. .	. .	31.7	79 51 9.5	. .	+ 5 20.1	131 2 50.7	+21.4
13	74 20	0.6	25.6	4.9	0.5	35	885	850	. .	. .	. .	31.7	74 23 35.7	. .	+ 3 28.7	125 33 25.6	+21.0
14	74 0	0.4	25.0	4.2	1.6	36	. .	250	. .	310	. .	31.7	74 3 29.9	. .	+ 3 24.3	125 13 15.4	+20.9
15	71 56	0.5	25.7	5.8	2.2	33	320	325	. .	. .	. .	31.7	72 0 14.0	. .	+ 3 0.3	123 9 35.5	+20.7
16	287 42	1.9	28.5	7.4	4.6	35	525	. .	565	. .	535	31.7	287 45 38.5	. .	− 3 2.8	338 48 56.9	+ 1.7
17	71 8	3.2	28.0	7.2	4.2	35	030	070	. .	. .	. .	31.7	71 11 45.5	. .	+ 2 52.1	122 20 58.8	+20.3
18	291 4	1.2	27.3	5.8	2.5	31	140	160	185	. .	. .	31.7	291 8 47.0	. .	− 2 31.9	342 12 36.3	− 0.1
19	9 54	9 29.0	27.1	6.9	1.4	33	805	765	. .	. .	. .	31.7	9 58 7.5	. .	+ 10.4	61 4 39.1	+ 8.9
20	16 26	10 1.5	29.1	9.4	3.1	36	140	160	. .	. .	. .	31.7	16 29 29.1	. .	+ 17.5	67 36 7.8	+ 9.8
21	21 10	2.6	29.9	9.1	3.4	36	990	020	. .	. .	. .	31.7	21 13 15.5	. .	+ 23.0	72 19 59.7	+10.7
22	22 40	0.1	27.0	7.0	1.5	35	530	555	. .	550	565	31.7	22 43 40.4	41.5	+ 24.8	73 50 26.4	+10.2
23	15 2	0.2	28.0	7.0	2.0	32	750	735	. .	. .	. .	31.7	15 6 22.8	. .	+ 16.0	66 13 0.0	+ 8.0
24	305 28	2.5	29.3	7.6	5.2	35	760	780	740	755	. .	31.7	305 31 34.7	. .	− 1 22.8	356 36 33.1	+ 0.7
25	16 14	2.6	29.5	9.9	3.6	31	400	330	. .	385	420	31.7	16 18 41.8	. .	+ 17.4	67 25 20.4	+ 0.8
26	22 18	3.5	29.5	9.9	4.1	30	560	610	. .	590	630	31.7	22 22 53.4	. .	+ 24.5	73 29 39 1	+ 1.9
27	55 20	9 29.4	25.0	4.5	1.6	31	355	360	. .	365	365	31.7	55 24 45.5	38.8	+ 1 26.2	106 32 32.9	− 0.6
28	311 36	10 2.9	29.2	7.6	4.9	30	. .	. .	. .	800	820	31.7	311 40 50.7	. .	− 1 6.8	2 46 5.1	+ 1.2
29	67 36	3.1	27.9	7.2	4.6	37	455	490	. .	. .	515	31.7	67 39 8.4	. .	+ 2 24.2	118 47 53.8	− 1.0
30	16 0	2.3	0.1	10.0	4.1	34	235	255	. .	. .	. .	31.7	16 3 57.4	. .	+ 17.2	67 10 35.8	+ 3.4
31	29 26	2.8	28.3	7.3	3.8	31	. .	. .	. .	890	935	31.7	29 30 34.7	. .	+ 33.8	80 37 29.7	+ 7.2
32	65 0	9 29.3	23.5	3.9	0.3	38	. .	340	. .	. .	. .	31.7	65 2 59.3	. .	+ 2 7.7	116 11 28.2	− 0.2
33	13 44	10 1.2	27.2	8.5	2.5	36	715	700	. .	. .	. .	31.7	13 47 21.5	. .	+ 14.7	64 53 57.4	+ 1.8
34	16 36	1.8	28.6	7.7	3.2	31	475	490	. .	515	500	31.7	16 40 41.1	. .	+ 17.9	67 47 20.2	+ 0.9
35	26 54	1.0	27.4	7.0	2.0	32	. .	. .	. .	975	980	31.7	26 58 19.6	36.6	+ 30.4	78 5 11.2	+ 4.7
36	307 30	0.8	27.0	6.5	4.7	33	986	. .	. .	. .	. .	31.4	307 33 59.5	45.3	− 1 16.4	358 39 4.3	+ 0.9
37	348 54	9 26.9	22.8	3.2	29.8	34	. .	650	. .	664	. .	31.4	348 57 57.2	. .	− 11.4	40 4 7.0	+ 0.7
38	19 48	29.4	25.8	7.5	1.3	34	. .	008	. .	024	. .	31.4	19 52 3.9	. .	+ 21.1	70 58 46.2	+ 1.0
39	19 0	10 3.9	0.7	12.0	6.2	35	. .	694	. .	704	. .	31.4	19 3 33.4	. .	+ 20.1	70 10 14.7	+ 1.0
40	346 24	9 26.5	25.0	3.5	29.8	32	. .	550	. .	572	. .	31.4	346 28 28.8	. .	− 14.0	37 34 36.0	+ 1.2
41	359 58	28.0	25.9	6.9	0.7	31	890	870	. .	. .	. .	31.4	0 2 37.2	. .	0.0	51 8 58.4	−17.9
42	322 36	27.0	24.3	3.5	1.9	35	. .	. .	. .	620	610	31.4	322 39 41.5	. .	− 44.2	13 45 18.5	+ 0.4
43	11 14	27.2	23.9	5.6	29.9	35	. .	822	. .	844	. .	31.4	11 17 38.0	. .	+ 11.6	62 24 10.8	+ 3.8
44	324 10	17.2	13.0	22.5	23.1	32	. .	. .	. .	130	106	31.4	324 14 45.2	. .	− 41.6	15 20 24.8	+ 2.0
45	57 4	23.5	19.4	2.1	28.4	31	838	870	. .	. .	. .	31.4	57 8 41.9	56.0	+ 1 28.8	108 16 31.9	. .
46	56 32	29.5	26.7	7.5	1.2	32	. .	. .	. .	778	788	31.4	56 36 22.3	. .	+ 1 27.0	107 44 10.5	. .
47	72 26	11 13.5	7.9	15.5	12.9	33	. .	. .	. .	920	920	28.9	72 29 21.3	57.4	+ 2 59.3	123 38 41.8	− 2.6
48	0 42	9 29.3	26.3	5.5	1.2	37	. .	. .	. .	682	696	28.9	0 45 6.3	. .	+ 0.8	51 51 28.3	+ 1.7
49	203 6	28.1	25.7	4.0	27.9	35	. .	. .	. .	180	178	28.9	203 9 44.9	. .	+ 24.5	27 56 11.8	− 0.5
50	29 30	28.5	24.2	4.5	29.0	31	. .	558	. .	562	. .	28.9	29 34 40.9	. .	+ 32.6	80 41 34.7	+ 2.0

No.	Barom.	At. Ther.
	in.	°
1	29.97	46.2
3	29.98	46.0
6	29.96	45.3
22	29.97	43.9
27	29.97	42.1
35	29.96	40.5
36	30.00	45.3
45	29.96	52.3
47	29.90	58.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
45	− 7.5	− 16 10.7	. .	− 16 18.2
46	− 7.5	+ 16 10.7	. .	+ 16 3.2

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Nov. 13	1	11 Cephei	F.	. .	. .	55.4	1.6	7.6	14.1	20.4	. .	. .	40 7.82	+ 2.00	. .	− 5.49	21 40 4.33	− 0.19
	2	μ Capricorni	F.	. .	. .	. .	. .	. .	. .	46.8	48.4	51.0	46 38.38	− 1.16	− 5.57	− 5.49	21 46 31.73	+ 0.11
	3	α Aquarii	F.	18.7	21.3	22.7	28.9	30.9	33.0	39.1	40.7	43.1	59 30.93	− 0.93	− 5.56	− 5.49	21 59 24.51	+ 0.10
	4	B. A. C. 7702	F.	2.4	5.4	7.2	14.6	17.2	19.8	27.2	29.0	32.1	1 17.21	− 1.58	. .	− 5.53	22 1 10.10	− 3.40
	5	Lacaille 9036	F.	33.0	36.1	38.0	45.4	47.9	50.4	57.9	59.8	2.8	2 47.92	− 1.58	. .	− 5.53	22 2 40.81	− 3.40
	6	η Aquarii (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	7	η Aquarii	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	8	α Pegasi	F.	28.6	31.2	32.6	39.0	41.1	43.1	49.5	51.2	53.8	58 41.12	− 0.66	− 5.58	− 5.49	22 58 34.97	+ 0.12
14	9	ι Aurigæ	Sk.	46.9	50.0	51.7	59.0	1.4	3.9	11.2	13.0	16.0	49 1.46	− 0.45	− 5.20	− 5.24	4 48 55.77	− 0.08
	10	Moon II, N.	Sk.	0.4	3.4	5.2	12.3	14.7	17.1	24.2	25.9	29.1	13 14.70	− 0.57	. .	− 5.22	5 13 8.91	−79.22
	11	β Tauri	Sk.	19.7	22.6	24.2	31.3	33.7	35.9	42.9	44.5	47.5	18 33.59	− 0.56	− 5.21	− 5.25	5 18 27.78	− 0.06
	12	δ Orionis	Sk.	35.0	37.6	39.2	45.2	47.2	49.3	55.5	57.1	59.6	25 47.30	− 1.11	− 5.25	− 5.25	5 25 40.94	− 0.03
	13	B. A. C. 1831	Sk.	5.9	8.4	10.0	16.0	18.1	20.1	26.2	27.8	30.4	40 18.10	− 1.09	. .	− 5.22	5 40 11.79	− 3.66
	14	B. A. C. 1845	Sk.	47.5	49.4	54.7	57.3	0.1	2.5	5.2	10.3	12.4	42 59.93	− 0.29	. .	− 5.22	5 42 54.42	− 4.80
	15	B. A. C. 1896	Sk.	10.8	13.6	15.3	22.2	24.4	26.6	33.4	35.0	37.9	50 24.36	− 0.62	. .	− 5.22	5 50 18.52	− 4.24
	16	B. A. C. 1907	Sk.	48.7	51.4	53.0	59.2	1.2	3.3	9.4	11.0	13.7	52 1.21	− 0.88	. .	− 5.22	5 51 55.11	− 3.85
	17	B. A. C. 2016	Sk.	17.8	20.7	22.4	28.9	31.2	33.4	40.1	41.7	44.6	9 31.20	− 0.66	. .	− 5.22	6 9 25.32	− 4.13
	18	δ Ursæ Minoris, S.P.	Sk.	. .	. .	37.5	3.5	29.0	54.5	. .	. .	. .	12 28.79	−18.24	. .	− 5.25	18 12 5.30	− 0.15
	19	Lalande 12661	Sk.	23.5	26.4	28.0	35.0	37.4	39.6	46.6	48.3	51.4	30 37.36	− 0.55	. .	− 5.22	6 30 31.59	− 4.25
	20	B. A. C. 2238	Sk.	21.1	24.4	25.7	32.3	34.5	36.7	43.4	45.0	47.8	44 34.54	− 0.68	. .	− 5.22	6 44 28.64	− 4.01
	21	B. A. C. 2285	Sk.	1.8	4.6	6.0	12.4	14.5	16.7	23.0	24.6	27.1	53 14.52	− 0.81	. .	− 5.22	6 53 8.49	− 3.76
	22	B. A. C. 2322	Sk.	45.6	48.4	49.8	56.0	58.0	0.1	6.2	7.9	10.4	58 58.04	− 0.94	. .	− 5.22	6 58 51.88	− 3.56
	23	B. A. C. 2340	Sk.	6.7	9.6	11.3	18.4	20.7	23.1	30.1	32.0	35.0	3 20.77	− 0.52	. .	− 5.22	7 3 15.03	− 4.17
	24	B. A. C. 2364	Sk.	59.4	2.3	4.0	10.8	13.0	15.2	22.0	23.6	26.4	7 12.97	− 0.64	. .	− 5.22	7 7 7.11	− 3.96
	25	B. A. C. 2398	Sk.	51.4	54.1	55.7	2.1	4.1	6.2	12.7	14.2	16.9	11 4.16	− 0.80	. .	− 5.22	7 10 58.14	− 3.70
	26	B. A. C. 2434	Sk.	56.6	58.3	2.7	5.0	7.2	9.3	11.5	16.0	17.7	16 7.14	− 0.68	. .	− 5.22	7 16 1.24	− 3.86
	27	B. A. C. 2469	Sk.	57.9	1.0	2.7	9.6	12.0	14.1	21.1	22.8	25.6	22 11.87	− 0.57	. .	− 5.22	7 22 6.08	− 4.00
	28	α^2 Geminorum	Sk.	32.7	35.8	37.5	44.6	47.0	49.4	56.7	58.5	1.5	26 47.08	− 0.47	− 5.22	− 5.25	7 26 41.36	+ 0.21
	29	α Canis Minoris	Sk.	42.7	45.2	46.8	52.8	54.9	57.0	3.2	4.6	7.1	32 54.92	− 1.00	− 5.24	− 5.25	7 32 48.67	− 0.17
	30	β Geminorum	Sk.	35.6	38.5	40.2	47.3	49.5	51.8	58.8	0.5	3.5	37 49.52	− 0.56	− 5.19	− 5.25	7 37 43.71	− 0.09
	31	B. A. C. 2564	Sk.	. .	. .	. .	. .	. .	36.9	41.2	42.8	45.4	39 32.85	− 0.91	. .	− 5.22	7 39 26.72	− 3.41
	32	B. A. C. 2605	Sk.	37.0	39.8	41.4	47.9	50.0	52.1	58.6	0.2	2.8	44 49.98	− 0.75	. .	− 5.22	7 44 44.01	− 3.61
	33	B. A. C. 2632	Sk.	18.6	21.4	23.0	29.5	31.6	33.7	40.5	42.0	44.7	48 31.67	− 0.74	. .	− 5.22	7 48 25.71	− 3.61
	34	B. A. C. 2659	Sk.	34.1	36.7	38.4	44.8	46.9	49.0	55.6	57.1	59.8	53 46.93	− 0.79	. .	− 5.22	7 53 40.92	− 3.51
	35	λ Ursæ Minoris, S.P.	Sk.	42.0	. .	. .	. .	. .	. .	. .	. .	. .	48 41.79	−55.75	. .	− 5.25	19 47 40.79	− 0.35
	36	B. A. C. 2730	Sk.	51.2	54.0	55.7	2.5	4.8	7.1	14.0	15.5	18.3	3 4.79	− 0.62	. .	− 5.22	8 2 58.95	− 3.70
	37	B. A. C. 2788	Sk.	59.8	2.5	4.2	10.7	12.9	15.1	21.7	23.1	25.9	13 12.88	− 0.72	. .	− 5.22	8 13 6.94	− 3.50
	38	B. A. C. 2901	Sk.	59.2	1.8	3.4	9.5	11.6	13.6	19.9	21.3	23.9	31 11.58	− 1.00	. .	− 5.22	8 31 5.36	− 3.02
	39	ε Hydræ	Sk.	6.4	8.9	10.4	16.6	18.6	20.6	26.9	28.4	31.0	40 18.64	− 0.98	− 5.34	− 5.25	8 40 12.41	+ 0.05
	40	B. A. C. 2984	Sk.	40.6	43.7	45.6	52.9	55.5	58.0	5.4	7.2	10.1	42 55.44	− 0.43	. .	− 5.22	8 42 49.79	− 3.70
	41	B. A. C. 3013	Sk.	44.8	47.5	49.1	55.0	57.0	59.4	5.6	7.0	9.6	45 57.22	− 1.00	. .	− 5.22	8 45 51.00	− 2.93
	42	B. A. C. 3027	Sk.	16.6	20.0	21.9	30.1	32.8	35.5	43.6	45.5	49.1	48 32.79	− 0.24	. .	− 5.22	8 48 27.33	− 3.92
	43	B. A. C. 3105	Sk.	20.3	22.8	24.3	30.6	32.6	34.6	40.7	42.3	45.0	59 32.58	− 1.01	. .	− 5.22	8 59 26.35	− 2.85
	44	B. A. C. 3112	Sk.	4.8	8.0	9.8	17.2	19.8	22.4	29.7	31.6	34.7	1 19.78	− 0.42	. .	− 5.22	9 1 14.14	− 3.58
	45	B. A. C. 3146	Sk.	48.5	51.0	52.6	58.7	0.7	2.8	8.9	10.5	13.2	8 0.77	− 1.05	. .	− 5.22	9 7 54.50	− 2.74
	46	B. A. C. 3162^2	Sk.	57.3	0.6	2.5	10.3	12.8	15.5	23.0	25.0	28.3	11 12.81	− 0.34	. .	− 5.22	9 11 7.25	− 3.60
	47	B. A. C. 3178	Sk.	. .	30.3	32.7	35.2	37.7	40.2	45.2	46.9	50.2	13 35.18	− 0.41	. .	− 5.22	9 13 29.55	− 3.50
	48	α Hydræ	Sk.	23.3	25.9	27.3	33.6	35.7	37.8	44.0	45.3	48.0	21 35.66	− 1.24	− 5.31	− 5.25	9 21 29.17	+ 0.03
	49	B. A. C. 3250	Sk.	. .	. .	. .	. .	. .	25.6	30.1	31.4	33.9	25 21.45	− 0.90	. .	− 5.22	9 25 15.33	− 2.82
	50	B. A. C. 3273	Sk.	. .	. .	21.8	24.1	26.6	29.0	31.5	. .	. .	29 26.60	− 0.49	. .	− 5.22	9 29 20.89	− 3.27

1, 10. Bisections at sets B and D.
2. Telescope micrometer reading decreased five revolutions in reduction.
7. Telescope micrometer reading increased one revolution in reduction.
50. Bisections at wires D_2 and D_3.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	328 6	9 28.1	24.2	4.3	1.4	35	. .	712	. .	710	. .	28.9	328 9 37.0	. .	− 35.7	19 15 22.5	+ 0.1
2	52 26	10 2.1	27.7	8.1	1.8	36	. .	. .	. .	778	754	28.9	53 0 34.6	. .	+ 1 16.2	104 8 12.0	+ 1.6
3	39 44	9 27.9	23.0	3.8	28.6	33	516	526	. .	. .	. .	28.9	39 48 11.2	. .	+ 47.9	90 55 20.3	+ 0.6
4	73 24	10 4.2	28.0	6.6	2.6	27	. .	. .	. .	854	892	28.9	73 29 33.5	. .	+ 3 11.6	124 39 6.3	+ 2.6
5	73 24	4.2	28.0	6.6	2.6	33	. .	482	. .	504	. .	28.9	73 28 7.3	54.2	+ 3 11.4	124 37 39.9	+ 2.7
6	140 18	9 27.9	24.3	4.1	1.5	35	078	102	. .	. .	. .	28.9	140 21 46.1	. .	− 47.8	90 45 22.9	− 0.4
7	39 34	22.1	17.0	28.2	23.1	32	. .	. .	. .	724	728	28.9	39 38 14.5	. .	+ 47.8	90 45 23.5	+ 0.2
8	24 18	29.8	25.8	5.9	0.3	38	. .	552	. .	556	. .	28.9	24 20 52.5	. .	+ 26.2	75 27 39.9	+ 3.0
9	5 52	10 2.5	1.1	8.5	2.5	36	. .	444	. .	450	. .	29.8	5 55 22.5	. .	+ 6.0	57 1 49.7	+ 2.2
10	10 52	2.8	1.2	8.9	3.4	38	950	. .	950	. .	030	29.8	10 54 43.2	. .	+ 11.2	62 1 15.6	. .
11	10 20	4.4	3.3	11.5	4.1	36	. .	542	. .	538	. .	29.8	10 23 18.9	46.0	+ 10.6	61 29 50.7	+ 1.4
12	39 12	5.5	2.2	9.2	4.0	33	. .	040	. .	090	. .	29.8	39 16 12.6	. .	+ 47.5	90 23 21.3	+ 0.9
13	37 42	5.5	0.5	10.0	4.3	36	800	790	. .	. .	. .	29.8	37 45 15.3	. .	+ 45.0	88 52 21.5	+15.1
14	359 44	9.9	9.6	17.0	9.5	37	. .	. .	. .	490	484	29.8	359 46 59.3	. .	− 0.2	50 53 20.3	+ 7.6
15	12 54	3.2	2.3	10.5	4.5	37	410	510	. .	. .	. .	29.8	12 57 5.3	. .	+ 13.4	64 3 39.9	+ 9.4
16	26 2	6.3	3.2	11.7	6.0	36	230	540	. .	. .	. .	29.8	26 5 19.9	. .	+ 28.5	77 12 9.6	+12.1
17	15 2	6.1	3.2	11.7	6.0	32	178	232	. .	. .	. .	29.8	15 6 24.1	. .	+ 15.7	66 13 1.0	+ 8.0
18	305 28	1.8	28.5	6.5	3.5	35	. .	860	. .	830	. .	29.8	305 31 32.6	. .	− 1 21.5	356 36 32.3	+ 0.3
19	9 44	3.4	1.4	9.4	2.5	33	722	722	. .	. .	. .	29.8	9 48 3.5	. .	+ 10.1	60 54 34.8	+ 4.5
20	15 4	6.0	3.9	11.7	5.6	32	. .	040	. .	870	. .	29.8	15 8 28.1	. .	+ 15.8	66 15 5.1	+ 4.4
21	22 34	6.7	4.0	11.8	6.3	33	072	100	. .	. .	. .	29.8	22 38 10.1	. .	+ 24.4	73 44 55.7	+ 5.6
22	29 26	8.5	5.0	12.2	7.3	31	328	388	. .	. .	. .	29.8	29 30 35.4	. .	+ 33.1	80 37 29.7	+ 6.9
23	8 22	6.5	3.6	10.1	6.5	31	554	578	. .	. .	. .	29.8	8 26 34.0	. .	+ 8.7	59 33 3.9	+ 0.6
24	13 44	2.8	1.0	9.3	2.5	36	400	410	. .	. .	. .	29.8	13 47 22.7	. .	+ 14.3	64 53 58.2	+ 1.7
25	22 4	3.0	0.9	8.8	3.8	36	410	440	. .	. .	. .	29.8	22 7 22.0	. .	+ 23.8	73 14 7.0	+ 3.7
26	15 38	10.7	8.4	16.4	8.7	32	. .	. .	. .	182	210	29.8	15 42 20.6	. .	+ 16.4	66 48 58.2	+ 1.4
27	10 40	4.0	1.8	10.0	4.6	37	148	200	. .	. .	. .	29.8	10 43 9.7	. .	+ 11.1	61 49 42.0	− 0.7
28	6 40	3.4	1.7	9.4	3.9	34	. .	105	. .	180	. .	29.8	6 43 56.9	. .	+ 6.9	57 50 25.0	+ 0.5
29	33 16	4.2	0.5	8.5	3.8	32	. .	658	. .	624	. .	29.8	33 20 20.0	. .	+ 38.5	84 27 19.7	+ 0.8
30	10 30	6.3	3.6	11.5	7.8	33	970	994	. .	. .	. .	29.8	10 33 56.4	. .	+ 10.9	61 40 28.5	+ 1.1
31	27 44	1.6	8.0	6.1	2.0	30	. .	. .	. .	850	896	29.8	27 48 47.4	. .	+ 30.9	78 55 39.5	+ 2.8
32	19 10	8.7	6.0	14.4	8.8	30	676	704	. .	. .	. .	29.8	19 14 44.5	. .	+ 20.4	70 21 26.1	− 0.3
33	18 36	4.7	2.5	11.6	4.3	31	400	440	. .	. .	. .	29.8	18 40 37.0	. .	+ 19.8	69 47 18.0	− 0.9
34	21 10	6.6	4.0	12.0	6.0	32	552	490	. .	. .	. .	29.8	21 14 18.8	. .	+ 22.8	72 21 2.8	− 0.6
35	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	.	. . . .	. .	. .	. . . .	. .
36	12 56	4.8	1.1	10.0	4.8	32	. .	. .	. .	298	290	29.8	13 0 25.0	. .	+ 13.5	64 6 59.7	− 4.1
37	17 40	5.8	3.4	11.1	5.6	29	960	984	. .	. .	. .	29.8	17 44 58.5	. .	+ 18.8	68 51 38.5	− 3.5
38	32 40	4.3	0.7	8.3	3.0	31	. .	024	. .	140	. .	29.8	32 44 44.1	. .	+ 37.7	83 51 43.0	0.0
39	31 56	4.1	1.2	9.0	3.8	31	934	970	. .	. .	. .	29.8	32 0 30.0	. .	+ 36.7	83 7 27.9	+ 1.6
40	5 4	6.0	3.6	11.5	7.0	31	010	026	. .	. .	. .	29.8	5 8 42.1	. .	+ 5.3	56 15 8.6	−10.4
41	33 0	6.8	5.0	11.1	6.6	31	. .	704	. .	790	. .	29.8	33 4 30.6	. .	+ 38.2	84 11 30.0	− 1.1
42	358 8	6.4	4.0	11.4	7.4	29	. .	. .	. .	140	160	29.8	358 13 11.2	. .	− 1.8	49 19 30.6	−13.1
43	33 14	6.4	3.0	10.0	6.1	35	360	350	. .	. .	. .	29.8	33 17 36.1	. .	+ 38.6	84 24 35.9	− 2.1
44	4 26	2.3	29.8	7.6	2.5	32	. .	. .	. .	290	340	29.8	4 30 26.9	. .	+ 4.6	55 36 52.7	−12.3
45	35 58	2.3	28.0	7.1	2.1	31	932	880	. .	. .	. .	29.8	36 2 32.8	. .	+ 42.7	87 9 36.7	− 1.8
46	1 30	4.4	2.0	12.0	4.8	33	. .	. .	. .	780	790	29.8	1 34 1.7	. .	+ 1.6	52 40 24.5	−14.1
47	3 54	3.5	1.5	9.0	3.5	31	. .	. .	. .	512	516	29.8	3 58 37.8	. .	+ 4.1	55 5 3.1	−13.5
48	46 56	6.6	3.0	11.7	7.2	35	072	110	. .	. .	. .	29.8	46 59 39.2	. .	+ 1 2.9	98 7 3.3	+ 0.7
49	26 58	1.7	28.8	7.4	1.8	33	. .	. .	. .	580	590	29.8	27 2 7.8	. .	+ 30.0	78 8 59.0	− 6.4
50	7 6	5.0	3.2	13.0	6.2	31	. .	. .	. .	800	758	29.8	7 10 30.8	. .	+ 7.4	58 16 59.4	−13.6

No.	Barom.	At. Ther.
	in.	°
5	29.89	56.2
11	29.65	49.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
10	−11 21.5	+ 16 40.8	. .	+ 5 19.3

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Nov. 14	1	B. A. C. 3317 . .	Sk.	. .	. .	17.6	20.0	22.4	24.7	27.0	. .	. .	36 22.34	− 0.52	. .	− 5.22	9 36 16.60	− 3.18
15	2	ε Piscium . . .	D.	25.0	27.6	29.1	35.4	37.4	39.4	45.6	47.0	49.6	56 37.34	− 0.83	− 5.61	. .	. . . .	. .
	3	Polaris	D.	18.5	10.0	13.0	. .	. .	. .	51.0	51.5	41.0	13 0.81	+40.80	. .	. .	. . . .	. .
	4	Polaris	E.	. .	. .	9.0	36.0	1.0	28.5	57.0	. .	. .	13 2.30	+40.80	. .	− 5.64	1 13 38.46	+ 0.35
	5	θ^1 Ceti.	E.	44.6	47.1	48.8	54.9	57.0	59.0	5.2	6.7	9.3	17 56.96	− 1.10	− 5.70	− 5.64	1 17 50.22	+ 0.08
	6	η Piscium . . .	D.	45.0	47.8	49.3	55.5	57.6	59.9	6.0	7.8	10.3	24 57.69	− 0.70	− 5.61	. .	. . . .	. .
	7	β Arietis	E.	41.1	43.8	45.6	52.0	54.1	56.5	2.9	4.5	7.3	47 54.20	− 0.59	− 5.62	− 5.64	1 47 47.97	0.00
	8	Neptune . . .	E.	9.2	11.7	13.4	19.6	21.6	23.7	30.0	31.5	34.2	58 21.66	− 0.78	. .	− 5.63	1 58 15.25	. .
	9	α Arietis	E.	. .	. .	13.4	15.6	17.8	20.0	22.2	. .	. .	0 17.80	− 0.54	− 5.64	− 5.64	2 0 11.62	+ 0.01
	10	ξ^1 Ceti.	D.	. .	. .	30.6	32.8	34.6	36.6	41.0	42.4	44.7	6 32.59	− 0.81	− 5.50	. .	. . . .	. .
	11	Ate	E.	34.0	37.0	38.6	45.0	47.6	49.8	56.7	58.0	1.2	53 47.54	− 0.50	. .	− 5.59	2 53 41.45	. .
	12	48 Cephei	E.	48.9	0.5	7.7	35.1	44.5	53.6	21.5	27.9	40.0	4 44.41	+ 3.40	. .	− 5.65	3 4 42.16	+ 0.10
16	13	12 Canum Venat. .	P.	2.4	5.6	7.7	15.5	18.0	20.7	28.6	30.6	33.9	50 18.11	− 0.06	− 5.81	− 5.65	12 50 12.40	+ 0.16
	14	B. A. C. 4367 . .	P.	52.8	55.5	57.0	3.2	5.3	7.3	13.7	15.3	17.8	56 5.32	− 0.69	. .	− 5.76	12 55 58.87	− 1.59
	15	Polaris, S. P. . .	P.	. .	19.0	51.0	24.0	57.5	30.5	38.0	35.0	44.0	14 24.94	−43.73	. .	− 5.65	1 13 35.56	− 1.94
	16	α Virginis . . .	P.	32.4	34.9	36.6	42.7	44.8	46.9	53.0	54.6	57.2	18 44.79	− 1.09	− 5.70	− 5.66	13 18 38.04	+ 0.02
	17	ζ Virginis . . .	P.	15.3	18.0	19.4	25.5	27.6	29.7	35.6	37.3	39.8	28 27.58	− 0.90	− 5.77	− 5.66	13 28 21.02	+ 0.11
	18	α Draconis . . .	P.	. .	. .	54.9	59.7	4.4	8.9	14.3	. .	. .	1 4.44	+ 1.28	. .	− 5.66	14 1 0.06	+ 0.04
	19	α Bootis	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	20	Mercury II, S. .	P.	2.4	4.9	6.5	12.8	14.9	16.9	23.2	24.8	27.4	17 14.87	− 1.10	. .	− 5.76	14 17 8.01	− 0.22
	21	ε Bootis	P.	24.9	27.7	29.6	36.5	38.8	41.0	48.0	49.7	52.7	39 38.77	− 0.37	− 5.75	− 5.67	14 39 32.73	+ 0.06
	22	β Bootis	P.	. .	9.7	15.3	17.9	. .	. .	31.4	33.4	36.8	57 20.59	− 0.02	. .	− 5.67	14 57 14.90	+ 0.14
	23	γ^2 Ursæ Minoris . .	P.	16.6	25.0	29.6	. .	. .	. .	. .	28.0	37.0	20 56.62	+ 2.27	. .	− 5.67	15 20 53.22	− 0.02
17	24	Sun I	P.	12.3	14.9	16.4	23.3	25.5	27.5	34.3	35.6	38.3	29 25.34	− 1.24	. .	− 5.75	15 29 18.35	. .
	25	Sun II	P.	29.8	32.7	34.3	40.7	42.8	45.0	51.7	53.3	56.0	31 42.92	− 1.24	. .	− 5.75	15 31 35.93	. .
	26	B. A. C. 5834 . .	P.	. .	. .	. .	47.7	50.3	52.9	57.8	59.9	3.0	10 47.70	− 0.13	. .	− 5.75	17 10 41.82	− 0.25
	27	α Ophiuchi . . .	P.	2.9	5.5	7.0	13.3	15.4	17.5	23.8	25.4	28.0	29 15.42	− 0.67	− 5.73	− 5.69	17 29 9.06	+ 0.07
	28	B. A. C. 5996 . .	P.	13.4	16.0	17.5	23.5	25.7	27.7	33.8	35.4	37.9	37 25.66	− 0.81	. .	− 5.75	17 37 19.10	− 1.25
	29	μ Herculis . . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	30	B. A. C. 6082 . .	P.	. .	. .	. .	. .	. .	. .	. .	16.3	19.3	52 3.99	− 0.12	. .	− 5.74	17 51 58.13	− 0.27
	31	γ Draconis . . .	P.	27.3	31.4	33.7	40.4	43.6	. .	. .	. .	. .	53 46.95	+ 0.38	. .	− 5.69	17 53 41.64	− 0.07
	32	δ Ursæ Minoris . .	P.	. .	. .	. .	. .	. .	. .	. .	36.5	20.0	11 52.56	+16.10	. .	− 5.69	18 12 2.97	− 1.58
	33	ζ Aquilæ	P.	35.0	37.7	39.2	45.5	47.6	49.7	56.0	57.6	0.3	59 47.62	− 0.65	− 5.79	− 5.70	18 59 41.27	+ 0.17
	34	δ Draconis . . .	P.	0.9	7.4	11.6	27.5	32.6	38.3	54.3	58.0	4.8	12 32.82	+ 1.55	. .	− 5.70	19 12 28.67	0.00
	35	τ Draconis . . .	P.	13.3	22.3	27.5	48.2	55.4	2.6	23.6	29.0	37.8	17 55.52	+ 2.44	. .	− 5.70	19 17 52.26	− 0.08
	36	B. A. C. 6690 . .	P.	34.0	36.9	38.6	45.5	47.9	50.2	57.1	58.8	1.8	25 47.87	− 0.36	. .	− 5.74	19 25 41.77	− 0.99
	37	κ Aquilæ	P.	. .	. .	. .	. .	. .	22.8	27.0	28.5	31.0	30 18.70	− 1.03	− 5.80	− 5.70	19 30 11.97	+ 0.14
	38	γ Aquilæ	P.	14.5	17.2	18.8	24.9	27.0	29.1	35.4	36.0	39.5	40 27.03	− 0.71	− 5.72	− 5.70	19 40 20.62	+ 0.05
	39	α Aquilæ	P.	36.9	39.4	40.9	47.0	49.1	51.3	57.5	59.0	1.6	44 49.19	− 0.74	− 5.71	− 5.70	19 44 42.75	+ 0.05
	40	ε Draconis . . .	P.	0.4	7.9	12.4	30.0	36.0	42.0	0.1	4.3	12.0	48 36.12	+ 1.88	. .	− 5.70	19 48 32.30	+ 0.04
	41	Groombridge 4163	P.	8.0	17.4	22.7	44.4	52.0	58.9	21.0	26.4	35.3	48 51.79	+ 2.54	. .	− 5.73	23 48 48.60	− 0.38
	42	ω Piscium . . .	P.	50.8	53.4	54.9	1.2	3.2	5.2	11.4	12.9	15.5	53 3.17	− 0.79	− 5.64	− 5.73	23 52 56.65	− 0.08
	43	B. A. C. 8352 . .	P.	52.0	54.9	56.6	3.6	6.1	8.5	15.6	17.3	20.3	56 6.10	− 1.52	. .	− 5.73	23 55 58.85	− 3.68
	44	4 Ceti	P.	17.6	20.0	21.6	27.8	29.9	32.0	38.0	39.5	42.3	1 29.86	− 0.96	. .	− 5.73	0 1 23.17	− 3.28
	45	5 Ceti	P.	45.7	48.3	49.8	55.9	58.0	0.1	6.2	7.7	10.2	1 57.99	− 0.96	. .	− 5.73	0 1 51.30	− 3.28
	46	B. A. C. 22 . .	P.	53.9	57.0	59.0	7.3	10.1	12.8	20.9	22.9	26.3	5 10.02	− 1.82	. .	− 5.73	0 5 2.47	− 3.99
	47	κ Draconis, S. P. .	P.	55.8	48.2	43.4	25.1	19.0	13.0	54.6	50.0	42.3	28 19.04	− 3.67	. .	− 5.74	12 28 9.63	+ 0.07
	48	B. A. C. 166 . .	P.	34.0	36.9	38.7	45.6	48.1	50.5	57.4	59.2	2.2	32 48.07	− 0.31	. .	− 5.73	0 32 42.03	− 3.27
	49	β Ceti	P.	16.6	19.2	20.8	27.3	29.4	31.6	38.0	39.7	42.3	37 29.43	− 1.25	− 5.72	− 5.74	0 37 22.44	+ 0.03
	50	32^1 Camelopard., S. P.	P.	53.8	38.3	58.8	39.0	18.7	59.4	39.3	0.2	45.3	48 19.20	−10.52	. .	− 5.72	12 48 2.96	+ 3.09

3. Bisections at wires B_2 and B_3.
10. Telescope micrometer reading decreased one revolution in reduction.
11, 44. Wire A used.
12, 18, 23, 34, 40, 41, 47, 50. Bisections at sets B and D.
26. Sun shining on barometer.
32. Bisections at ½ (V + VI) and VI.
45. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	8 16	10 6.3	4.3	12.5	8.2	30	. .	342	. .	370	. .	29.8	8 20 51.6	40.0	+ 8.6	59 27 21.4	−13 8
2	31 36	9 24.2	19.6	29.8	25.8	35	. .	800	. .	980	. .	29.5	31 39 39.4	. .	+ 36.0	82 46 36.6	+ 1.6
3	310 12	23.8	20.2	0.0	26.0	33	775	755	. .	. .	. .	29.5	310 15 43.6	. .	− 1 8.9	1 20 55.9	+ 0.2
4	310 12	23.8	20.2	0.0	26.0	33	600	. .	610	. .	640	29.5	310 15 44.3	. .	− 1 8.9	1 20 56.6	+ 0.9
5	47 38	10 4.0	29.3	7.3	2.3	34	. .	015	. .	025	. .	29.5	47 41 59.6	. .	+ 1 4.2	98 49 25.9	+ 3.2
6	24 8	11.6	5.9	16.2	10.2	38	. .	300	. .	290	. .	29.5	24 10 46.6	44.0	+ 26.2	75 17 34.0	+ 3.8
7	18 38	9 29.6	27.7	8.8	2.0	37	. .	525	. .	465	. .	29.5	18 41 7.8	. .	+ 19.8	69 47 48.8	+ 2.2
8	28 40	10 6.1	2.7	11.8	6.5	32	. .	440	. .	520	. .	29.5	28 44 19.7	. .	+ 32.1	79 51 13.0	. .
9	15 58	9 28.8	27.7	7.5	0.5	39	. .	140	. .	130	. .	29.5	16 0 43.6	. .	+ 16.8	67 7 21.6	+ 1.9
10	30 34	27.6	22.5	3.2	28.2	38	. .	. .	. .	880	. .	29.5	30 37 6.2	. .	+ 34.6	81 44 2.0	+ 0.3
11	13 46	10 1.5	28.5	9.0	2.2	34	. .	810	. .	910	. .	29.5	13 52 20.3	. .	+ 14.5	64 58 56.0	− 1.4
12	321 34	3.0	29.5	7.8	4.5	34	965	. .	. .	. .	975	29.5	321 37 45.4	. .	− 46.4	12 43 20.2	+ 0.4
13	359 50	9 26.0	25.1	7.0	29.9	32	770	745	. .	775	800	30.8	359 54 24.2	33.5	− 0.1	51 0 45.3	+ 0.6
14	27 12	10 1.8	0.0	10.5	4.2	35	905	910	. .	990	965	30.8	27 15 30.7	. .	+ 31.2	78 22 23.1	−16.2
15	307 30	9 27.9	25.6	6.2	2.9	34	140	155	088	125	132	30.8	307 34 1.7	. .	− 1 18.5	358 39 4.4	− 0.5
16	49 18	10 3.9	1.3	11.5	5.8	29	. .	. .	. .	350	375	30.8	49 23 10.1	. .	+ 1 10.5	100 30 41.8	+ 1.5
17	38 46	2.9	0.1	11.0	5.0	32	220	230	. .	315	335	30.8	38 50 26.1	34.6	+ 48.6	89 57 35.9	+ 1.4
18	333 52	9 29.2	26.8	7.8	2.6	33	605	. .	580	. .	590	30.8	333 56 9.2	. .	− 29.5	25 2 0.9	+ 1.2
19	19 0	10 0.1	28.0	8.7	2.1	35	735	750	. .	840	860	30.8	19 3 34.9	. .	+ 20.9	70 10 17.0	+ 2.3
20	50 8	3.4	0.0	11.5	5.1	32	. .	. .	. .	475	515	30.8	50 12 22.8	35.7	+ 1 12.4	101 19 56.4	. .
21	11 14	9 29.0	27.1	8.5	1.7	35	660	705	. .	710	750	30.8	11 17 37.1	36.0	+ 12.0	62 24 10.3	+ 2.1
22	357 56	10 1.0	29.0	9.7	4.2	30	420	400	. .	430	405	30.8	358 0 56.4	36.1	− 2.1	49 7 15.5	+ 2.7
23	326 34	9 28.3	25.2	6.7	1.8	34	780	. .	. .	. .	745	30.8	326 37 52.6	. .	− 39.7	17 43 34.1	0.0
24	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
25	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	36.1	. .	. . . .	. .
26	1 52	29.9	28.1	9.5	3.2	31	. .	. .	. .	590	585	29.4	1 56 38.1	37.0	+ 2.0	53 3 1.3	− 4.3
27	26 10	10 2.2	29.0	9.2	4.2	33	645	635	. .	640	660	29.4	26 14 5.0	. .	+ 29.7	77 20 55.9	+ 1.7
28	34 12	1.6	28.6	8.5	3.8	34	855	850	. .	885	880	29.4	34 15 46.7	. .	+ 41.0	85 22 48.9	− 5.1
29	11 2	9 29.0	27.3	9.0	2.2	34	865	890	. .	990	975	29.4	11 5 47.3	. .	+ 11.8	62 12 20.3	+ 1.7
30	1 34	29.2	27.6	8.8	2.2	35	960	965	. .	. .	. .	29.4	1 37 31.2	. .	+ 1.7	52 43 54.1	+ 0.4
31	347 20	27.7	25.5	6.6	1.3	35	. .	. .	. .	910	905	29.4	347 23 34.7	. .	− 13.5	38 29 42.4	− 0.6
32	312 14	28.3	26.6	7.1	4.0	33	. .	. .	. .	490	680	29.4	312 18 12.6	37.2	− 1 6.1	3 23 27.7	− 0.9
33	25 8	29.2	27.3	9.2	3.3	32	560	565	. .	595	630	29.4	25 12 22.6	36.5	+ 28.4	76 19 12.2	+ 1.8
34	331 24	24.9	23.4	4.2	0.0	36	390	. .	380	. .	395	29.4	331 27 28.6	. .	− 32.8	22 33 17.0	− 0.8
35	325 44	27.3	24.1	6.3	2.7	39	. .	135	110	150	. .	29.4	325 46 45.2	. .	− 41.1	16 52 25.3	+ 0.3
36	11 8	10 2.3	0.2	10.5	4.6	36	345	355	. .	365	380	29.4	11 11 22.8	. .	+ 12.0	62 17 56.0	+ 9.3
37	46 6	1.9	28.9	9.1	3.0	30	. .	. .	. .	860	840	29.4	46 10 48.4	. .	+ 1 2.9	97 18 12.5	+ 2.0
38	28 30	9 28.0	25.4	6.0	0.6	32	725	730	. .	735	750	29.4	28 34 22.6	. .	+ 32.9	79 41 16.7	+ 0.3
39	30 16	10 0.7	28.2	8.5	3.4	31	760	750	. .	780	820	29.4	30 20 34.5	. .	+ 35.4	81 27 31.1	+ 1.3
40	328 54	9 29.6	27.8	6.8	3.0	38	020	. .	005	. .	065	29.4	328 56 59.8	35.4	− 37.7	20 2 43.3	− 2.4
41	325 8	29.7	26.8	7.3	3.5	38	410	. .	385	. .	400	30.6	325 10 55.3	. .	− 42.5	16 16 34.0	+ 0.2
42	32 38	10 2.1	28.8	9.0	3.0	32	650	645	. .	. .	. .	30.6	32 42 21.5	. .	+ 39.2	83 49 21.9	+ 1.8
43	69 12	2.2	28.0	8.0	3.8	34	. .	910	. .	980	. .	30.6	69 15 46.6	32.0	+ 2 40.3	120 24 48.1	+11.7
44	42 0	9 29.1	24.6	6.5	1.2	32	215	220	. .	. .	. .	30.6	42 7 3.8	. .	+ 55 2	93 14 20.2	+20.2
45	42 0	29.1	24.6	6.5	1.2	35	. .	. .	. .	990	005	30.6	42 1 1.0	. .	+ 55.1	93 8 17.3	+20.2
46	79 48	10 1.2	27.0	6.1	2.5	34	. .	035	. .	915	. .	30.6	79 52 3.1	31.7	+ 5 31.4	131 3 55.7	+ 9.3
47	289 20	9 28.7	26.5	5.5	2.0	31	670	. .	665	. .	640	30.6	289 24 39.4	. .	− 2 50.4	340 28 10.2	+ 3.1
48	8 38	10 1.4	28.2	9.1	3.6	32	450	445	. .	455	490	30.6	8 42 25.1	. .	+ 9.4	59 48 55.7	+29.2
49	57 28	9 29.2	26.5	7.1	2.6	33	640	645	. .	680	685	30.6	57 32 8.0	. .	+ 1 36.1	108 40 5.3	+ 0.1
50	302 56	10 3.0	29.5	8.8	5.8	31	725	. .	. .	. .	795	30.6	303 0 33.5	. .	− 1 34.0	354 5 20.7	+31.6

No.	Barom.	At. Ther.
	in.	°
1	29.66	43.3
6	29.73	47.0
13	30.13	34.4
17	30.14	35.7
20	30.16	36.5
21	30.15	37.0
22	30.16	37.0
25	30.165	37.6
26	30.20	57.4
32	30.20	38.5
33	30.21	38.2
40	30.23	37.0
43	30.30	34.1
46	30.31	33.7

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
8	− 0.1	. .	. .	− 0.1
20	− 6.4	− 3.2	. .	− 9.6

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Nov. 17	1	32^2 Camelopard., S. P.	P.	1.5	46.0	6.2	46.6	26.7	6.5	46.8	6.9	52.4	48 26.62	−10.52	. .	− 5.74	12 48 10.36	− 0.30
	2	ε Piscium . . .	P.	25.0	27.6	29.1	35.3	37.3	39.4	45.5	47.1	49.7	56 37.33	− 0.77	− 5.67	− 5.74	0 56 30.82	− 0.05
	3	B. A. C. 332 . .	P.	16.0	18.7	20.2	26.4	28.5	30.6	36.9	38.3	41.0	2 28.49	− 1.10	. .	− 5.72	1 2 21.67	− 3.58
	4	B. A. C. 366 . .	P.	54.6	57.6	59.5	6.9	9.4	12.0	19.5	21.4	24.7	7 9.51	− 1.66	. .	− 5.72	1 7 2.13	− 3.94
	5	Polaris	P.	. .	. .	6.5	32.0	57.5	26.0	55.0	. .	. .	12 59.40	+41.49	. .	− 5.74	1 13 35.15	− 2.12
	6	B. A. C. 424 . .	P.	19.7	22.6	24.4	31.7	34.2	36.5	43.9	45.6	48.6	18 34.13	− 1.57	. .	− 5.72	1 18 26.84	− 3.88
	7	η Piscium . . .	P.	45.2	47.7	49.3	55.6	57.7	59.9	6.2	7.7	10.4	24 57.74	− 0.63	− 5.73	− 5.75	1 24 31.36	+ 0.05
	8	ο Piscium . . .	P.	45.5	48.0	49.5	55.7	57.7	59.9	6.0	7.6	10.2	38 57.79	− 0.75	− 5.71	− 5.75	1 38 51.29	− 0.07
	9	B. A. C. 569 . .	P.	53.4	56.3	58.0	5.1	7.3	9.8	16.8	18.3	21.4	46 7.38	− 0.34	. .	− 5.72	1 46 1.32	− 3.80
	10	β Arietis	P.	41.0	43.9	45.5	52.0	54.3	56.4	2.9	4.6	7.3	47 54.21	− 0.53	− 5.69	− 5.75	1 47 47.93	− 0.04
	11	Neptune . . .	P.	58.0	0.2	1.8	8.0	10.0	12.1	18.4	19.9	22.5	58 10.10	− 0.72	. .	− 5.71	1 58 3.67	. .
	12	Durch. 10°, 285 .	P.	. .	. .	. .	. .	. .	25.3	29.5	31.0	33.6	58 21.16	− 0.72	. .	− 5.71	1 58 14.73	− 3.72
	13	α Draconis, S.P. .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	14	5 Ursæ Minoris, S.P.	P.	47.0	36.6	30.2	4.3	55.6	47.2	21.4	14.7	4.3	27 55.70	+ 4.92	. .	− 5.75	14 27 45.03	− 0.29
	15	γ Ceti	P.	47.6	50.0	51.7	57.7	59.9	1.9	8.0	9.6	12.2	36 59.84	− 0.85	− 5.70	− 5.75	2 36 53.24	− 0.05
	16	α Ceti	P.	42.9	45.5	47.0	53.1	55.1	57.2	3.3	4.9	7.4	55 55.16	− 0.84	− 5.68	− 5.76	2 55 48.56	− 0.06
	17	Clotho	P.	7.4	9.8	11.5	17.7	19.5	21.6	27.7	29.4	32.0	18 19.62	− 0.98	. .	− 5.70	3 18 12.94	. .
	18	Egeria	P.	49.4	52.0	54.0	0.7	2.7	5.0	11.9	13.6	16.2	20 2.83	− 0.44	. .	− 5.70	3 19 56.69	. .
	19	Pomona . . .	P.	4.9	7.6	9.0	15.5	17.7	19.7	26.0	27.7	30.5	36 17.62	− 0.58	. .	− 5.70	3 36 11.34	. .
	20	Lutetia	P.	43.7	46.3	48.0	54.6	56.7	58.8	5.4	7.1	9.9	54 56.72	− 0.50	. .	− 5.69	4 54 50.53	. .
	21	α Canis Minoris. .	P.	45.6	47.2	51.3	53.2	55.3	57.4	59.4	3.5	5.0	32 55.32	− 0.80	− 5.75	− 5.79	7 32 48.73	− 0.20
	22	β Geminorum . .	P.	36.0	38.9	40.7	47.5	49.7	52.0	59.0	0.8	3.6	37 49.80	− 0.35	− 5.58	− 5.79	7 37 43.76	− 0.14
	23	λ Ursæ Minoris, S. P.	P.	. .	. .	17.0	27.0	36.0	43.0	. .	. .	. .	48 35.48	−54.48	. .	− 5.79	19 47 35.21	− 1.20
	24	Moon II, S. . .	P.	27.0	29.9	31.7	38.5	40.7	43.0	49.8	51.5	54.4	36 40.72	− 0.47	. .	− 5.66	8 36 34.59	−73.05
18	25	Polaris, S. P. . .	E.	6.0	18.0	12.5	. .	28.0	57.0	37.0	35.0	46.0	14 25.85	−43.60	. .	− 6.24	1 13 36.01	− 0.47
	26	α Bootis	E.	52.6	55.2	56.8	3.3	5.5	7.7	14.2	15.8	18.6	10 5.52	− 0.46	− 6.27	− 6.24	14 9 58.82	+ 0.03
	27	Mercury II. S. .	E.	26.2	28.6	30.3	36.7	38.8	40.9	47.3	48.7	51.5	26 38.78	− 1.01	. .	− 6.24	14 26 31.53	− 0.21
	28	Mercury N. . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	29	ε Bootis	E.	25.3	28.2	30.0	36.9	39.2	41.6	48.4	50.1	53.0	39 39.19	− 0.30	− 6.22	− 6.25	14 39 32.64	− 0.05
19	30	Sun I, N. . . .	E.	31.5	34.0	35.9	42.3	44.6	47.0	53.4	55.0	57.6	37 44.59	− 1.14	. .	− 6.25	15 37 37.20	. .
	31	Sun II, S. . . .	E.	49.5	52.0	53.8	0.3	2.6	4.7	11.3	12.8	15.5	40 2.50	− 1.14	. .	− 6.25	15 39 55.11	. .
21	32	δ Crateris . . .	P.	2.4	5.0	6.6	12.9	15.0	17.1	23.5	25.0	27.6	13 15.01	− 1.21	− 6.29	− 6.24	11 13 7.56	+ 0.03
	33	τ Leonis	P.	27.5	30.1	31.7	37.8	39.8	41.8	48.0	49.5	52.1	21 39.81	− 0.87	− 6.22	− 6.24	11 21 32.70	− 0.04
	34	λ Draconis . . .	P.	29.5	37.1	41.5	59.4	5.4	11.4	29.2	33.5	41.3	24 5.37	+ 1.89	. .	− 6.24	11 24 1.02	+ 0.09
	35	υ Leonis	P.	29.9	32.5	34.0	40.2	42.3	44.3	50.4	51.9	54.4	30 42.21	− 0.94	− 6.24	− 6.24	11 30 35.03	− 0.04
	36	β Leonis	P.	37.4	39.9	41.5	47.9	50.0	52.1	58.5	0.1	2.6	42 50.00	− 0.65	− 6.23	− 6.24	11 42 43.11	− 0.03
	37	B. A. C. 4002 . .	P.	8.0	10.6	12.1	18.3	20.3	22.3	28.5	30.0	32.6	44 20.30	− 0.90	. .	− 6.25	11 44 13.15	− 2.05
	38	γ Ursæ Majoris . .	P.	. .	. .	. .	23.1	26.7	30.2	37.1	39.6	44.0	47 23.04	+ 0.50	. .	− 6.24	11 47 17.30	− 0.07
	39	Moon II, S. . .	P.	. .	. .	2.4	4.6	6.7	8.8	11.0	. .	. .	1 6.70	− 0.94	. .	− 6.24	12 0 59.52	−62.76
	40	4 Draconis . . .	P.	. .	. .	. .	. .	. .	43.0	3.5	10.7	23.6	6 22.72	+ 4.01	. .	− 6.24	12 6 20.49	− 0.89
	41	η Virginis . . .	P.	27.6	30.1	31.5	37.6	39.7	41.8	47.9	49.5	51.9	13 39.73	− 0.95	− 6.24	− 6.24	12 13 32.54	− 0.02
	42	B. A. C. 4211 . .	P.	20.3	22.9	24.5	30.9	33.0	35.1	41.5	43.0	45.8	23 33.00	− 1.25	. .	− 6.23	12 23 25.52	− 1.66
	43	β Corvi	P.	45.3	48.1	49.8	56.4	58.6	0.9	7.5	9.1	12.0	27 58.63	− 1.38	− 6.30	− 6.24	12 27 51.01	+ 0.02
	44	12 Canum Venat. .	P.	2.9	6.1	8.1	16.0	18.7	21.3	29.1	31.2	34.4	50 18.64	− 0.10	− 6.15	− 6.23	12 50 12.31	− 0.08
	45	Polaris, S. P. . .	P.	. .	. .	. .	22.5	56.5	28.0	37.5	32.5	45.0	14 24.06	−43.19	. .	− 6.24	1 13 34.63	− 0.16
	46	Polaris, S. P. . .	Sk.	5.0	15.5	11.0	18.0	50.5	. .	. .	. .	. .	14 23.52	−43.19	. .	− 6.10	1 13 34.23	− 0.56
	47	α Virginis . . .	Sk.	32.9	35.6	37.2	43.4	45.4	47.6	53.8	55.3	57.9	18 45.46	− 1.14	− 6.21	− 6.10	13 18 28.22	+ 0.09

1, 14, 24, 34, 39, 40. Bisections at sets B and D.
11, 17, 18, 19, 20. Wire A used.
12. Wire B used.
13. Bisections at II and ½ (II + III.)
38. Bisections at wires V and VI.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	302 56	10 3.0	29.5	8.8	5.8	32	940	. .	. .	. .	015	30.6	303 0 14.9	. .	− 1 34.0	354 5 2.1	+ 2.7
2	31 36	0.7	27.2	7.4	3.1	35	600	590	. .	615	625	30.6	31 39 37.7	. .	+ 37.8	82 46 36.7	+ 1.6
3	49 38	0.1	27.0	6.8	2.2	30	875	865	. .	. .	. .	30.6	49 42 50.3	. .	+ 1 12.2	100 50 23.7	+ 20.3
4	74 38	2.9	27.0	7.0	3.3	34	542	540	. .	. .	. .	30.6	74 41 52.8	. .	+ 3 40.9	125 51 54.9	+ 14.4
5	310 12	1.2	27.7	6.8	3.7	35	010	940	940	925	950	30.6	310 15 47.6	. .	− 1 11.1	1 20 57.7	+ 2.8
6	71 14	9 28.5	24.0	4.2	0.1	33	770	810	. .	850	850	30.6	71 18 7.5	. .	+ 2 59.5	122 27 28.2	+ 15.8
7	24 8	29.8	27.1	8.1	2.7	39	150	155	. .	195	215	30.6	24 10 43.2	30.3	+ 27.5	75 17 31.9	+ 1.8
8	30 18	28.9	25.5	6.4	1.6	38	. .	330	. .	335	. .	30.6	30 20 57.4	. .	+ 35.9	81 27 54.5	− 0.2
9	9 50	10 0.0	27.5	7.6	2.1	30	710	750	. .	. .	. .	30.6	9 54 52.5	. .	+ 10.7	61 1 24.4	+ 27.8
10	18 38	9 29.6	27.2	8.3	2.3	37	. .	695	. .	700	. .	30.6	18 41 6.0	. .	+ 20.7	69 47 47.9	+ 1.4
11	28 38	10 0.0	26.9	7.0	2.0	31	. .	. .	. .	. .	415	30.6	28 45 15.8	. .	+ 33.7	79 52 10.7	. .
12	28 38	0.0	26.9	7.0	2.0	30	. .	. .	. .	. .	440	30.6	28 40 25.2	. .	+ 33.6	79 47 20.0	+ 24.9
13	283 52	2.6	29.0	9.5	5.8	35	050	980	. .	. .	. .	30.6	283 55 43.8	29.8	− 4 3.3	334 58 1.7	+ 3.2
14	295 6	1.9	28.5	8.6	5.0	32	020	. .	010	. .	060	30.6	295 10 30.8	. .	− 2 10.1	346 14 41.9	+ 1.7
15	36 6	2.9	29.5	9.1	4.1	33	820	785	. .	. .	. .	30.6	36 10 3.5	. .	+ 44.9	87 17 9.6	+ 1.4
16	35 12	9 29.3	25.9	7.0	1.4	31	650	610	. .	680	690	30.6	35 16 39.3	28.8	+ 43.5	86 23 44.0	− 0.2
17	42 44	28.2	24.7	5.9	0.6	34	215	265	. .	. .	. .	30.6	42 50 33.4	. .	+ 57.0	93 57 51.6	− 5.7
18	14 42	28.6	25.0	6.8	1.0	33	. .	. .	. .	175	170	30.6	14 48 50.1	28.7	+ 16.3	65 55 27.6	− 1.5
19	21 42	10 1.0	28.4	9.9	2.7	33	. .	660	. .	770	. .	30.6	21 48 38.7	. .	+ 24.6	72 55 24.5	− 1.9
20	17 22	9 27.6	26.4	7.0	1.0	39	. .	435	. .	410	. .	30.6	17 27 13.8	27.1	+ 19.4	68 33 54.4	− 1.8
21	33 16	29.8	26.5	7.9	2.7	33	. .	145	. .	140	. .	30.6	33 20 15.8	. .	+ 40.7	84 27 17.7	− 1.6
22	10 30	27.9	26.5	7.1	1.9	34	. .	550	. .	590	. .	30.6	10 33 54.9	25.3	+ 11.5	61 40 27.6	0.0
23	307 46	10 0.1	26.2	6.8	4.3	29	730	790	855	. .	. .	30.6	307 51 6.7	. .	− 1 19.6	358 56 8.3	+ 0.5
24	6 0	1.2	29.4	9.5	3.2	33	790	. .	555	. .	320	30.6	16 4 7.8	24.8	+ 17.9	67 10 46.9	. .
25	307 30	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
26	19 0	3.8	2.0	14.0	6.3	35	. .	270	. .	265	. .	27.8	19 3 35.7	. .	+ 19.8	70 10 16.7	+ 1.4
27	51 2	0.7	27.5	9.0	1.6	29	115	. .	. .	. .	015	27.8	51 7 14.7	56.0	+ 1 11.0	102 14 46.9	. .
28	51 2	0.7	27.5	9.0	1.6	29	. .	535	. .	285	. .	27.8	51 7 9.5	. .	+ 1 11.0	102 14 41.7	. .
29	11 14	9 26.7	25.3	6.7	0.6	35	. .	550	. .	520	. .	27.8	11 17 38.4	. .	+ 11.4	62 24 11.0	+ 2.2
30	58 2	10 0.9	25.2	7.0	2.1	33	590	570	. .	. .	. .	27.8	58 6 6.4	58.0	+ 1 31.3	109 13 58.9	. .
31	58 34	1.5	25.8	7.9	3.2	32	. .	. .	. .	225	125	27.8	58 38 27.2	. .	+ 1 33.2	109 46 21.6	. .
32	52 56	2.0	26.6	7.4	2.3	39	. .	995	. .	985	. .	29.8	52 58 29.6	29.6	+ 1 21.9	104 6 12.7	− 0.8
33	35 16	0.5	25.5	7.0	1.4	32	410	425	. .	. .	. .	29.8	35 20 26.3	. .	+ 43.9	86 27 31.4	− 0.3
34	328 48	0.8	27.7	7.1	4.2	27	990	. .	940	. .	975	29.8	328 53 33.6	. .	− 37.4	19 59 17.4	− 1.2
35	38 56	9 29.4	25.3	5.9	1.7	30	160	185	. .	210	235	29.8	39 1 1.1	29.7	+ 50.1	90 8 12.4	+ 0.2
36	23 32	26.9	25.0	6.9	0.3	29	470	455	. .	. .	. .	29.8	23 37 13.0	. .	+ 27.1	74 44 1.3	+ 0.1
37	36 20	29.6	25.8	6.0	3.2	30	. .	480	. .	470	. .	29.8	36 24 56.3	. .	+ 45.6	87 32 3.1	− 12.8
38	344 26	10 0.3	28.0	7.9	4.1	30	. .	. .	. .	100	095	29.8	344 31 3.6	. .	− 17.1	35 37 7.7	+ 2.0
39	38 54	9 25.4	21.3	3.4	28.5	32	520	. .	370	. .	145	29.8	38 58 31.7	30.6	+ 50.0	90 5 42.9	. .
40	320 32	28.4	26.5	6.9	3.1	32	. .	. .	. .	660	640	29.8	320 36 23.3	. .	− 50.7	11 41 53.8	− 1.8
41	38 48	10 0.0	25.9	7.0	1.9	36	. .	. .	. .	745	755	29.8	38 51 20.5	. .	+ 49.8	89 58 31.5	− 0.1
42	54 38	9 29.0	25.1	6.0	0.7	36	085	070	. .	. .	. .	29.8	54 41 31.0	. .	+ 1 27.1	105 49 19.3	− 9.1
43	61 32	29.0	25.0	7.0	2.5	41	. .	265	. .	260	. .	29.8	61 34 11.3	31.2	+ 1 53.7	112 42 26.2	+ 1.4
44	359 50	27.5	26.0	6.0	0.5	32	610	610	. .	635	655	29.8	359 54 24.9	32.1	− 0.1	51 0 46.0	− 0.3
45	307 30	28.7	26.1	6.0	3.6	33	. .	. .	855	835	865	29.8	307 34 4.6	. .	− 1 20.0	358 39 5.8	− 0.8
46	307 30	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
47	49 18	10 1.8	28.5	8.3	3.4	29	530	550	. .	. .	. .	28.8	49 23 7.3	32.4	+ 1 11.8	100 30 40.3	− 0.6

No.	Barom.	At. Ther.
	in.	°
7	30.31	32.5
13	30.30	32.2
16	30.30	31.4
18	30.30	31.2
20	30.30	29.5
22	30.30	27.8
24	30.32	28.3
27	29.86	53.0
30	29.80	55.0
32	30.54	32.4
35	30.56	32.4
39	30.57	32.7
43	30.58	33.0
44	30.58	33.6
47	30.59	34.6

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
11	− 0.1	. . .	. .	− 0.1
24	− 16 6.9	− 16 15.4	. .	− 32 22.3
28	− 6.3	− 2.7	. .	− 9.0
29	− 6.3	+ 2.7	− 0.2	− 3.8
31	− 7.6	+ 16 11.3	. .	+ 16 3.7
32	− 7.7	− 16 11.3	. .	− 16 19.0
40	− 34 52.2	− 15 12.7	. .	− 50 4.9

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Nov. 21	1	ζ Virginis	Sk.	18.5	20.0	24.0	26.1	28.2	30.3	32.3	36.2	37.7	28 28.14	− 0.95	− 6.16	− 6.10	13 28 21.09	+ 0.06
	2	α Bootis	Sk.	52.5	55.2	56.9	3.3	5.6	7.6	14.1	15.8	18.5	10 5.50	− 0.58	− 6.08	− 6.09	14 9 58.83	− 0.01
	3	ε Bootis	Sk.	25.3	28.0	30.0	36.9	39.3	41.5	48.4	50.1	52.8	39 39.14	− 0.42	− 5.99	− 6.09	14 39 32.63	− 0.12
	4	Mercury II, S.	Sk.	54.6	57.4	59.0	5.3	7.4	9.4	15.8	17.4	20.0	42 7.37	− 1.20	. .	− 6.14	14 42 0.03	− 0.20
22	5	Sun I, N.	Sk.	5.7	8.8	10.3	16.9	19.0	21.0	27.6	29.2	32.0	50 18.94	− 1.33	. .	− 6.12	15 50 11.49	. .
	6	Sun II, S.	Sk.	24.8	27.2	29.0	35.2	37.5	39.6	46.4	48.1	50.9	52 37.63	− 1.33	. .	− 6.12	15 52 30.18	. .
	7	Venus I	Sk.	14.7	17.4	19.2	25.9	28.0	30.1	37.0	38.6	41.4	56 28.03	− 1.39	. .	− 6.09	16 56 20.55	+ 0.38
	8	μ Herculis	Sk.	27.2	30.2	31.8	38.8	41.0	43.4	50.4	51.9	54.9	41 41.07	− 0.41	− 6.05	− 6.08	17 41 34.58	− 0.03
	9	η Serpentis	Sk.	49.4	51.0	54.9	57.0	59.0	1.0	3.1	7.3	8.7	14 59.04	− 1.01	− 6.08	− 6.08	18 14 51.95	+ 0.06
	10	ω Piscium (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	11	ω Piscium	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	12	B. A. C. 8375	Sk.	27.1	30.6	32.6	40.4	43.1	45.6	53.6	55.6	59.0	0 43.07	− 1.82	. .	− 6.05	0 0 35.20	− 3.86
	13	B. A. C. 5	Sk.	. .	. .	. .	. .	. .	. .	37.3	38.7	41.4	2 29.07	− 1.04	. .	− 6.05	0 2 21.98	− 3.24
	14	β Ceti	Sk.	16.9	19.7	21.0	27.6	29.8	32.0	38.4	40.0	42.6	37 29.78	− 1.33	− 6.02	− 6.05	0 37 22.40	+ 0.02
	15	B. A. C. 334	Sk.	39.0	42.1	43.9	51.6	54.0	56.4	4.0	5.8	9.0	2 53.98	− 0.29	. .	− 6.05	1 2 47.64	− 3.51
	16	Polaris	Sk.	. .	. .	5.5	26.0	58.5	36.0	50.0	. .	. .	12 59.20	+40.69	. .	− 6.05	1 13 33.84	− 0.68
24	17	π Aquarii (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	18	π Aquarii	F.	. .	. .	. .	. .	. .	. .	11.9	13.3	16.0	19 3.69	− 0.91	− 6.60	− 6.53	22 18 56.25	+ 0.09
	19	η Aquarii (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	20	η Aquarii	F.	. .	. .	. .	. .	. .	. .	14.4	16.0	18.5	29 6.25	− 0.94	− 6.66	− 6.53	22 28 58.78	+ 0.16
	21	ι Cephei (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	22	ι Cephei	F.	. .	. .	. .	. .	. .	. .	. .	43.7	49.9	45 20.20	+ 1.23	. .	− 6.53	22 45 14.90	− 0.06
	23	α Piscis Australis	F.	41.6	44.4	46.4	53.5	55.9	58.2	5.3	7.0	10.0	50 55.81	− 1.51	− 6.52	− 6.53	22 50 47.77	+ 0.03
	24	α Pegasi	F.	29.3	32.0	33.5	39.8	41.9	44.0	50.3	51.9	54.6	58 41.92	− 0.66	− 6.50	− 6.53	22 58 34.73	0.00
	25	o Cephei (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	26	o Cephei	F.	11.2	15.4	25.9	31.0	36.5	41.8	47.2	57.8	1.7	13 36.50	+ 1.48	. .	− 6.53	23 13 31.45	− 0.13
	27	θ Piscium	F.	35.6	38.1	39.6	45.8	47.9	50.0	56.1	57.7	0.2	21 47.89	− 0.83	− 6.49	− 6.53	23 21 40.53	+ 0.02
	28	Groom. 4163 (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	29	Groom. 4163	F.	. .	. .	. .	. .	59.8	7.4	21.7	27.2	36.4	49 52.55	+ 2.50	. .	− 6.54	23 48 48.51	− 0.09
	30	B. A. C. 8375	F.	. .	. .	40.9	43.6	46.3	48.9	54.3	56.1	59.2	0 43.56	− 1.75	. .	− 6.50	0 0 35.31	− 3.84
	31	B. A. C. 24	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	32	β Ceti	F.	17.3	20.0	21.7	28.0	30.2	32.3	38.9	40.3	43.3	37 30.22	− 1.26	− 6.55	− 6.54	0 37 22.42	+ 0.06
	33	Polaris	F.	. .	. .	4.0	31.5	58.0	25.0	52 0	. .	. .	12 58.10	+41.67	. .	− 6.54	1 13 33.23	− 0.29
	34	B. A. C. 411	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	35	η Piscium	F.	. .	. .	. .	. .	. .	. .	7.0	8.6	11.3	24 58.57	− 0.66	− 6.55	− 6.54	1 24 51.37	+ 0.08
	36	o Piscium	F.	46.2	48.8	50.3	56.4	58.6	0.7	6.9	8.3	10.9	38 58.57	− 0.77	− 6.47	− 6.54	1 38 51.26	− 0.10
	37	B. A. C. 569	F.	54.3	57.1	58.8	. .	. .	. .	. .	. .	. .	46 8.24	− 0.37	. .	− 6.47	1 46 1.40	− 3.80
	38	B. A. C. 570	F.	. .	. .	. .	. .	. .	. .	29.4	31.5	35.0	46 18.79	− 1.77	. .	− 6.47	1 46 10.55	− 4.00
	39	Neptune	F.	20.0	22.5	24.0	30.2	32.2	34.3	40.6	42.1	44.7	57 32.29	− 0.75	. .	− 6.47	1 57 25.07	. .
	40	Durch. 10°, 285	F.	12.1	13.7	17.9	20.0	22.0	24.2	26.2	30.4	31.9	58 22.04	− 0.75	. .	− 6.47	1 58 14.82	− 3.72
	41	α Arietis	F.	. .	14.3	16.4	18.6	20.8	23.0	27.6	29.1	31.9	0 18.62	− 0.50	− 6.48	− 6.54	2 0 11.58	− 0.05
	42	5 Ursæ Minoris, S. P.	F.	48.5	37.8	31.3	5.6	57.0	48.6	22.7	16.3	5.1	27 56.99	− 5.35	. .	− 6.54	14 27 45.10	− 0.41
	43	B. A. C. 853	F.	25.3	28.5	30.6	38.7	41.4	44.1	52.2	54.2	57.5	38 41.39	− 1.79	. .	− 6.46	2 38 33.14	− 3.98
	44	Ate	F.	13.5	16.5	18.1	. .	. .	. .	35.7	37.7	40.1	45 26.93	− 0.47	. .	− 6.46	2 45 20.00	. .
	45	Clotho	F.	6.1	8.7	10.3	16.2	18.3	20.3	26.6	28.0	30.8	13 18.37	− 1.00	. .	− 6.46	3 13 10.91	. .
27	46	B. A. C. 7702	F.	. .	. .	15.8	18.3	20.7	23.1	28.2	30.0	33.2	1 18.25	− 1.64	. .	− 6.57	22 1 10.04	− 3.18
	47	Lacaille 9036	F.	34.0	37.0	38.9	46.3	48.8	51.3	58.8	0.7	3.7	2 48.83	− 1.64	. .	− 6.57	22 2 40.62	− 3.18
	48	η Aquarii (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .
	49	η Aquarii	F.	. .	. .	. .	. .	. .	. .	14.4	15.9	18.4	29 6.19	− 0.98	− 6.59	− 6.53	22 28 58.68	+ 0.09

2. Telescope micrometer reading increased one revolution in reduction.
11. Micrometer readings reduced for 32.520 and 32.552.
21, 26, 28, 29, 30, 42. Bisections at sets B and D.
26, 29, 30, 41. Wire B used.
44, 45, 46. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	38 46	10 1.2	27.6	8.7	3.8	32	. .	. .	. .	430	432	28.8	38 50 24.2	. .	+ 49.6	89 57 35.0	− 0.4
2	19 0	3.3	1.0	13.2	5.4	34	. .	. .	. .	472	462	28.8	19 3 34.8	. .	+ 21.2	70 10 17.2	+ 1.1
3	11 14	9 29.0	29.9	10.5	7.7	35	. .	470	. .	518	. .	28.8	11 17 35.5	. .	+ 12.3	62 24 9.0	− 0.7
4	52 32	10 1.0	28.9	10.5	4.3	30	. .	. .	. .	990	930	28.8	52 36 44.9	. .	+ 1 20.2	103 44 26.3	. .
5	58 42	9 27.9	26.0	7.5	0.7	33	740	768	. .	. .	. .	28.8	58 46 5.5	. .	+ 1 40.9	109 54 7.6	. .
6	59 14	29.3	23.8	6.3	2.2	32	. .	. .	. .	060	110	28.8	59 18 31.2	35.8	+ 1 42.8	110 26 35.2	. .
7	62 0	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
8	11 2	10 1.4	1.5	14.5	5.9	34	. .	. .	. .	510	498	28.8	11 5 49.5	. .	+ 12.2	62 12 22.9	+ 3.0
9	41 44	3.0	1.5	12.5	5.7	31	. .	. .	. .	508	510	28.8	41 48 35.2	38.3	+ 54.4	92 55 50.8	+ 1.5
10	147 14	6.0	1.9	11.2	7.0	35	094	130	. .	. .	. .	29.2	147 17 39.0	. .	− 39.7	83 49 21.9	+ 1.6
11	32 38	4.0	0.7	10.3	4.0	32	. .	. .	. .	320	352	29.2	32 42 20.9	. .	+ 39.7	83 49 21.8	+ 1.5
12	78 20	2.1	27.5	6.5	2.8	37	. .	. .	. .	750	856	29.2	78 23 2.4	. .	+ 4 53.6	129 34 17.2	+ 8.6
13	41 44	1.7	27.2	7.5	3.0	36	. .	. .	. .	048	100	29.2	41 47 29.1	. .	+ 55.2	92 54 45.5	+20.0
14	57 28	0.1	25.7	7.4	1.5	33	. .	598	. .	640	. .	29.2	57 32 7.4	30.0	+ 1 37.2	108 40 5.8	+ 0.1
15	3 52	1.0	29.5	9.5	3.0	35	400	412	. .	. .	. .	29.2	3 55 38.1	. .	+ 4.3	55 2 3.6	+30.2
16	310 12	4.0	1.0	10.0	6.1	34	. .	740	742	734	. .	29.2	310 15 46.4	. .	− 1 13.3	1 20 54.3	+ 1.0
17	141 48	9 27.7	25.3	5.2	2.1	34	040	042	. .	. .	. .	29.8	141 52 2.4	. .	− 47.3	89 15 6.1	− 0.1
18	38 4	29.7	24.9	5.4	0.5	34	. .	. .	. .	382	382	29.8	38 7 57.8	. .	+ 47.3	89 15 6.3	+ 0.1
19	140 18	27.6	24.1	5.3	2.5	35	100	104	. .	. .	. .	29.8	140 21 46.4	. .	− 49.9	90 45 24.7	+ 0.9
20	39 34	10 2.9	27.3	8.5	2.6	33	. .	. .	. .	204	210	29.8	39 38 13.1	40.2	+ 49.9	90 45 24.2	+ 0.4
21	206 34	9 27.9	24.5	4.0	28.8	30	366	366	. .	. .	. .	29.8	206 39 0.0	. .	+ 30.3	24 26 50.9	− 0.9
22	333 18	10 5.7	1.2	11.1	7.8	37	. .	. .	. .	648	678	29.8	333 21 2.4	. .	− 30.3	24 26 53.3	+ 1.5
23	69 4	9 28.1	23.2	3.0	0.8	34	. .	. .	. .	370	380	29.8	69 7 59.0	. .	+ 2 37.1	120 16 57.3	+ 1.8
24	24 18	10 1.4	27.3	7.9	1.8	38	. .	652	. .	666	. .	29.8	24 20 50.1	. .	+ 27.3	75 27 38.6	+ 1.5
25	208 28	0.6	27.2	6.9	0.8	33	682	696	. .	. .	. .	29.8	208 32 5.2	. .	+ 32.8	22 33 43.2	− 3.9
26	331 28	9 26.7	23.3	3.6	29.7	40	. .	. .	. .	124	094	29.8	331 27 59.0	. .	− 32.8	22 33 47.4	+ 0.3
27	33 8	28.2	23.0	3.5	0.2	37	864	858	. .	896	900	29.8	33 11 5.4	. .	+ 39.5	84 18 6.1	+ 1.6
28	214 44	10 1.9	29.0	7.9	1.8	29	440	448	. .	. .	. .	29.8	214 49 10.2	. .	+ 42.0	16 16 29.0	− 3.4
29	325 8	9 29.8	25.7	5.8	2.6	28	. .	. .	. .	466	472	29.8	325 10 54.7	39.0	− 42.0	16 16 33.9	+ 1.5
30	78 20	27.5	22.5	1.6	29.2	27	. .	. .	. .	590	590	29.8	78 23 11.1	. .	+ 4 47.1	129 34 19.4	+ 8.4
31	74 36	22.6	17.5	26.5	24.0	35	. .	. .	. .	396	396	29.8	74 39 49.4	. .	+ 3 37.5	125 49 48.1	+ 9.7
32	57 28	27.2	24.0	4.9	0.2	33	. .	564	. .	588	. .	29.8	57 32 10.8	. .	+ 1 35.1	108 40 7.1	+ 1.0
33	310 12	27.4	23.8	3.3	0.4	35	448	442	436	420	414	29.8	310 15 43.0	. .	− 1 11.6	11 20 52.6	− 0.2
34	76 28	26.1	21.8	0.2	26.7	35	. .	. .	. .	830	. .	29.8	76 31 39.3	. .	+ 4 9.0	127 42 9.5	+13.2
35	24 8	10 0.5	27.5	6.8	2.5	39	. .	. .	. .	168	186	29.8	24 10 42.8	. .	+ 27.3	75 17 31.3	+ 1.2
36	30 18	1.0	28.0	7.7	3.0	38	. .	062	. .	080	. .	29.8	30 20 58.8	36.5	+ 35.6	81 27 55.6	+ 0.7
37	9 50	9 29.9	25.5	7.9	1.5	30	750	746	. .	. .	. .	29.8	9 54 52.0	. .	+ 9.6	61 1 22.8	+28.4
38	79 12	10 0.5	25.5	4.5	1.7	36	. .	. .	. .	296	350	29.8	79 15 27.2	. .	+ 5 11.6	130 27 0.0	+14.0
39	28 44	2.6	27.3	9.4	4.8	31	694	710	. .	. .	. .	29.8	28 48 34.9	. .	+ 33.5	79 55 29.6	. .
40	28 36	9 25.4	21.5	2.3	28.2	32	. .	. .	. .	920	914	29.8	28 40 23.6	. .	+ 33.3	79 47 18.1	+24.8
41	16 0	10 2.8	0.0	10.5	4.6	36	. .	. .	. .	940	944	29.8	16 0 41.8	. .	+ 17.5	67 7 20.5	+ 1.3
42	295 6	9 27.1	23.9	4.2	0.3	32	. .	484	. .	470	. .	29.8	295 10 27.7	35.4	− 2 9.2	346 14 39.7	+ 2.2
43	79 48	26.8	21.9	1.5	28.3	36	586	604	. .	. .	. .	29.8	79 51 25.8	. .	+ 5 30.3	131 3 17.3	+16.0
44	14 34	29.9	25.7	6.8	1.2	35	976	912	. .	. .	. .	29.8	14 40 5.7	. .	+ 16.0	65 46 42.9	− 1.5
45	43 9	8 7.3 12 8.1	2.1 2.3	12.4 12.8	7.5 7.3	45	. .	358	. .	366	. .	29.8	43 12 34.9	. .	+ 57.4	94 19 53.5	− 5.7
46	73 24	9 27.0	25.0	1.3	28.3	38	. .	. .	. .	974	970	29.3	73 29 21.8	. .	+ 3 19.7	124 39 2.7	+ 2.0
47	73 24	27.0	25.0	1.3	28.3	34	. .	632	. .	642	. .	29.3	73 27 55.1	. .	+ 3 19.5	124 37 35.8	+ 2.1
48	140 18	27.3	22.2	3.1	1.2	35	120	124	. .	. .	. .	29.3	140 21 47.1	40.0	− 49.8	90 45 23.9	− 0.1
49	39 34	25.4	21.0	2.3	27.1	33	. .	. .	. .	632	638	29.3	39 38 12.5	. .	+ 49.8	90 45 23.5	− 0.5

No.	Barom.	At. Ther.
	in.	°
6	30.60	37.8
9	30.60	40.3
14	30.61	33.6
20	30.42	42.5
29	30.43	41.0
36	30.45	39.0
42	30.48	38.0
48	30.34	42.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	° ′ ″
4	− 6.0	− 2.9	. .	− 8.9
5	− 7.7	+ 16 13.8	. .	+ 16 6.1
6	− 7.7	− 16 13.8	. .	− 16 21.5
39	− 0.1	. .	. .	− 0.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.			.										m. s.	s.	s.	s.	h. m. s.	s.
Nov. 27	1	ζ Pegasi	F.	11.0	13.6	15.2	21.4	23.6	25.5	31.9	33.4	35.9	35 23.50	— 0.79	— 6.54	— 6.53	22 35 16.18	+ 0.07
	2	λ Aquarii (R.) . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	3	λ Aquarii . . .	F.	. .	. .	. .	. .	. .	20.3	24.4	26.0	28.6	46 16.18	— 1.09	— 6.67	— 6.53	22 46 8.56	+ 0.22
	4	α Piscis Australis .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	5	α Pegasi	F.	29.2	32.0	33.5	39.8	42.0	44.0	50.4	51.9	54.6	58 41.93	— 0.71	— 6.49	— 6.53	22 58 34.69	— 0.01
	6	ω Piscium . . .	F.	51.7	54.3	55.9	2.0	4.1	6.0	12.2	13.7	16.2	53 4.01	— 0.86	— 6.49	— 6.53	23 52 56.62	— 0.03
	7	B. A. C. 8375 . .	F.	27.8	31.0	33.0	38.3	41.0	43.8	46.3	48.9	. .	0 43.64	— 1.78	. .	— 6.56	0 0 35.30	— 3.79
	8	B. A. C. 5 . . .	F.	. .	25.6	27.6	29.6	31.7	33.7	37.8	39.3	41.9	2 29.63	— 1.02	. .	— 6.56	0 2 22.05	— 3.19
	9	B. A. C. 24 . .	F.	. .	. .	. .	. .	. .	39.4	44.6	46.4	49.6	5 34.47	— 1.68	. .	— 6.56	0 5 26.23	— 3.71
	10	κ Draconis, S. P. .	F.	56.8	49.0	44.6	26.3	20.2	13.9	55.7	51.5	43.3	28 20.14	— 3.77	. .	— 6.53	12 28 9.84	— 0.30
	11	21 Cassiopeæ . . .	F.	38.4	47.5	53.4	25.7	33.5	41.5	3.9	9.7	19.0	37 33.62	+ 2.56	. .	— 6.53	0 37 29.65	+ 0.24
	12	ε Piscium . . .	F.	26.0	28.4	30.0	36.1	38.2	40.2	46.4	48.0	50.5	56 38.20	— 0.84	— 6.52	— 6.53	0 56 30.83	+ 0.01
	13	Polaris	F.	. .	. .	4.5	29.0	58.5	25.0	49.5	. .	. .	12 57.30	+41.22	. .	— 6.53	1 13 31.99	— 0.19
	14	B. A. C. 411 . .	F.	24.8	28.1	30.0	37.8	40.4	43.0	50.9	52.9	56.0	16 40.43	— 1.73	. .	— 6.55	1 16 32.15	— 3.90
	15	B. A. C. 424 . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	16	η Piscium . . .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	17	ο Piscium . . .	F.	46.2	47.8	50.3	56.4	58.5	0.6	6.9	8.4	11.0	38 58.57	— 0.82	— 6.43	— 6.53	1 38 51.22	— 0.13
	18	B. A. C. 570 . .	F.	2.8	6.2	8.0	16.2	18.9	21.5	29.6	31.4	35.0	46 18.84	— 1.80	. .	— 6.55	1 46 10.49	— 3.98
	19	B. A. C. 578 . .	F.	. .	. .	. .	12.6	15.2	17.8	23.3	25.1	28.5	48 12.61	— 1.77	. .	— 6.55	1 48 4.29	— 3.95
	20	Neptune . . .	F.	4.5	7.2	8.7	14.9	16.9	19.0	25.0	26.8	29.3	57 16.92	— 0.79	. .	— 6.55	1 57 9.58	. .
	21	α Arietis	F.	5.4	8.2	9.7	16.4	18.6	20.9	27.6	29.1	32.0	0 18.66	— 0.55	— 6.47	— 6.53	2 0 11.58	— 0.05
	22	ξ^1 Ceti	F.	21.3	23.9	29.6	31.6	33.7	35.8	37.8	43.5	46.0	6 33.69	— 0.82	— 6.57	— 6.53	2 6 26.34	+ 0.08
	23	5 Ursæ Minoris, S. P.	F.	. .	. .	14.2	5.2	57.0	48.6	39.5	. .	. .	27 56.90	— 5.03	. .	— 6.53	14 27 45.34	— 0.28
	24	Lalande 4830 . .	F.	29.9	33.0	35.0	42.5	45.3	47.9	55.4	57.4	0.7	30 45.23	— 0.21	. .	— 6.54	2 30 38.48	— 4.28
	25	γ Ceti.	F.	48.6	51.1	52.6	58.7	0.8	2.9	9.0	10.5	13.0	37 0.80	— 0.92	— 6.56	— 6.53	2 36 53.35	+ 0.03
	26	B. A. C. 853 . .	F.	. .	. .	. .	41.5	44.3	46.9	52.2	54.2	57.9	38 41.50	— 1.83	. .	— 6.54	2 38 33.13	— 3.96
	27	β Ursæ Minoris, S. P.	F.	59.2	49.3	43.9	20.7	12.8	5.0	41.9	36.6	26.8	51 12.91	— 4.60	. .	— 6.53	14 51 1.78	— 0.34
	28	α Ceti.	F.	43.8	46.5	47.9	54.1	56.2	58.2	4.2	5.8	8.3	55 56.11	— 0.90	— 6.52	— 6.53	2 55 48.68	+ 0.01
	29	ζ Arietis	F.	41.5	44.0	45.8	52.2	54.4	56.6	3.0	4.5	7.4	7 54.38	— 0.59	— 6.54	— 6.53	3 7 47.24	— 0.05
	30	Clotho	F.	7.9	10.6	12.0	18.1	20.2	22.4	28.6	30.0	32.6	11 20.27	— 1.04	. .	— 6.54	3 11 12.69	. .
29	31	γ Tauri	P.	39.3	42.0	43.7	50.0	52.0	54.2	0.6	2.2	4.8	12 52.09	— 0.65	— 6.29	— 6.47	4 12 44.97	— 0.17
	32	B. A. C. 1373 . .	P.	33.9	36.6	38.2	44.9	47.0	49.2	55.8	57.5	0.1	20 47.02	— 0.54	. .	— 6.27	4 20 40.21	— 4.41
	33	B. A. C. 1388 . .	P.	56.5	59.3	0.9	7.3	9.4	11.7	18.0	19.7	22.5	23 9.48	— 0.58	. .	— 6.28	4 23 2.62	— 4.37
	34	A Draconis, S. P. .	P.	47.3	43.0	31.8	25.9	20.4	14.4	8.9	57.4	52.9	28 20.22	— 3.06	. .	— 6.47	16 28 10.69	— 0.27
	35	Lutetia	P.	53.0	55.8	57.4	3.9	6.2	8.4	14.8	16.4	19.3	42 6.13	— 0.55	. .	— 6.37	4 41 59.21	. .
	36	ι Aurigæ. . . .	P.	48.3	51.3	53.1	0.5	2.9	5.3	12.6	14.5	17.5	49 2.89	— 0.32	— 6.44	— 6.47	4 48 56.10	— 0.07
	37	ε Ursæ Minoris, S. P.	P.	. .	. .	. .	. .	35.3	20.3	49.4	38.7	18.8	58 50.22	— 7.12	. .	— 6.47	16 58 36.63	+ 0.07
	38	B. A. C. 1574 . .	P.	. .	. .	. .	. .	12.8	15.2	20.2	21.9	25.1	0 10.10	— 1.55	. .	— 6.44	5 0 2.11	— 3.61
	39	B. A. C. 1599 . .	P.	. .	. .	56.6	59.4	2.0	4.5	9.4	. .	14.7	3 59.40	— 1.55	. .	— 6.45	5 3 51.40	— 3.60
	40	B. A. C. 1644 . .	P.	45.8	48.7	50.5	57.7	0.3	2.9	10.0	11.8	14.9	12 0.29	— 1.50	. .	— 6.48	5 11 52.31	— 3.58
	41	β Tauri	P.	21.0	23.9	25.7	32.6	35.0	37.3	44.2	46.0	48.9	18 34.96	— 0.41	— 6.40	— 6.47	5 18 28.08	— 0.09
	42	δ Orionis. . . .	P.	36.4	38.9	40.5	46.6	48.7	50.8	56.8	58.4	0.8	.25 48.66	— 0.90	— 6.53	— 6.47	5 25 41.29	+ 0.03
	43	α Leporis. . . .	P.	11.6	14.4	16.0	. .	. .	. .	. .	. .	. .	27 24.55	— 1.18	— 6.60	— 6.47	5 27 16.90	+ 0.09
	44	ε Orionis. . . .	P.	. .	. .	. .	3.6	5.8	7.6	11.8	13.3	16.0	30 3.64	— 0.91	— 6.54	— 6.47	5 29 56.26	+ 0.06
	45	ε Bootis	Sk.	25.7	28.6	30.5	37.3	39.6	42.0	48.8	50.4	53.4	39 39.59	— 0.44	— 6.27	— 6.20	14 39 32.95	+ 0.05
	46	β Bootis	Sk.	5.1	8.5	10.4	18.6	21.3	24.0	32.2	34.0	37.6	57 21.30	— 0.06	. .	— 6.20	14 57 15.04	+ 0.08
	47	α Coronæ Borealis .	Sk.	17.8	20.6	22.4	29.1	31.6	33.9	40.6	42.4	45.2	29 31.51	— 0.45	— 6.37	— 6.20	15 29 24.86	+ 0.17
	48	α Serpentis . . .	Sk.	2.9	5.3	6.8	13.1	15.2	17.4	23.3	25.0	27.5	38 15.17	— 0.89	— 6.29	— 6.20	15 38 8.08	+ 0.11
30	49	Sun I, N. . . .	Sk.	11.6	14.6	15.9	22.9	24.9	27.0	33.4	35.3	38.1	24 24.86	— 1.48	. .	— 6.29	16 24 17.09	. .
	50	Sun II, S. . . .	Sk.	32.2	34.8	36.6	43.2	45.4	47.4	54.1	55.6	58.4	26 45.30	— 1.48	. .	— 6.29	16 26 37.53	. .

10, 11, 23, 27, 34, 37. Bisections at sets B and D.
24, 30, 35. Wire A used.
24. Telescope micrometer revolutions may be 36.
46. Temperatures and barometer read at $15^h\ 25^m$. Attached thermometer reduced for 24°.8.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	28 38	9 25.0	21.1	1.8	27.0	34	. .	428	. .	458	. .	29.3	28 42 0.1	. .	+ 33.0	79 48 54.3	+ 1.0
2	132 48	22.2	18.8	29.2	27.2	30	658	664	. .	. .	. .	29.3	132 52 59.5	. .	− 1 4.8	98 14 26.5	+ 2.4
3	47 4	23.8	19.6	0.2	26.0	38	. .	. .	. .	534	540	29.3	47 6 58.9	. .	+ 1 4.8	98 14 24.9	+ 0.8
4	69 4	22.6	18.0	27.7	25.5	34	. .	. .	. .	812	818	29.3	69 7 57.1	. .	+ 2 37.0	120 16 55.3	− 0.4
5	24 18	10 0.8	26.5	7.5	1.5	38	. .	654	. .	676	. .	29.3	24 20 50.1	38.8	+ 27.3	75 27 38.6	+ 1.4
6	32 38	0.5	25.8	6.6	0.8	32	. .	698	. .	726	. .	29.3	32 42 21.8	. .	+ 38.9	83 49 21.9	+ 1.4
7	78 20	[illegible].4	26.0	4.2	1.7	37	364	404	. .	. .	. .	29.3	78 23 9.6	. .	+ 4 47.6	129 34 18.4	+ 8.0
8	41 44	9 29.0	23.6	4.6	0.2	36	. .	. .	. .	150	158	29.3	41 47 31.0	. .	+ 54.1	92 54 46.3	+19.7
9	74 36	10 3.2	27.0	5.5	3.2	34	. .	. .	. .	594	624	29.3	74 39 51.4	36.5	+ 3 37.8	125 49 50.4	+ 9.3
10	289 20	3.0	28.8	7.8	5.0	31	612	608	. .	616	608	29.3	289 24 35.8	. .	− 2 50.9	340 27 56.1	+ 0.1
11	324 32	2.7	28.2	7.9	4.4	35	894	898	. .	904	910	29.3	324 35 30.8	. .	− 43.1	15 41 8.9	− 1.7
12	31 36	1.3	26.6	6.8	2.4	35	. .	530	. .	564	. .	29.3	31 39 37.6	. .	+ 37.8	82 46 36.6	+ 1.3
13	310 12	3.8	28.4	8.4	5.0	35	150	158	110	120	124	29.3	310 15 42.0	. .	− 1 11.7	1 20 51.5	− 0.4
14	76 28	1.5	23.6	2.8	0.7	35	. .	. .	. .	642	650	29.3	76 31 38.1	. .	+ 4 8.6	127 42 7.9	+12.6
15	71 14	2.4	26.0	5.8	2.3	33	. .	. .	. .	552	566	29.3	71 18 8.2	. .	+ 2 58.0	122 27 27.4	+14.0
16	24 8	9 28.5	24.2	4.9	0.5	39	. .	298	. .	314	. .	29.3	24 10 42.3	. .	+ 27.3	75 17 30.8	+ 0.7
17	30 18	10 1.5	26.8	6.1	2.7	38	. .	082	. .	098	.	29.3	30 20 58.6	. .	+ 35.6	81 27 55.4	+ 0.4
18	79 12	3.5	27.3	6.6	4.2	36	. .	. .	. .	206	214	29.3	79 15 26.2	. .	+ 5 11.8	130 26 59.2	+13.3
19	77 58	2.6	29.8	9.2	5.7	35	. .	. .	. .	924	930	29.3	78 1 29.1	34.4	+ 4 40.5	129 12 30.8	+13.6
20	28 46	9 28.8	24.5	5.0	0.9	34	. .	740	. .	766	. .	29.3	28 49 51.7	. .	+ 33.5	79 56 46.4	. .
21	15 58	10 1.0	27.4	8.1	2.1	39	. .	214	. .	226	. .	29.3	16 0 41.1	. .	+ 17.5	67 7 19.8	+ 0.7
22	30 34	2.8	28.0	7.9	3.8	37	. .	610	. .	620	. .	29.3	30 27 4.6	. .	+ 35.8	81 34 1.6	− 0.4
23	295 6	9 29.3	25.0	4.6	1.6	32	. .	. .	. .	444	442	29.3	295 10 26.6	. .	− 2 9.1	346 14 38.7	+ 2.3
24	1 36	29.3	26.3	6.0	1.6	35	. .	954	. .	958	. .	29.3	1 42 5.4	. .	+ 1.8	52 48 28.4	+27.7
25	36 6	28.2	22.8	3.8	28.8	34	. .	096	. .	106	. .	29.3	36 10 3.1	. .	+ 44.6	87 17 8.9	+ 0.1
26	79 48	10 2.3	26.2	5.3	0.6	35	. .	. .	. .	980	000	29.3	79 51 31.3	. .	+ 5 29.8	131 3 22.3	+15.2
27	293 32	4.5	29.2	8.4	3.2	35	848	866	. .	854	860	29.3	293 35 30.5	. .	− 2 18.9	344 39 32.8	+ 1.3
28	35 12	1.0	25.8	6.8	0.4	31	. .	. .	. .	. .	440	29.3	35 16 41.7	. .	+ 43.2	86 23 46.1	+ 1.2
29	18 14	1.4	28.2	8.5	2.0	33	466	494	. .	. .	. .	29.3	18 18 8.3	33.5	+ 20.2	69 24 49.7	+ 1.6
30	43 10	2.0	26.4	6.7	0.4	34	. .	415	. .	425	. .	29.3	43 16 28.1	. .	+ 57.4	94 23 46.7	− 5.6
31	23 30	0.3	26.9	7.5	2.1	36	475	470	. .	435	440	32.5	23 33 27.0	23.4	+ 27.1	74 40 15.3	+ 1.6
32	17 28	1.5	29.3	8.3	2.5	31	435	420	. .	480	495	32.5	17 32 42.4	. .	+ 19.6	68 39 23.2	+18.6
33	19 16	2.6	28.2	9.8	3.6	38	. .	. .	. .	015	980	32.5	19 19 1.9	. .	+ 21.8	70 25 44.9	+18.4
34	287 54	9 29.7	25.3	5.2	1.4	30	625	705	. .	. .	. .	32.5	287 58 56.6	. .	− 3 9.8	339 2 8.0	+ 3.7
35	17 28	10 2.8	28.5	8.5	3.5	34	. .	840	. .	980	. .	32.5	17 34 21.9	. .	+ 19.7	68 41 2.8	− 1.8
36	5 52	1.5	28.6	8.9	3.0	36	. .	845	. .	805	. .	32.5	5 55 20.1	. .	+ 6.5	57 1 47.8	+ 1.5
37	301 6	2.4	27.9	7.8	4.5	35	. .	. .	. .	750	795	32.5	301 9 35.6	. .	− 1 42.7	352 14 14.1	+ 2.0
38	74 38	4.8	27.4	8.2	2.8	32	. .	. .	. .	320	295	32.5	74 42 28.7	. .	+ 3 44.6	125 52 34.5	+16.6
39	74 38	4.8	27.4	8.2	2.8	32	. .	. .	. . .	250	272	32.5	74 42 29.4	. .	+ 3 44.6	125 52 35.2	+16.5
40	72 28	2.3	26.5	6.0	3.0	39	. .	. .	. .	445	410	32.5	72 30 41.1	. .	+ 3 15.7	123 40 18.0	+16.4
41	10 20	2.4	28.9	9.3	2.8	36	. .	935	. .	960	. .	32.5	10 23 17.8	. .	+ 11.4	61 29 50.4	+ 1.7
42	39 12	2.5	27.5	8.7	2.5	33	470	475	. .	. .	. .	32.5	39 16 11.1	. .	+ 51.0	90 23 23.3	+ 1.0
43	56 42	2.0	26.4	8.0	2.0	31	760	755	. .	. .	. .	32.5	56 46 37.9	. .	+ 1 35.0	107 54 34.1	+ 2.3
44	40 6	3.3	29.1	10.5	4.1	35	. .	800	. .	835	. .	32.5	40 9 34.1	21.8	+ 52.6	91 16 47.9	+ 1.5
45	11 14	9 29.9	29.2	11.5	3.5	35	. .	254	. .	. .	. .	30.0	11 17 40.9	. .	+ 12.6	62 24 14.7	+ 2.6
46	357 56	10 0.3	0.9	10.6	3.4	30	. .	. .	. .	144	118	30.0	358 0 59.9	20.2	− 2.2	49 7 18.9	+ 1.5
47	11 42	9 28.7	28.0	10.5	2.0	35	. .	. .	. .	908	906	30.0	11 45 32.8	. .	+ 13.1	62 52 7.1	+ 2.2
48	32 0	10 1.5	29.6	10.5	3.3	33	. .	. .	. .	890	920	30.0	32 4 1.8	. .	+ 39.3	83 11 2.3	+ 1.7
49	60 12	3.0	29.0	10.1	3.8	32	006	070	. .	. .	. .	30.0	60 16 29.5	. .	+ 1 49.1	111 24 39.8	. .
50	60 46	3.6	0.3	11.2	3.8	37	. .	. .	. .	856	020	30.0	60 48 58.6	21.6	+ 1 51.5	111 57 11.3	. .

No.	Barom.	At Ther.
	in.	°
5	30.35	41.5
9	30.35	40.0
19	30.37	37.4
29	30.36	36.5
31	30.27	27.1
44	30.27	24.7
46	30.35	34.8
50	30.32	25.6

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
20	− 0.1	. .	. .	− 0.1
49	− 7.8	+ 16 15.7	. .	+ 16 7.9
50	− 7.9	− 16 15.7	. .	− 16 23.6

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Nov. 30	1	Venus I, S. . .	Sk.	49.4	52.1	53.6	. .	. .	. .	11.7	13.3	16.3	40 2.73	− 1.54	. .	− 6.27	17 39 54.92	+ 0.48
	2	Venus II, N. . .	Sk.	. .	. .	59.3	1.3	3.6	5.8	8.2	. .	. .	40 3.64	− 1.54	. .	− 6.27	17 39 55.83	− 0.43
	3	α Lyræ	Sk.	33.2	36.6	38.6	46.2	48.8	51.4	59.5	1.4	4.6	32 48.92	− 0.13	− 6.22	− 6.19	18 32 42.60	+ 0.05
	4	γ Pegasi	Sk.	45.4	48.0	49.5	56.0	58.0	0.0	6.2	7.8	10.6	6 57.94	− 0.71	− 6.15	− 6.19	0 6 51.04	− 0.03
	5	β Ceti	Sk.	16.9	19.6	21.2	27.7	29.9	32.0	38.5	40.2	42.7	37 29.86	− 1.41	− 6.09	− 6.19	0 37 22.26	− 0.05
	6	Polaris	Sk.	. .	. .	58.0	. .	51.0	18.5	43.5	. .	. .	12 50.96	+45.59	. .	− 6.19	1 13 30.36	− 0.22
	7	B. A. C. 411 . .	Sk.	. .	. .	. .	. .	. .	. .	50.3	52.2	55.5	16 39.99	− 1.92	. .	− 6.14	1 16 31.93	− 3.87
	8	Neptune . . .	Sk.	49.3	51.9	53.4	59.7	1.5	3.7	10.0	11.4	14.0	57 1.66	− 0.80	. .	− 6.13	1 56 54.71	. .
	9	α Arietis	Sk.	4.9	7.6	9.4	16.0	18.3	20.5	27.0	28.8	31.6	0 18.23	− 0.52	− 6.08	− 6.19	2 0 11.52	− 0.10
	10	Ianthe	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	11	γ Ceti.	Sk.	48.2	50.7	52.3	58.5	0.4	2.4	8.6	10.2	12.7	37 0.44	− 0.95	− 6.16	− 6.18	2 36 53.31	− 0.02
	12	α Ceti.	Sk.	43.6	46.1	47.5	53.6	55.7	57.9	3.9	5.5	8.0	55 55.76	− 0.94	− 6.12	− 6.18	2 55 48.64	− 0.04
	13	Egeria	Sk.	31.7	34.7	36.4	43.3	45.5	47.7	54.6	56.5	59.1	4 45.50	− 0.49	. .	− 6.11	3 4 38.90	. .
	14	B. A. C. 1021 . .	Sk.	35.4	38.7	40.6	48.2	50.8	53.3	0.9	2.7	6.0	11 50.73	− 1.88	. .	− 6.11	3 11 42.74	− 3.87
	15	B. A. C. 1373 . .	Sk.	33.7	36.3	38.0	44.5	46.7	49.0	55.5	57.3	59.9	20 46.77	− 0.56	. .	− 6.09	4 20 40.12	− 4.43
	16	α Tauri	Sk.	43.3	46.0	47.6	54.0	56.1	58.2	4.6	6.0	8.8	28 56.07	− 0.67	− 6.13	− 6.18	4 28 49.22	− 0.07
	17	Lutetia	Sk.	45.5	48.3	49.8	56.7	58.8	1.0	7.7	9.4	12.1	40 58.81	− 0.56	. .	− 6.08	4 40 52.17	. .
	18	ι Aurigæ . . .	Sk.	48.2	51.3	52.9	0.1	2.5	4.9	12.3	14.2	17.0	49 2.60	− 0.27	− 6.20	− 6.18	4 48 56.15	− 0.02
	19	η Bootis	E.	39.8	42.6	44.1	50.4	52.7	54.9	1.3	3.1	5.7	48 52.73	− 0.60	− 6.52	− 6.53	13 48 45.60	− 0.06
	20	α Bootis	E	53.1	56.0	57.5	4.1	6.2	8.4	14.9	16.5	19.3	10 6.22	− 0.58	− 6.60	− 6.53	14 9 59.11	+ 0.07
Dec. 1	21	α Lyræ	E.	33.7	36.9	38.8	46.6	49.4	52.0	59.7	1.8	5.0	32 49.32	− 0.13	− 6.64	− 6.59	18 32 42.60	+ 0.07
	22	β Lyræ	E.	. .	. .	30.1	32.6	35.3	37.7	40.1	. .	. .	45 35.16	− 0.28	− 6.51	− 6.59	18 45 28.29	− 0.05
	23	Moon I . . .	E.	17.8	20.9	22.6	29.8	32.1	34.4	41.5	43.1	46.0	33 32.02	− 1.51	. .	− 6 56	19 33 23.95	+68.89
	24	γ Aquilæ . . .	E.	15.4	18.1	19.6	25.6	27.8	29.9	36.1	37.6	40.3	40 27.82	− 0.77	− 6.57	− 6.60	19 40 20.45	0.00
	25	α Aquilæ . . .	E.	37.6	40.3	41.8	48.0	50.0	52.0	58.3	59.8	2.4	44 50.02	− 0.81	− 6.59	− 6.60	19 44 42.51	− 0.07
	26	α Coronæ Borealis .	F.	18.3	21.0	22.8	29.6	31.9	34.3	41.3	42.9	45.9	29 32.00	− 0.43	− 6.85	− 6.83	15 29 24.74	+ 0.02
	27	α Serpentis . . .	F.	3.5	6.0	7.6	11.7	15.8	19.9	24.0	25.5	28.0	38 15.78	− 0.84	− 6.91	− 6.83	15 38 8.11	+ 0.10
	28	Mercury II . .	F.	27.6	30.4	31.9	38.5	40.6	42.7	49.3	50.9	53.5	40 40.60	− 1.32	. .	− 6.88	15 40 32.40	− 0.18
2	29	Sun I, N. . . .	F.	. .	. .	59.8	1.9	4.0	6.2	8.3	. .	. .	33 4.04	− 1.39	. .	− 6.88	16 32 55.77	. .
	30	Sun II, S. . . .	F.	12.0	15.0	16.3	22.5	24.7	27.0	33.9	35.4	38.2	35 25.00	− 1.39	. .	− 6.88	16 35 16.73	. .
	31	η Serpentis . . .	F.	47.8	50.5	51.8	55.9	58.0	0.1	2.3	4.4	. .	15 0.12	− 1.02	− 7.14	− 6.86	18 14 52.24	+ 0.34
	32	α Lyræ	F.	34.0	37.3	39.2	47.1	49.7	52.3	0.1	2.0	5.4	32 49.68	− 0.14	− 6.99	− 6.86	18 32 42.68	+ 0.15
	33	ζ Aquilæ . . .	F.	36.2	38.8	40.3	46.6	48.6	51.0	57.0	58.7	1.3	59 48.72	− 0.71	− 6.92	− 6.87	18 59 41.14	+ 0.13
	34	γ Aquilæ . . .	F.	15.7	18.3	19.8	26.0	28.0	30.1	36.5	37.9	40.6	40 28.10	− 0.78	− 6.84	− 6.88	19 40 20.44	− 0.01
	35	α Aquilæ . . .	F.	38.0	40.5	42.0	48.1	50.2	52.3	58.6	0.0	2.7	44 50.27	− 0.81	− 6.84	− 6.88	19 44 42.58	0.00
	36	β Aquilæ . . .	F.	7.4	10.0	11.6	17.7	19.9	21.8	28.0	29.6	32.0	49 19.78	− 0.85	− 6.95	− 6.88	19 49 12.05	+ 0.10
	37	Moon I . . .	F.	45.9	48.9	50.5	57.5	59.8	2.0	8.7	10.5	13.3	26 59.68	− 1.44	. .	− 6.88	20 26 51.36	+67.65
	38	B. A. C. 2 . . .	F.	. .	. .	49.4	51.8	54.4	56.9	59.4	. .	. .	1 54.38	− 1.71	. .	− 6.88	0 1 45.79	− 3.59
	39	21 Cassiopeæ . . .	F.	. .	. .	. .	33.7	41.3	. .	3.9	9.6	19 0	37 33.69	+ 2.54	. .	− 6.93	0 37 29.30	+ 0.15
	40	ε Piscium . . .	F.	26.2	28.9	30.3	36.5	38.5	40.6	46.7	48.0	51.0	56 38.52	− 0.87	− 6.84	− 6.93	0 56 30.72	− 0.07
	41	Polaris	F.	. .	. .	1.0	27.0	55.5	23.0	50.0	. .	. .	12 55.30	+40.85	. .	− 6.93	1 13 29 22	0.00
	42	B. A. C. 424 . .	F.	20 8	23.7	25.7	32.8	35.3	37.7	45.0	46.8	50.0	18 35.31	− 1.66	. .	− 6.88	1 18 26.77	− 3.76
	43	38 Cassiopeæ . . .	F.	. .	. .	. .	1.8	7.7	13.5	19.4	. .	. .	22 7.67	+ 1.69	. .	− 6.94	1 22 2.42	+ 0.24
	44	ο Piscium . . .	F.	46.6	49.2	50.8	56.9	59.0	1.1	7.3	8.8	11.4	38 59.01	− 0.84	− 6.86	− 6.94	1 38 51.23	− 0.11
	45	β Arietis	F.	42.5	45.2	46.8	53.2	55.4	57.6	4.1	5.8	8.5	47 55.46	− 0.62	− 6.86	− 6.94	1 47 47.90	− 0.06
	46	Neptune . . .	F.	40.6	43.3	44.8	51.0	53.0	55.3	1.3	2.9	5.5	56 53.08	− 0.82	. .	− 6.88	1 56 45.38	. .
	47	α Arietis	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	48	5 Ursæ Minoris, S.P.	F.	48.7	37.8	31.0	13.5	5.5	. .	. .	. .	. .	27 56.76	− 4.97	. .	− 6.95	14 27 44.84	− 0.99
	49	γ Ceti	F.	49.0	51.5	53.0	59.0	1.2	3.2	9.3	10.8	13.4	37 1.16	− 0.95	− 6.88	− 6.95	2 36 53.26	− 0.07

10, 13, 17. Wire A used.
38, 39, 43, 48. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS. I.	II.	III.	IV.	TELESCOPE MICROMETER. Rev.	1.	2.	3.	4.	5.	Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	63 2	10 1.5	3.8	9.2	1.6	36	. .	134	. .	850	. .	30.0	63 5 29.0	. .	+ 2 2.4	114 13 52.6	. .
2	63 2	1.5	3.8	9.2	1.6	36	898	. .	. .	. .	842	30.0	63 5 15.4	. .	+ 2 2.4	114 13 39.0	. .
3	0 10	5.3	3.4	15.0	5.2	35	. .	740	. .	760	. .	30.0	0 13 29.9	22.5	+ 0.2	51 19 51.3	+ 0.5
4	24 20	1.1	28.5	8.5	0.8	36	. .	312	. .	290	. .	30.2	24 23 26.5	19.3	+ 28.4	75 30 16.1	+ 0.9
5	57 28	0.7	27.5	8.5	2.5	33	. .	568	. .	600	. .	30.2	57 32 7.8	. .	+ 1 38.5	108 40 7.5	+ 0.7
6	310 12	2.9	0.0	10.0	4.1	35	. .	000	. .	990	. .	30.2	310 15 44.5	. .	— 1 14.2	1 20 51.5	+ 0.6
7	76 28	0.5	25.5	6.5	2.5	36	. .	. .	. .	102	150	30.2	76 31 30.0	17.9	+ 4 17.8	127 42 9.0	+12.0
8	28 48	9 28.5	26.0	6.4	29.8	37	860	868	. .	. .	. .	30.2	28 51 4.3	. .	+ 34.7	79 58 0.2	. .
9	15 58	28.8	27.2	6.4	1.6	39	. .	466	. .	480	. .	30.2	16 0 39.2	. .	+ 18.1	67 7 18.5	— 0.4
10	1 50	10 1.0	26.2	8.8	1.3	38	. .	620	. .	880	. .	30.2	1 55 22.5	. .	+ 2.1	53 1 45.8	— 0.1
11	36 6	2.2	28.5	9.1	2.4	33	. .	948	. .	004	. .	30.2	36 10 1.2	. .	+ 46.0	87 17 8.4	— 0.6
12	35 12	2.9	28.9	9.2	3.1	31	488	468	. .	. .	. .	30.2	35 16 38.7	. .	+ 44.5	86 23 44.4	— 0.7
13	14 12	3.8	0.7	12.7	4.3	37	. .	192	. .	330	. .	30.2	14 17 41.6	. .	+ 16.0	65 24 18.8	— 1.4
14	74 56	2.0	25.5	7.0	1.0	39	. .	482	. .	469	. .	30.2	74 58 38.4	17.0	+ 3 51.2	126 8 50.8	+16.0
15	17 28	9 29.5	26.4	7.5	29.4	31	482	586	. .	. .	. .	30.2	17 32 40.8	. .	+ 19.9	68 39 21.9	+18.6
16	22 34	10 2.8	0.6	11.1	3.2	35	710	730	. .	. .	. .	30.2	22 37 32.9	. .	+ 26.2	73 44 20.3	+ 1.0
17	17 28	0.5	27.5	8.8	1.8	31	. .	800	. .	995	. .	30.2	17 35 6.9	. .	+ 20.0	68 41 48.1	— 1.8
18	5 52	9 29.8	28.3	8.8	0.7	36	. .	770	. .	830	. .	30.2	5 55 19.3	16.5	+ 6.5	57 1 47.0	+ 0.8
19	19 48	25.0	22.7	6.3	25.0	33	. .	885	. .	945	. .	30.2	19 52 8.0	21.5	+ 22.5	70 58 51.7	+ 1.7
20	19 0	10 7.3	3.3	17.8	9.0	35	. .	. .	. .	130	170	30.2	19 3 37.4	. .	+ 21.5	70 10 10.1	+ 1.5
21	0 10	10.9	7.0	22.3	13.9	35	. .	170	. .	320	. .	30.1	0 13 31.5	28.8	+ 0.2	51 19 52.9	+ 1.7
22	5 36	2.5	0.4	12.4	5.3	32	. .	. .	. .	370	470	30.1	5 40 23.5	. .	+ 6.1	56 46 50.8	+ 1.5
23	66 15	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
24	28 30	4.0	0.7	13.3	5.7	32	. .	145	. .	275	. .	30.1	28 34 25.3	. .	+ 33.3	79 41 19.8	+ 1.8
25	30 16	9 28.5	24.8	7.4	0.0	31	. .	830	. .	840	. .	30.1	30 20 36.8	. .	+ 35.8	81 27 33.8	+ 2.5
26	11 42	10 5.3	0.2	12.8	7.2	35	. .	. .	. .	634	644	28.7	11 45 31.5	. .	+ 12.8	62 52 5.5	0.0
27	32 0	3.2	28.4	9.5	3.1	33	800	816	. .	. .	. .	28.7	32 4 1.5	. .	+ 38.6	83 11 1.3	+ 0.3
28	57 34	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
29	60 32	9 28.2	23.8	5.0	29.2	37	894	930	. .	. .	. .	28.7	60 35 3.1	28.4	+ 1 49.2	111 43 13.5	. .
30	61 4	27.9	22.4	4.9	29.2	36	. .	. .	. .	150	134	28.7	61 7 31.0	. .	+ 1 51.7	112 15 43.9	. .
31	41 44	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
32	0 10	10 2.4	28.0	9.6	2.8	35	. .	862	. .	886	. .	28.7	0 13 30.8	. .	+ 0.2	51 19 52.2	+ 0.8
33	25 8	9 29.9	26.5	9.0	1.6	32	. .	534	. .	552	. .	28.7	25 12 23.0	31.6	+ 28.9	76 19 13.1	+ 0.5
34	28 30	10 1.5	27.6	9.4	3.2	32	. .	384	. .	390	. .	28.7	28 34 24.2	. .	+ 33.5	79 41 18.9	+ 0.7
35	30 16	9 23.0	24.8	6.2	0.0	31	. .	830	. .	860	. .	28.7	30 20 37.0	. .	+ 36.0	81 27 34.2	+ 2.8
36	32 44	10 0.6	26.4	9.6	2.2	37	. .	308	. .	322	. .	28.7	32 47 9.5	. .	+ 39.6	83 54 10.3	+ 1.0
37	63 20	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
38	73 0	4.4	27.8	9.9	4.6	35	256	300	. .	. .	. .	30.3	73 3 40.1	26.1	+ 3 21.8	124 13 23.1	+ 9.1
39	324 32	9 29.9	26.5	7.5	2.0	36	. .	. .	. .	010	016	30.3	324 35 32.0	. .	— 44.2	15 41 9.0	— 0.5
40	31 36	29.7	25.5	6.8	0.0	35	. .	740	. .	750	. .	30.3	31 39 36.8	. .	+ 38.3	82 46 36.3	+ 0.8
41	310 12	28.5	24.0	5.9	0.8	35	462	410	432	426	420	30.3	310 15 42.4	26.1	— 1 13.4	1 20 50.2	— 0.1
42	71 14	10 3.5	27.5	8.8	2.9	33	. .	. .	. .	602	614	30.3	71 18 7.3	. .	+ 3 2.2	122 27 30.7	+13.1
43	329 12	0.1	27.2	8.5	2.3	32	. .	. .	. .	328	318	30.3	329 16 27.9	. .	— 37.0	20 22 12.1	+ 0.3
44	30 18	2.2	27.7	8.3	3.3	38	. .	096	. .	120	. .	30.3	30 20 58.3	. .	+ 36.4	81 27 55.9	+ 0.8
45	18 38	9 25.3	22.7	4.8	27.5	38	. .	056	. .	080	. .	30.3	18 41 4.2	26.1	+ 21.0	69 47 46.4	+ 0.5
46	28 48	24.9	20.4	2.3	25.3	35	. .	. .	. .	090	104	30.3	28 51 51.9	. .	+ 34.3	79 58 47.4	. .
47	15 58	21.0	18.2	1.1	24.1	39	. .	. .	. .	866	. .	30.3	16 0 41.0	. .	+ 17.8	67 7 20.0	+ 1.1
48	295 6	10 3.2	28.2	9.5	4.1	32	232	242	. .	. .	. .	30.3	295 10 26.9	. .	— 2 11.8	346 14 36.3	+ 1.8
49	36 6	1.1	24.8	7.1	0.8	34	. .	084	. .	104	. .	30.3	36 10 1.6	. .	+ 45.5	87 17 8.3	— 0.9

No.	Barom.	At. Ther.
	in.	°
3	30.27	29.8
4	30.28	22.3
7	30.28	21.7
14	30.23	21.0
18	30.22	20.1
19	30.19	22.5
21	30.15	36.0
29	30.43	31.8
33	30.43	35.0
38	30.45	29.0
41	30.47	29.0
45	30.45	29.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
1	— 4.9	— 6.8	0.0	— 11.7
2	— 4.9	+ 6.8	. .	+ 1.9
8	— 0.1	. .	. .	— 0.1
29	— 7.8	+ 16 15.2	. .	+ 16 7.4
30	— 7.8	— 16 15.2	. .	— 16 23.0
46	— 0.1	. .	. .	— 0.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Dec. 2	1	B. A. C. 872	F.	35.7	38.3	40.2	47.0	49.3	51.5	58.4	0.2	3.0	42 49.29	− 0.48	. .	− 6.88	2 42 41.93	− 4.14
	2	B. A. C. 886	F.	8.9	12.0	14.0	21.6	24.2	26.8	34.5	36.2	39.3	45 24.17	− 1.77	. .	− 6.88	2 45 15.52	− 3.88
	3	α Ceti	F.	44.3	46.9	48.4	54.5	56.6	58.6	4.8	6.2	8.8	55 56.57	− 0.94	− 6.92	− 6.95	2 55 48.68	− 0.01
	4	B. A. C. 953	F.	6.3	9.7	11.5	19.3	22.0	24.5	32.2	34.3	37.6	57 21.93	− 0.20	. .	− 6.88	2 57 14.85	− 4.53
	5	Egeria	F.	25.0	27.7	29.6	36.3	38.6	40.8	47.4	49.3	52.2	2 38.51	− 0.53	. .	− 6.88	3 2 31.13	. .
	6	δ Persei	F.	55.8	59.7	1.8	. .	. .	. .	26.0	28.3	32.0	34 13.93	+ 0.10	. .	− 6.96	3 34 7.07	+ 0.06
	7	η Tauri	F.	1.7	4.6	6.2	13.0	15.3	17.3	24.0	25.7	28.5	40 15.14	− 0.55	− 6.84	− 6.96	3 40 7.63	− 0.12
	8	ζ Persei	F.	. .	. .	23.8	26.0	28.6	31.0	33.3	. .	. .	46 28.54	− 0.37	− 6.91	− 6.96	3 46 21.21	− 0.06
	9	γ^1 Eridani	F.	11.3	14.0	15.4	21.8	23.9	26.0	32.3	34.0	36.8	52 23.94	− 1.25	− 6.91	− 6.96	3 52 15.73	− 0.01
10	10	B. A. C. 8376	Sk.	59.5	2.8	4.8	12.9	15.8	18.4	26.5	28.6	32.0	1 15.70	− 2.17	. .	− 8.00	0 1 5.53	− 3.62
	11	B. A. C. 24	Sk.	21.1	24.0	26.0	33.6	36.1	38.7	46.3	48.0	51.3	5 36.12	− 2.00	. .	− 8.00	0 5 26.12	− 3.52
	12	β Ceti	Sk.	19.0	21.7	23.2	29.7	31.9	34.0	40.5	42.0	44.6	37 31.84	− 1.54	− 8.0	− 8.09	0 37 22.21	0.00
	13	Polaris	Sk.	5.5	52.0	56.5	51.0	14.5	. .	8.0	36.0	. .	12 43.71	+47.92	. .	− 8.10	1 13 23.53	− 0.26
	14	β Arietis	Sk.	43.7	46.4	48.0	54.5	56.7	58.8	5.4	7.2	9.9	47 56.73	− 0.72	− 8.07	− 8.10	1 47 47.91	− 0.01
	15	Neptune	Sk.	. .	. .	16.7	18.6	20.6	22.7	24.8	. .	. .	56 20.68	− 0.91	. .	− 8.08	1 56 11.66	. .
	16	α Arietis	Sk.	7.0	9.8	11.5	18.1	20.3	22.5	29.2	30.8	33.7	0 20.32	− 0.65	− 8.07	− 8.10	2 0 11.57	− 0.02
	17	Moon I, S.	Sk.	38.5	41.4	43.1	49.8	52.2	54.5	1.4	3.0	5.8	23 52.19	− 0.67	. .	− 8.14	3 23 43.38	+75.54
	18	η Tauri	Sk.	3.3	6.0	7.8	12.2	14.5	. .	. .	. .	. .	40 16.69	− 0.63	− 8.27	− 8.12	3 40 7.94	+ 0.15
	19	ζ Persei	Sk.	15.5	18.4	20.3	27.4	29.8	32.3	39.4	41.0	44.4	46 29.83	− 0.43	− 8.08	− 8.12	3 46 21.28	− 0.05
	20	γ^1 Eridani	Sk.	12.7	15.3	16.9	23.2	25.3	27.3	33.6	35.2	37.8	52 25.26	− 1.44	− 8.01	− 8.12	3 52 15.70	− 0.07
	21	ε Tauri	Sk.	19 6	22.4	23.9	30.3	32.6	34.9	41.0	42.7	45.6	21 32.56	− 0.75	− 8.21	− 8.12	4 21 23.69	+ 0.08
	22	α Tauri	Sk.	. .	. .	54.2	56.2	58.2	. .	. .	. .	. .	28 58.34	− 0.80	− 8.16	− 8.12	4 28 49.42	+ 0.02
12	23	B. A. C. 1372	P.	20.0	23.0	24.7	32.3	34.8	37.2	44.7	46.6	49.8	19 34.79	− 1.64	. .	− 8.66	4 19 24.49	− 3.80
	24	ε Tauri	P.	20.0	22.6	24.3	30.7	32.9	35.2	41.5	43.0	45.9	21 32.90	− 0.61	− 8.67	− 8.68	4 21 23.61	− 0.02
	25	α Tauri	P.	46.0	48.6	50.3	56.5	58.7	1.0	7.3	8.8	11.0	28 58.69	− 0.66	− 8.63	− 8.68	4 28 49.35	− 0.07
	26	9 Camelopardalis	P.	23.5	29.7	33.6	48.7	53.7	58.8	13.7	17.6	24.0	41 53.70	+ 1.26	. .	− 8.68	4 41 46.28	0.00
	27	ι Aurigæ	P.	50.6	53.7	55.6	2.8	5.3	7.8	15.0	16.9	20.0	49 5.30	− 0.31	− 8.67	− 8.68	4 48 56.31	− 0.05
	28	ε Ursæ Minoris, S. P.	P.	. .	. .	. .	. .	. .	. .	52.0	41.4	21.8	58 52.59	− 8.08	. .	− 8.68	16 58 35.83	− 0.34
	29	B. A. C. 1574	P.	57.6	0.6	2.5	10.2	12.6	15.0	22.6	24.5	27.8	0 12.60	− 1.68	. .	− 8.67	5 0 2.25	− 3.73
	30	B. A. C. 1588	P.	43.9	46.5	48.0	54.0	56.2	58.3	4.3	5.9	8.5	1 56.18	− 1.04	. .	− 8.67	5 1 46.47	− 4.07
	31	B. A. C. 1633	P.	2.5	5.8	7.7	15.1	17.8	20.3	27.8	29.7	33.0	10 17.74	− 1.69	. .	− 8.67	5 10 7.38	− 3.71
	32	β Tauri	P.	23.6	26.5	28.2	35.1	37.6	39.9	46.8	48.5	51.4	18 37.51	− 0.42	− 8.70	− 8.68	5 18 28.41	0.00
	33	B. A. C. 1719	P.	2.6	6.1	8.3	16.4	19.1	21.7	29.9	31.9	35.2	23 19.02	− 1.83	. .	− 8.67	5 23 8.52	− 3.64
	34	B. A. C. 1753	P.	38.3	41.2	43.2	50.5	53.3	55.9	3.0	5.1	8.0	28 53.17	− 1.67	. .	− 8.68	5 28 42.82	− 3.68
	35	B. A. C. 1773	P.	51.5	54.6	56.4	3.7	6.3	8.7	15.9	17.8	20.9	31 6.20	− 1.62	. .	− 8.68	5 30 55.90	− 3.69
	36	Moon I.	P.	23.2	26.3	28.1	35.3	37.7	40.0	47.0	48.9	51.9	43 37.60	− 0.42	. .	− 8 68	5 43 28.50	+79.67
	37	Moon II, N.	P.	2.6	5.7	7.4	14.6	17.0	19.4	26.6	28.4	31.4	46 17.01	− 0.42	. .	− 8.68	5 46 7.91	−79.74
	38	B. A. C. 1925	P.	9.6	12.4	13.8	20.5	22.7	25.0	31.5	33.3	35.9	54 22.74	− 0.54	. .	− 8.68	5 54 13.52	− 4.77
	39	B. A. C. 1930	P.	41.0	43.7	45.3	51.7	53.9	56.0	2.4	4.0	6.8	55 53.87	− 0.64	. .	− 8.68	5 55 44.55	− 4.61
	40	δ Ursæ Minoris, S. P.	P.	. .	. .	. .	. .	. .	. .	5.5	40.5	57.5	12 24.23	−17.31	. .	− 8.69	18 11 58.23	− 0.27
	41	B. A. C. 2035	P.	26.0	29.3	31.3	39.3	41.9	44.6	52.4	54.4	57.8	12 41.89	− 1.78	. .	− 8.69	6 12 31.42	− 3.51
	42	B. A. C. 2051	P.	30.7	33.6	35.3	42.4	44.7	47.0	54.3	56.0	58.8	15 44.76	− 1.53	. .	− 8.69	6 15 34.54	− 3.62
	43	B. A. C. 2063	P.	56.9	59.7	1.4	8.1	10.2	12.4	19.1	20.7	23.6	18 10.23	− 0.52	. .	− 8.69	6 18 1.02	− 4.81
	44	B. A. C. 2135	P.	35.7	38.8	40.9	46.4	51.6	57.0	2.5	4.5	7.9	27 51.70	− 1.81	. .	− 8.69	6 27 41.20	− 3.44
	45	B. A. C. 2158	P.	25.4	28.6	30.4	37.9	40.4	42.9	50.5	52.5	55.6	29 40.47	− 1.69	. .	− 8.69	6 29 30.09	− 3.49
	46	B. A. C. 2183	P.	6.3	9.3	11.0	18.2	20.5	23.0	30.4	32.0	35.0	33 20.63	− 1.59	. .	− 8.69	6 33 10.35	− 3.54
	47	B. A. C. 2195	P.	39.8	43.0	44.9	52.9	55.3	58.0	5.6	7.7	11.0	35.55.36	− 1.74	.	− 8.69	6 35 44.93	− 3.45
	48	B. A. C. 2202	P.	7.7	10.8	12.7	20.9	23.3	26.2	34.3	36.3	39.6	37 23.53	− 1.81	. .	− 8.69	6 37 13.03	− 3.41
	49	B. A. C. 2231	P.	3.3	6.4	8.4	16.1	18.7	21.3	29.2	31.0	34.0	43 18.71	− 1.74	. .	− 8.70	6 43 8.27	− 3.42
	50	B. A. C. 2246	P.	9.7	12.8	14.6	21.7	24.1	26.5	33.7	35.6	38.6	45 24.14	− 1.59	. .	− 8.70	6 45 13.85	− 3.50

5. Wire A used.
17. Wire B used.
17, 26, 28, 37. Bisections at sets B and D.
29. Bisections at set C.
40. Bisections at wires D_1, D_2, and D_3.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° '	r. "	"	"	"							"	° ' "	°	' "	° ' "	"
1	12 4	9 26.2	23.7	5.7	28.2	32	. .	. .	. .	956	960	30.3	12 8 22.1	. .	+ 13.4	63 14 56.7	+26.1
2	75 8	24.6	24.0	5.2	1.8	37	. .	. .	. .	124	134	30.3	75 11 17.1	. .	+ 3 51.9	126 21 30.2	+14.9
3	35 12	28.1	23.3	5.3	29.5	31	. .	650	. .	686	. .	30.3	35 16 40.7	. .	+ 44.1	86 23 46.0	+ 0.7
4	0 28	29.8	26.0	7.6	0.2	34	. .	. .	. .	440	470	30.3	0 31 56.9	. .	+ 0.6	51 38 18.7	+26.6
5	14 8	10 5.1	1.3	13.4	5.7	36	. .	072	. .	134	. .	30.3	14 13 58.5	25.1	+ 15.8	65 20 35.5	− 1.4
6	351 26	9 27.4	25.0	6.8	29 8	33	. .	. .	. .	300	300	30.3	351 30 15.9	. .	− 9.3	42 36 27.8	− 0.3
7	15 6	10 1.5	27.6	9.5	3.1	34	114	128	. .	. .	. .	30.3	15 9 59.1	. .	+ 16.9	66 16 37.2	+ 0.1
8	7 18	9 28.5	25.8	8.2	0.5	32	. .	240	. .	258	. .	30.3	7 22 30.3	. .	+ 8.1	58 28 59.6	− 0.6
9	52 40	10 2.2	25.8	7.4	1.2	34	468	454	. .	. .	. .	30.3	52 43 54.8	24.6	+ 1 21.9	103 51 37.9	+ 1.2
10	79 54	9 29.2	25.8	5.0	29.0	32	. .	230	. .	. .	. .	30.8	79 58 31.3	. .	+ 5 31.6	131 10 24.1	+ 6.2
11	74 36	10 3.0	27.5	7.4	2.1	34	. .	. .	. .	654	642	30.8	74 39 52.0	. .	+ 3 37.8	125 49 51.0	+ 8.0
12	57 28	0.3	27.3	9.0	0.2	33	408	402	. .	. .	. .	30.8	57 32 11.4	32.0	+ 1 35.0	108 40 7.6	− 0.2
13	310 12	2.1	0.5	9.9	4.5	35	. .	400	. .	310	. .	30.8	310 15 39.6	. .	− 1 11.4	1 20 49.4	+ 1.0
14	18 38	3.0	2.0	12.0	3.5	37	. .	590	. .	628	. .	30.8	18 41 4.2	. .	+ 20.5	69 47 45.9	0.0
15	28 50	5.6	0.7	12.5	5.2	31	. .	. .	. .	640	656	30.8	28 54 34.9	. .	+ 33.4	80 1 29.5	. .
16	15 58	3.4	1.2	12.1	2.9	39	. .	252	. .	290	. .	30.8	16 0 39.0	. .	+ 17.4	67 7 17.6	− 0.9
17	16 48	9 29.5	26.6	7.4	29.6	31	376	. .	610	. .	880	30.8	16 50 7.3	. .	+ 18.3	67 56 46.8	. .
18	15 6	10 1.5	28.7	9.2	1.3	34	236	280	. .	. .	. .	30.8	15 9 57.8	. .	+ 16.4	66 16 35.4	− 1.3
19	7 18	0.7	29.0	9.1	2.0	32	190	230	. .	. .	. .	30.8	7 22 29.2	. .	+ 7.8	58 28 58.2	− 1.2
20	52 40	3.6	27.6	9.9	1.7	34	. .	. .	. .	280	350	30.8	52 43 56.7	. .	+ 1 19.4	103 51 37.3	− 0.8
21	19 56	5.8	3.4	13.5	5.2	38	126	290	. .	. .	. .	30.8	19 58 52.9	. .	+ 22.0	71 5 36.1	+ 0.3
22	22 34	4.5	2.0	11.0	3.0	35	660	720	. .	. .	. .	30.8	22 37 33.3	32.0	+ 25.2	73 44 19.7	+ 0.2
23	73 4	9 26.7	21.6	1.7	27.2	31	645	680	. .	. .	. .	32.3	73 8 44.2	31.2	+ 3 14.7	124 18 20.1	+13.3
24	19 56	29.1	26.0	7.0	0.1	38	. .	575	. .	610	. .	32.3	19 58 55.2	. .	+ 21.7	71 5 38.1	+ 2.3
25	22 34	27.9	24.8	4.4	28.3	36	060	060	. .	130	120	32.3	22 37 35.2	. .	+ 24.9	73 44 21.3	+ 1.7
26	332 42	26.0	23.3	2.8	29.6	33	545	. .	525	. .	555	32.3	332 46 15.0	. .	− 30.7	23 52 5.5	+ 1.2
27	5 32	26.5	25.8	5.0	28.0	37	120	155	. .	175	205	32.3	5 55 19.0	. .	+ 6.2	57 1 46.4	+ 1.1
28	301 6	27.6	24.3	4.2	29.5	36	. .	. .	. .	750	740	32.3	301 9 24.7	. .	− 1 38.4	352 14 7.5	+ 0.1
29	74 38	29.0	24.0	3.2	0.7	31	670	. .	. .	. .	695	32.3	74 42 42.2	. .	+ 3 35.0	125 52 38.4	+12.7
30	44 4	28.6	23.5	3.9	28.0	36	. .	700	. .	730	. .	32.3	44 7 25.8	. .	+ 57.8	95 14 44.8	+14.0
31	74 54	27.7	23.1	2.5	28.9	38	010	035	. .	. .	. .	32.3	74 57 5.6	31.0	+ 3 38.5	126 7 5.3	+12.5
32	10 20	28.0	25.8	6.0	29.0	37	260	250	. .	280	305	32.3	10 23 16.4	. .	+ 10.9	61 29 48.5	+ 0.3
33	79 48	29.7	25.1	4.5	0.1	37	220	285	. .	. .	. .	32.3	79 51 15.5	. .	+ 5 22.2	131 2 58.9	+12.2
34	74 0	10 0.4	24.6	4.9	1.3	35	860	890	. .	. .	. .	32.3	74 3 36.2	. .	+ 3 26.0	125 13 23.4	+12.2
35	72 8	1.2	25.2	5.5	1.1	35	685	705	. .	. .	. .	32.3	72 11 38.6	. .	+ 3 3.7	123 21 3.5	+12.1
36	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
37	10 22	9 29.8	27.5	7.4	1.4	36	720	. .	740	. .	765	32.3	10 25 22.5	. .	+ 11.0	61 31 54.7	. .
38	16 26	28.3	26.2	6.5	29.7	36	340	365	. .	. .	. .	32.3	16 29 29.6	. .	+ 17.7	67 36 8.5	+ 9.3
39	21 10	29.8	27.3	7.5	0.4	37	. .	140	. .	138	. .	32.3	21 13 16.7	. .	+ 23.2	72 20 1.1	+ 9.4
40	305 28	29.1	26.6	6.2	2.2	36	. .	. .	450	435	425	32.3	305 31 26.8	. .	− 1 23.4	356 36 24.6	+ 0.6
41	77 58	10 1.4	26.0	5.7	1.1	33	985	005	. .	. .	. .	32.3	78 2 4.2	. .	+ 4 34.8	129 13 0.2	+11.2
42	68 48	9 29.2	24.6	5.6	29.7	36	550	560	. .	. .	. .	32.3	68 51 26.4	. .	+ 2 33.1	120 0 20.7	+10.6
43	15 18	29.5	26.5	7.2	0.1	31	. .	360	. .	390	. .	32.3	15 22 45.5	. .	+ 16.4	66 29 23.1	+ 6.5
44	79 6	10 1.6	27.4	5.3	1.1	33	. .	710	. .	705	. .	32.3	79 10 8.8	. .	+ 5 24.5	130 21 54.5	+10.8
45	74 54	9 27.6	22.4	1.3	28.0	33	805	770	. .	. .	. .	32.3	74 58 11.2	. .	+ 3 38.9	126 8 11.3	+10.5
46	71 0	10 1.1	26.0	5.8	1.4	31	. .	580	. .	610	. .	32.3	71 4 41.5	. .	+ 2 52.4	122 13 55.1	+10.1
47	76 48	1.9	27.2	5.9	1.1	34	600	565	. .	. .	. .	32.3	76 51 54.8	. .	+ 4 10.7	128 2 26.7	+10.4
48	78 58	3.6	28.0	6.9	2.1	32	. .	. .	. .	560	635	32.3	79 2 24.7	. .	+ 4 59.3	130 13 45.2	+10.5
49	76 32	0.1	26.0	5.1	29.8	30	. .	475	. .	. .	. .	32.3	76 36 59.2	. .	+ 4 5.8	127 47 26.2	+10.1
50	71 8	2.1	26.1	6.2	1.0	32	150	130	. .	. .	. .	32.3	71 12 36.4	. .	+ 2 53.7	122 21 51.3	+ 9.6

No.	Barom.	At. Ther.
	in.	°
5	30.45	28.5
9	30.45	28.0
12	30.05	34.0
22	30.005	34.0
23	29.56	33.8
31	29.51	33.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
15	− 0.1	. . .	. .	− 0.1
17	−17 29.4	− 16 40.9	. .	− 34 10.3
37	−10 54.5	+ 16 46.3	. .	+ 5 51.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Dec. 12	1	B. A. C. 2285 .	P.	6.0	8.6	10.3	16.5	18.7	20.8	27.0	28.8	31.4	53 18.68	— 0.66	. .	— 8.70	6 53 9.52	— 4.51
	2	B. A. C. 2309 . .	P.	44.3	47.2	48.9	55.6	58.0	0.4	7.4	9.2	12.0	56 58.11	— 1.48	. .	— 8.70	6 56 47.93	— 3.53
	3	B. A. C. 2322 . .	P.	49.7	52.3	53.8	0.1	2.1	4.2	10.3	11.9	14.4	59 2.09	— 0.79	. .	— 8.70	6 58 52.60	— 4.30
	4	B. A. C. 2340 . .	P.	10.7	13.7	15.5	22.7	24.9	27.4	34.4	36.2	39.0	3 24.94	— 0.37	. .	— 8.70	7 3 15.87	— 5.03
	5	B. A. C. 2355 . .	P.	37.2	40.5	42.4	50.3	53.0	55.7	3.5	5.6	8.9	4 53.01	— 1.78	. .	— 8.70	7 4 42.53	— 3.32
	6	B. A. C. 2398 . .	P.	55.6	58.2	59.9	6.1	8.3	10.5	16.8	18.4	21.0	10 8.31	— 0.65	. .	— 8.70	7 9 58.96	— 4.49
	7	B. A. C. 2422 . .	P.	53.4	55.3	0.4	2.8	5.4	7.9	10.5	15.5	17.5	14 5.41	— 1.70	. .	— 8.70	7 13 55.01	— 3.33
	8	B. A. C. 2425 . .	P.	. .	20.2	22.6	25.1	27.7	30.3	35.4	37.3	40.4	14 25.20	— 1.70	. .	— 8.70	7 14 14.80	— 3.33
	9	B. A. C. 2434 . .	P.	. .	6.9	9.0	11.3	13.5	15.8	20.3	21.9	24.8	16 11.34	— 0.53	. .	— 8.70	7 16 2.11	— 4.70
	10	B. A. C. 2469 . .	P.	2.2	5.2	6.9	13.8	16.2	18.3	25.4	27.1	30.0	22 16.12	— 0.42	. .	— 8.70	7 22 7.00	— 4.88
	11	B. A. C. 2477¹ . .	P.	. .	. .	11.9	14.3	16.6	19.2	. .	. .	. .	24 16.70	— 1.57	. .	— 8.70	7 24 6.43	— 3.37
	12	B. A. C. 2477² . .	P.	. .	. .	. .	. .	. .	22.0	27.0	28.7	31.7	24 17.32	— 1.57	. .	— 8.70	7 24 7.05	— 3.37
	13	B. A. C. 2506 . .	P.	40.7	43.7	45.4	52.0	54.3	56.5	3.3	4.9	7.8	30 54.29	— 0.50	. .	— 8.71	7 30 45.08	— 4.71
	14	B. A. C. 2543 . .	P.	1.5	4.3	6.4	14.1	16.8	19.3	27.3	29.0	32.4	35 16.79	— 1.74	. .	— 8.71	7 35 6.34	— 3.22
	15	B. A. C. 2546 . .	P.	. .	. .	. .	37.0	39.6	42.2	47.3	49.0	52.3	35 36.91	— 1.74	. .	— 8.71	7 35 26.46	— 3.22
	16	λ Ursæ Minoris, S.P.	P.	8.0	54.0	32.0	50.0	2.0	. .	21.0	. .	. .	48 10.96	—53.17	. .	— 8.71	19 47 9.08	+ 0.44
	17	B. A. C. 2659 . .	P.	38.3	40.8	42.6	49.0	51.2	53.3	59.7	1.3	3.9	53 51.12	— 0.64	. .	— 8.71	7 53 41.77	— 4.38
	18	Lalande 15898 .	P.	. .	. .	. .	23.4	25.6	27.9	32.5	34.2	37.0	2 23.37	— 0.47	. .	— 8.71	8 2 14.19	— 4.64
	19	B. A. C. 2730 . .	P.	55.4	58.3	0.1	6.9	9.2	11.4	18.0	19.8	22.8	3 9.10	— 0.47	. .	— 8.71	8 2 59.92	— 4.64
	20	B. A. C. 2805 . .	P.	36.2	39.2	41.0	48.7	51.3	54.0	1.4	3.4	6.4	16 51.29	— 1.69	. .	— 8.72	8 16 40.92	— 3.08
	21	B. A. C. 2901 . .	P.	. .	6.0	7.7	. .	. .	. .	. .	. .	. .	31 15.84	— 0.85	. .	— 8.72	8 31 6.27	— 3.90
	22	B. A. C. 2984 . .	P.	45.6	48.3	50.6	57.3	59.8	2.1	9.7	11.4	14.3	42 59.77	— 0.29	. .	— 8.72	8 42 50.76	— 4.75
	23	B. A. C. 3013 . .	P.	49.0	51.6	53.1	59.4	1.5	3.6	9.5	11.2	13.8	46 1.41	— 0.85	. .	— 8.72	8 45 51.84	— 3.83
	24	B. A. C. 3105 . .	P.	24.5	27.2	28.8	34.7	36.7	38.8	45.2	46.7	49.2	59 36.87	— 0.86	. .	— 8.73	8 59 27.28	— 3.76
	25	B. A. C. 3112 . .	P.	. .	19.0	21.5	24.0	26.6	29.1	34.0	36.0	39.0	1 24.08	— 0.27	. .	— 8.73	9 1 15.08	— 4.66
	26	B. A. C. 3122 . .	P.	2.0	3.7	8.0	10.0	12.0	14.0	16.1	20.3	21.9	3 12.00	— 0.74	. .	— 8.73	9 3 2.53	— 3.90
	27	B. A. C. 3178 . .	P.	24.6	27.8	29.6	. .	. .	. .	. .	. .	. .	13 39.60	— 0.26	. .	— 8.73	9 13 30.61	— 4.59
	28	α Hydræ	P.	27.6	30.1	31.8	37.8	39.8	41.9	48.1	49.8	52.4	21 39.92	— 1.10	— 8.79	— 8.72	9 21 30.10	+ 0.04
	29	B. A. C. 3250 . .	P.	13.1	15.8	17.5	23.6	25.7	27.6	33.8	35.6	38.0	25 25.63	— 0.74	. .	— 8.73	9 25 16.16	— 3.77
	30	α Leonis	P.	43.3	45.8	47.4	53.7	55.6	58.6	4.3	5.9	8.4	1 55.86	— 0.73	— 8.77	— 8.73	10 1 46.40	0.00
	31	B. A. C. 3511 . .	P.	21.4	24.4	25.6	30.5	32.6	34.8	36.9	39.3	. .	10 34.84	— 0.52	. .	— 8.74	10 10 25.58	— 3.77
	32	γ¹ Leonis	P.	. .	. .	. .	. .	. .	22.0	26.4	. .	30.7	13 17.63	— 0.58	— 8.67	— 8.73	10 13 8.32	— 0.08
	33	B. A. C. 3532 . .	P.	35.3	38.0	39.6	43.5	45.6	47.6	49.6	. .	. .	14 47.64	— 0.90	. .	— 8.74	10 14 38.00	— 3.31
	34	B. A. C. 3622¹. .	P.	. .	31.5	33.2	37.3	39.3	41.3	43.3	. .	. .	28 41.36	— 0.79	. .	— 8.74	10 28 31.83	— 3.33
	35	B. A. C. 3684 . .	P.	43.5	46.0	47.6	53.7	55.8	7.6	3.9	5.5	8.0	38 55.77	— 0.90	. .	— 8.74	10 38 46.13	— 3.15
	36	ε Bootis	E.	28.6	31.6	33.2	40.1	42.5	44.8	51.7	53.4	56.4	39 42.48	— 0.41	— 8.88	— 8.93	14 39 33.14	— 0.07
	37	α² Libræ	E.	57.3	59.9	1.7	7.9	10.0	12.0	18.4	20.0	22.6	44 9.98	— 1.24	— 8.97	— 8.93	14 43 59.81	+ 0.03
	38	β Ursæ Minoris . .	E.	. .	. .	. .	. .	16.7	24.2	30.0	45.6	55.3	51 8.92	+ 2.84	. .	— 8.93	14 51 2.83	+ 0.11
	39	β Bootis	E.	. .	. .	19.6	21.9	24.6	27.1	29.9	. .	. .	57 24.50	— 0.06	. .	— 8.93	14 57 15.51	+ 0.26
	40	β Libræ	E.	16.4	18.9	20.6	26.7	28.8	30.9	37.6	38.6	41.3	10 28.80	— 1.12	— 8.99	— 8.93	15 10 18.75	+ 0.06
	41	μ Bootis	E.	40.6	43.8	45.9	. .	. .	. .	. .	. .	11.9	19 56.21	— 0.15	— 9.01	— 8.93	15 19 47.13	+ 0.07
	42	α Coronæ Borealis .	E.	20.5	23.4	25.0	32.0	34.2	36.6	3.5	45.0	48.0	29 34.24	— 0.42	— 8.89	— 8.93	15 29 24.89	— 0.04
	43	α Serpentis . . .	E.	5.7	8.3	9.8	16.0	18.0	20.0	26.2	27.8	30.4	38 18.02	— 0.83	— 8.95	— 8.94	15 38 8.25	+ 0.03
	44	Mercury II, C. .	E.	. .	. .	35.9	38.2	40.5	42.6	44.7	. .	. .	51 40.38	— 1.39	. .	— 8.97	16 51 30.02	— 0.17
13	45	Sun I	E.	2.6	5.4	7.0	13.6	16.0	18.2	24.7	26.4	29.4	21 15.92	— 1.40	. .	— 8.97	17 21 5.55	. .
	46	Sun II	E.	. .	. .	. .	. .	40.2	42.6	47.0	48.6	51.4	23 38.05	— 1.40	. .	— 8.97	17 23 27.68	. .
	47	β Lyræ	E.	22.9	. .	. .	. .	. .	. .	. .	. .	52.1	45 37.50	— 0.28	— 8.89	— 8.95	18 45 28.27	— 0.03
	48	Venus I, S. . .	E.	17.9	20.5	22.4	29.0	31.2	33.4	40.3	41.9	44.8	51 31.27	— 1.42	. .	— 8.98	18 51 20.87	+ 0.40
	49	Venus, N. . . .	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . . .	. .
	50	γ Aquilæ	E.	17.8	20.3	21.8	28.0	30.2	32.3	38.4	40.0	42.7	40 30.17	— 0.77	— 8.96	— 8.96	19 40 20.44	+ 0.03

2, 15, 18. Wire B used.
4, 5, 29. Bisections at sets B and D.
16. Bisections at wires B_1, B_2, and B_3.
38. Bisections at wires V and VI.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ′	″
1	22 34	9 27.9	25.0	6.0	28.8	33	605	600	. .	. .	. .	32.3	22 38 12.4	. .	+ 24.9	73 44 58.5	+ 3.2
2	66 34	10 0.1	25.0	5.2	29.4	29	800	760	. .	. .	. .	32.3	66 36 37.0	. .	+ 2 17.1	117 45 15.3	+ 8.6
3	29 26	0.6	26.9	7.1	1.5	31	720	745	. .	. .	. .	32.3	29 30 38.9	. .	+ 33.8	80 37 33.9	+ 3.6
4	8 22	9 29.0	26.5	7.0	0.5	31	860	. .	. .	. .	895	32.3	8 26 37.7	. .	+ 8.9	59 33 7.8	+ 0.1
5	78 12	10 1.4	26.4	5.7	1.4	33	470	. .	. .	. .	540	32.3	78 16 12.2	. .	+ 4 40.3	129 27 13.7	+ 9.5
6	22 4	9 29.0	27.7	6.0	29.4	36	745	715	. .	. .	. .	32.3	22 7 23.5	. .	+ 24.3	73 14 9.0	+ 1.3
7	75 16	29.4	24.0	3.9	28.6	33	665	620	. .	. .	. .	32.3	75 20 11.7	. .	+ 3 44.4	126 30 17.3	+ 8.8
8	75 16	29.4	24.0	3.9	28.6	31	725	740	. .	. .	. .	32.3	75 20 41.0	. .	+ 3 44.5	126 30 46.7	+ 8.8
9	15 38	10 0.3	26.9	8.5	1.2	33	. .	. .	. .	020	990	32.3	15 42 20.0	. .	+ 16.8	66 48 58.0	− 0.4
10	10 40	9 29.2	26.0	6.9	29.6	37	650	665	. .	. .	. .	32.3	10 43 9.5	. .	+ 11.3	61 49 42.0	− 1.9
11	70 22	10 0.2	24.6	4.0	29.2	33	. .	. .	. .	455	450	32.3	70 26 14.8	. .	+ 2 46.4	121 35 22.4	+ 7.8
12	70 22	0.2	24.6	4.0	29.2	33	. .	. .	. .	890	845	32.3	70 26 8.5	. .	+ 2 46.4	121 35 16.1	+ 7.8
13	14 12	0.1	27.0	7.9	1.4	37	735	790	. .	. .	. .	32.3	14 15 6.7	. .	+ 15.2	65 21 43.1	− 2.4
14	76 46	1.6	26.2	5.4	1.0	31	. .	. .	. .	635	585	32.3	76 50 41.4	. .	+ 4 10.1	128 1 12.7	+ 8.1
15	76 46	1.6	26.2	5.4	1.0	33	. .	. .	. .	145	100	32.3	76 47 45.5	. .	+ 4 9.2	127 58 15.9	+ 8.1
16	307 46	9 28.1	25.2	5.3	1.6	30	180	265	320	. .	. .	32.3	307 51 0.1	. .	− 1 16.7	358 56 4.6	+ 1.1
17	21 10	10 0.4	27.0	7.2	0.6	32	870	895	. .	. .	. .	32.3	21 14 21.6	. .	+ 23.2	72 21 6.0	− 3.7
18	12 56	2.2	27.2	8.6	3.1	31	. .	. .	. .	470	490	32.3	12 58 9.6	29.8	+ 13.8	64 4 44.6	− 6.4
19	12 56	2.2	37.2	8.6	3.1	32	. .	. .	. .	495	530	32.3	13 0 26.5	. .	+ 13.8	64 7 1.5	− 6.5
20	74 52	1.2	26.0	5.5	1.5	37	. .	595	. .	610	. .	32.3	74 55 9.5	. .	+ 3 38.1	126 5 8.8	+ 5.9
21	32 40	9 29.0	25.0	5.5	29.9	31	. .	225	. .	. .	. .	32.3	32 44 48.9	. .	+ 38.4	83 51 48.5	− 4.8
22	5 4	27.4	25.5	6.1	0.4	31	585	555	. .	. .	. .	32.3	5 8 43.3	. .	+ 5.4	56 15 9.9	−13.0
23	33 0	29.6	26.5	6.4	0.3	32	075	105	. .	. .	. .	32.3	33 4 34.2	. .	+ 38.9	84 11 34.3	− 6.0
24	33 14	28.8	24.5	6.0	29.3	35	700	640	. .	. .	. .	32.3	33 17 40.4	. .	+ 39.2	84 24 40.8	− 7.2
25	4 26	29.1	26.8	7.6	0.4	32	. .	. .	. .	450	430	32.3	4 30 29.6	. .	+ 4.5	55 36 55.3	−15.2
26	26 44	28.0	25.4	6.7	0.3	30	. .	. .	. .	725	690	32.3	26 48 56.7	. .	+ 30.2	77 55 48.1	− 9.4
27	3 54	28.0	26.0	5.9	29.1	31	. .	805	. .	. .	. .	32.3	3 58 39.8	. .	+ 4.1	55 5 5.1	−16.7
28	46 56	10 1.3	26.5	6.1	1.5	35	315	335	. .	355	330	32.3	46 59 44.1	. .	+ 1 4.0	98 7 9.3	+ 1.0
29	26 58	0.7	26.7	7.5	0.8	33	480	. .	. .	. .	505	32.3	27 2 12.3	29.2	+ 30.5	78 9 4.0	−11.3
30	26 14	9 29.7	26.0	5.9	0.2	31	. .	. .	. .	440	410	32.3	26 18 45.4	. .	+ 29.5	77 25 36.1	+ 0.9
31	15 6	10 0.8	27.5	7.0	1.6	35	. .	. .	. .	325	330	32.3	15 9 44.5	. .	+ 16.2	66 16 21.9	−19.0
32	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
33	35 54	9 27.8	23.3	4.3	28.3	34	. .	. .	. .	. .	320	32.3	35 58 3.1	. .	+ 43.3	87 5 7.6	−12.7
34	29 32	10 1.1	27.2	7.8	1.8	35	. .	805	. .	810	. .	32.3	29 35 36.3	. .	+ 33.9	80 42 31.4	−15.5
35	35 40	9 28.5	23.1	2.8	28.5	32	. .	600	. .	620	. .	32.3	35 44 29.0	29.3	+ 42.9	86 51 33.1	−14.1
36	11 14	29.5	28.8	7.7	1.4	35	. .	295	. .	290	. .	32.9	11 17 45.1	. .	+ 11.5	62 24 17.8	+ 1.7
37	54 20	10 5.7	1.9	14.3	6.0	34	. .	550	. .	650	. .	32.9	54 23 52.3	. .	+ 1 21.6	105 31 35.1	+ 5.9
38	324 10	5.0	4.0	13.0	6.4	30	. .	. .	350	410	. .	32.9	324 14 55.9	39.5	− 42.1	15 20 35.0	+ 0.9
39	357 56	1.8	28.8	10.0	2.5	29	. .	915	. .	955	. .	32.9	358 1 5.8	. .	− 2.0	49 7 25.0	+ 3.2
40	47 44	9 27.5	25.1	5.2	28.4	34	. .	200	. .	115	. .	32.9	47 48 5.0	. .	+ 1 4.5	98 55 30 7	+ 3.5
41	1 0	10 10.2	7.7	19.5	10.5	29	. .	. .	. .	550	480	32.9	1 5 4.0	. .	+ 1.1	52 11 26.3	+ 2.7
42	11 42	3.3	29.7	11.3	4.3	35	. .	620	. .	650	. .	32.9	11 45 37.0	. .	+ 12.2	62 52 10.4	+ 1.5
43	32 0	4.8	2.2	11.7	5.3	33	. .	550	. .	540	. . .	32.9	32 4 7.6	. .	+ 36.6	83 11 5.4	+ 2.0
44	61 48	9 27.0	25.0	8.8	2.2	31	. .	260	. .	. .	425	32.9	61 52 46.0	41.5	+ 1 48.6	113 0 55.8	. .
45	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
46	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	42.0	. .	. . . .	. .
47	5 36	10 0.9	0.0	8.9	2.8	32	. .	300	. .	420	. .	32.9	5 40 28.7	. .	+ 5.8	56 46 55.7	+ 3.3
48	63 0	5.0	1.3	10.8	5.1	30	. .	070	. .	205	. .	32.9	63 5 0.0	. .	+ 1 54.7	114 13 15.9	. .
49	63 0	5.0	1.3	10.8	5.1	30	870	. .	. .	. .	985	32.9	63 4 47.7	. .	+ 1 54.7	114 13 3.6	. .
50	28 30	0.9	29.6	9.0	4.0	32	. .	. .	. .	170	140	32.9	28 34 31.8	. .	+ 31.9	79 41 24.9	+ 5.2

No.	Barom.	At. Ther.
	in.	°
18	29.46	32.3
29	29.44	32.6
35	29.43	33.0
38	29.49	37.5
44	29.48	41.0
46	29.49	41.5

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
44	− 5.5	0.0	. .	− 5.5
48	− 5.1	− 6.2	. .	− 11.3
49	− 5.1	+ 6.1	0.0	+ 1.0

For summary of the elements of reduction see page 3.

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
													m. s.	s.	s.	s.	h. m. s.	s.
1875. Dec. 13	1	ζ Cygni	E.	33.4	36.4	38.1	45.2	47.6	50.0	57.0	58.7	1.6	7 47.56	− 0.36	− 9.02	− 8.96	21 7 38.24	+ 0.07
	2	α Cephei	E.	16.4	21.8	25.0	38.2	42.5	47.0	0.1	3.3	8.9	15 42.58	+ 1.01	. .	− 8.96	21 15 34.63	+ 0.01
	3	β Aquarii	E.	58.7	1.2	2.8	8.9	11.0	13.0	19.3	20.8	23.4	25 11.01	− 1.07	− 9.02	− 8.97	21 25 0.97	+ 0.08
	4	β Arietis	E.	44.4	47.1	48.8	55.2	57.5	59.6	6.0	7.7	10.4	47 57.41	− 0.59	− 8.89	− 8.99	1 47 47.83	− 0.08
	5	50 Cassiopeæ	E.	21.0	29.1	34.0	53.8	0.4	6.8	26.0	31.1	40.6	53 0.31	+ 2.15	. .	− 8.99	1 52 53.47	0.00
	6	α Arietis	E.	. .	. .	16.7	18.9	21.0	23.3	25.5	. .	. .	0 21.08	− 0.54	− 8.96	− 8.99	2 0 11.55	− 0.02
	7	ξ¹ Ceti	E.	23.7	26.3	27.9	34.0	36.0	38.2	44.4	45.9	48.4	6 36.09	− 0.82	− 9.02	− 8.99	2 6 26.28	+ 0.07
	8	ι Cassiopeæ	E.	29.6	36.0	39.8	55.5	0.7	5.9	21.5	25.4	32.0	19 0.71	+ 1.43	. .	− 8.99	2 18 53.15	+ 0.12
	9	5 Ursæ Minoris, S. P.	E.	. .	. .	17.8	9.5	0.6	51.9	13.5	. .	. .	28 0.66	− 5.14	. .	− 8.99	14 27 46.53	+ 0.10
	10	Lalande 4803	E.	15.0	17.7	19.2	25.4	27.4	29.4	35.6	37.1	39.7	29 27.39	− 0.80	. .	− 8.96	2 29 17.57	− 3.82
	11	γ¹ Ceti	E.	51.0	53.4	55.0	1.2	3.3	5.3	11.4	13.0	15.5	37 3.23	− 0.92	− 9.00	− 8.99	2 36 53.32	+ 0.01
	12	B. A. C. 873	E.	28.8	32.0	33.9	41.5	44.0	46.6	54.2	56.0	59.3	42 44.03	− 1.74	. .	− 8.96	2 42 33.33	− 3.81
	13	B. A. C. 878¹	E.	37.6	40.8	42.6	. .	. .	. .	3.4	5.4	8.7	43 53.08	− 1.79	. .	− 8.96	2 43 43.33	− 3.82
	14	B. A. C. 910	E.	20.9	23.5	25.0	31.3	33.3	35.3	41.5	43.0	45.7	50 33.28	− 1.15	. .	− 8.96	2 50 23.17	− 3.81
	15	α Ceti	E.	46.3	48.9	50.4	56.5	58.6	0.6	6.7	8.3	10.8	55 58.57	− 0.91	− 8.95	− 8.99	2 55 48.67	− 0.02
	16	48 Cephei	E.	52.0	3.8	10.4	38.0	47.5	56.9	24.7	31.7	43.4	4 47.60	+ 3.58	. .	− 8.99	3 4 42.19	+ 0.24
	17	B. A. C. 1005	E.	25.4	28.4	30.2	37.3	39.5	41.9	49.0	50.8	53.8	8 39.59	− 1.58	. .	− 8.96	3 8 29.05	− 3.81
	18	B. A. C. 1037	E.	58.5	1.1	2.8	9.5	11.7	14.0	20.4	22.2	24.9	14 11.68	− 1.40	. .	− 8.96	3 14 1.32	− 3.82
	19	η Tauri	E.	. .	. .	12.9	15.0	17.2	19.5	21.6	. .	. .	40 17.24	− 0.52	− 8.91	− 9.00	3 40 7.72	− 0.09
	20	ζ Persei	E.	16.5	19.4	21.0	28.9	30.6	33.0	40.3	42.0	45.0	46 30.74	− 0.34	− 9.06	− 9.00	3 46 21.40	+ 0.05
	21	ε Ursæ Minoris, S. P.	E.	24.0	. .	. .	8.0	52.5	37.5	53.0	42.0	23.0	58 53.15	− 8.48	. .	− 9.00	16 58 35.67	− 0.49
	22	α Orionis	E.	26.0	28.7	30.2	36.3	38.4	40.5	46.6	48.2	50.6	48 38.39	− 0.84	− 8.93	− 9.01	5 48 28.54	− 0.11
	23	B. A. C. 1900	E.	11.0	14.2	16.1	23.9	26.5	29.0	36.7	38.5	41.7	51 26.40	− 0.19	. .	− 8.96	5 51 17.25	− 5.44
	24	δ Ursæ Minoris, S. P.	E.	. .	. .	34.5	0.5	25.5	. .	. .	. .	. .	12 25.52	−18.17	. .	− 9.01	18 11 58.34	+ 0.03
	25	B. A. C. 2063	E.	57.1	0.0	1.7	8.3	10.5	12.7	19.4	21.1	24.0	18 10.53	− 0.52	. .	− 8.96	6 18 1.05	− 4.83
	26	γ Geminorum	E.	30.8	33.5	35.1	41.4	43.6	45.7	52.2	53.8	56.5	30 43.62	− 0.67	− 8.94	− 9.01	6 30 33.94	− 0.10
	27	B. A. C. 2191	E.	15.3	18.0	19.8	26.5	28.7	31.0	37.8	39.5	42.3	36 28.77	− 0.49	. .	− 8.96	6 36 19.32	− 4.88
	28	α Canis Majoris	E.	39.6	42.3	43.9	50.3	52.4	54.5	0.9	2.5	5.3	39 52.41	− 1.28	− 9.17	− 9.01	6 39 42.12	+ 0.08
	29	51 Cephei	E.	. .	. .	. .	. .	0.5	42.5	25.0	30.0	15.0	42 0.39	+20.18	. .	− 9.01	6 42 11.56	− 0.32
	30	ε Canis Majoris	E.	43.0	46.0	47.7	54.5	56.9	59.3	6.1	8.0	10.9	53 56.93	− 1.55	− 9.01	− 9.01	6 53 46.37	− 0.05
	31	Moon II, N.	E.	19.4	22.3	24.2	28.9	. .	38.5	43.0	44.8	47.9	58 33.62	− 0.43	. .	− 8.96	6 58 24.23	−79.08
15	32	γ² Ursæ Minoris	P.	. .	29.6	34.8	54.8	1.4	7.7	28.2	33.3	. .	21 1.40	+ 2.52	. .	− 9.93	15 20 53.99	+ 0.17
	33	α Coronæ Borealis	P.	21.5	24.4	26.0	33.0	35.3	37.6	44.5	46.2	49.0	29 35.28	− 0.42	− 9.87	− 9.93	15 29 24.93	− 0.06
	34	ε Serpentis	P.	35.3	38.0	39.6	45.7	47.7	49.7	55.8	7.3	59.9	44 47.67	− 0.91	− 9.96	− 9.94	15 44 36.82	+ 0.05
	35	ζ Ursæ Minoris	P.	. .	. .	. .	. .	43.3	53.0	13.2	20.0	33.0	48 32.90	+ 4.41	. .	− 9.94	15 48 27.37	− 0.03
	36	δ Scorpii	P.	56.0	. .	. .	5.0	7.7	9.7	. .	. .	. .	53 9.88	− 1.49	− 9.87	− 9.94	15 52 58.45	− 0.06
	37	α Scorpii	P.	44.7	47.5	48.9	55.9	58.2	0.4	7.6	8.6	11.8	21 58.18	− 1.58	−10.00	− 9.94	16 21 46.66	+ 0.05
	38	η Herculis	P.	31.3	34.6	33.6	44.4	47.1	49.7	57.6	59.6	2.6	38 47.09	− 0.08	− 9.96	− 9 94	16 38 37.07	+ 0.03
	39	Mercury II, C.	P.	39.6	42.4	50.8	53.0	55.0	57.6	2.0	3.8	6.5	11 53.03	− 1.53	. .	−10.02	17 11 41.48	− 0.17
16	40	Sun I, N.	P.	20.1	22.0	24.7	31.3	33.6	35.8	42.3	44.6	46.8	34 33.47	− 1.51	. .	−10.04	17 34 21.92	. .
	41	Sun II, S.	P.	42.4	45.3	46.7	53.2	55.5	57.7	4.3	6.0	9.0	36 55.57	− 1.51	. .	−10.04	17 36 44.02	. .
17	42	ε Piscium	E.	29.5	32.2	33.6	39.9	41.9	43.9	50.0	51.6	54.2	56 41.87	− 0.83	−10.33	−10.42	0 56 30.63	− 0.08
	43	B. A. C. 334	E.	43.3	46.3	48.2	55.6	58.2	0.6	8.1	10.0	12.2	2 58.06	− 0.24	. .	−10.40	1 2 47.42	− 3.28
	44	Polaris	E.	. .	. .	54.0	21.5	49.5	14.5	42.5	. .	. .	12 48.40	+40.21	. .	−10.45	1 13 18.16	− 0.39
	45	θ¹ Ceti	E.	49.2	51.9	53.4	59.6	1.7	2.7	9.9	11.4	14.0	18 1.53	− 1.11	−10.43	−10.45	1 17 49.97	0.00
	46	38 Cassiopeæ	E.	35.2	42.4	47.0	4.7	10.5	16.3	33.9	38.3	45.8	22 10.46	+ 1.72	. .	−10.45	1 22 1.63	− 0.03
	47	B. A. C. 569	E.	58.0	1.0	2.8	9.8	12.0	14.4	21.5	23.3	26.0	46 12.09	− 0.38	. .	−10.42	1 46 1.29	− 3.68
	48	β Arietis	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	49	Neptune	E.	46.0	48.7	50.4	56.4	58.5	0.7	6.8	8.5	11.0	55 58.56	− 0.77	. .	−10.44	1 55 47.35	. .
	50	α Arietis	E.	9.2	12.0	13.7	20.4	22.6	24.8	31.5	33.2	35.8	0 22.58	− 0.52	−10.50	−10.47	2 0 11.59	+ 0.04

6. Bisections at wires V and VI.
16, 21, 32, 46. Bisections at sets B and D.
31, 39. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	9 6	9 28.5	25.3	6.7	0.9	33	. .	120	. .	145	. .	32.9	9 10 19.7	. .	+ 9.5	60 16 50.4	+ 2.2
2	336 46	10 0.0	27.3	7.0	2.7	33	125	100	. .	085	140	32.9	336 50 19.4	. .	− 25.2	27 56 15.4	+ 0.8
3	44 56	4.2	29.5	9.8	2.4	35	. .	005	. .	975	. .	32.9	44 59 47.4	38.5	+ 58.9	96 7 7.5	+ 5.1
4	18 38	0.0	28.3	10.0	3.0	37	. .	670	. .	750	. .	32.8	18 41 57.2	. .	+ 20.1	69 47 48.5	+ 2.6
5	327 2	4.5	1.2	11.3	6.0	38	. .	740	. .	770	. .	32.8	327 4 48.9	. .	− 38.5	18 10 31.6	+ 0.8
6	15 58	3.5	0.6	11.8	3.9	39	. .	. .	. .	190	210	32.8	16 0 42.2	34.5	+ 17.1	67 7 20.5	+ 2.0
7	30 34	3.0	29.0	10.2	4.0	37	. .	510	. .	600	. .	32.8	30 37 8.0	. .	+ 35.2	81 44 4.4	+ 1.7
8	332 0	3.3	29.5	9.8	4.2	36	. .	840	. .	860	. .	32.8	332 3 19.4	. .	− 31.5	23 9 9.1	+ 1.6
9	295 6	1.6	27.8	9.2	3.4	32	. .	. .	. .	010	970	32.8	295 10 17.1	. .	− 2 5.9	346 14 32.4	+ 1.0
10	32 32	4.0	0.3	10.5	3.2	36	. .	800	. .	860	. .	32.8	32 35 18.6	. .	+ 38.0	83 42 17.8	+22.6
11	36 6	2.1	27.6	8.9	2.0	33	. .	790	. .	865	. .	32.8	36 10 6.4	. .	+ 43.4	87 17 11.0	+ 1.1
12	74 50	5.4	29.3	9.0	4.2	33	270	365	. .	. .	. .	32.8	74 54 11.7	. .	+ 3 37.0	126 4 9.9	+12.5
13	76 40	5.6	0.0	9.3	4.5	31	. .	. .	. .	015	020	32.8	76 44 47.2	. .	+ 4 7.4	127 55 15.8	+12.1
14	48 12	3.0	29.2	10.7	3.0	33	. .	845	. .	890	. .	32.8	48 16 4.4	. .	+ 1 6.6	99 23 32.2	+18.4
15	35 12	4.2	29.7	10.3	3.5	31	. .	175	. .	230	. .	32.8	35 16 44.9	. .	+ 42.0	86 23 48.1	+ 2.1
16	321 34	4.9	1.0	11.1	6.7	35	430	. .	. .	. .	570	32.8	321 37 37.9	. .	− 47.1	12 43 12.0	+ 1.1
17	69 4	2.8	27.5	7.8	4.2	37	. .	480	. .	570	. .	32.8	69 7 9.2	. .	+ 2 34.7	120 10 5.1	+13.9
18	61 0	8.7	3.8	13.3	8.2	32	. .	000	. .	030	. .	32.8	61 4 28.2	. .	+ 1 47.2	112 12 36.6	+15.4
19	15 6	4.3	0.7	11.3	4.5	34	. .	. .	. .	100	120	32.8	15 10 0.1	. .	+ 16.1	66 16 37.4	+ 0.8
20	7 18	1.7	29.8	10.3	2.5	32	. .	180	. .	200	. .	32.8	7 22 30.8	. .	+ 7.7	58 28 59.7	+ 0.5
21	301 6	3.6	29.6	9.0	3.3	36	405	. .	490	. .	440	32.8	301 9 24.7	. .	− 1 33.1	352 14 7.8	+ 0.8
22	31 26	9 29.5	26.3	7.7	0.7	34	. .	. .	. .	360	410	32.8	31 29 59.9	. .	+ 30.4	82 36 57.5	+ 2.9
23	1 38	10 3.1	0.8	11.3	4.0	36	. .	. .	. .	440	490	32.8	1 41 24.6	34.5	+ 1.8	52 47 47.6	+ 9.0
24	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
25	15 18	2.5	29.8	9.7	2.5	31	. .	150	. .	155	. .	32.8	15 22 46.6	. .	+ 10.4	66 29 24.2	+ 6.5
26	22 18	5.6	2.0	12.8	5.5	30	. .	335	. .	425	. .	32.8	22 22 55.5	. .	+ 24.6	73 29 41.3	+ 2.0
27	13 34	2.5	0.0	10.4	2.3	33	. .	420	. .	430	. .	32.8	13 38 11.6	. .	+ 14.5	64 44 47.3	+ 4.1
28	55 20	10.2	6.2	16.6	9.4	30	. .	020	. .	050	. .	32.8	55 24 56.5	. .	+ 1 26.4	116 32 44.1	+ 3.5
29	311 36	2.0	28.3	9.0	3.7	31	. .	. .	360	410	495	32.8	311 40 42.8	. .	− 1 7.0	2 45 57.0	+ 0.2
30	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
31	11 0	2.8	29.5	10.0	1.5	39	030	980	960	830	810	32.8	11 0 15.0	32.5	+ 11.6	62 6 47.8	. .
32	326 34	9 27.6	25.0	5.8	1.0	34	260	. .	110	. .	085	33.7	326 38 5.4	. .	− 39.2	17 43 47.4	+ 2.3
33	11 42	26.4	23.5	5.1	29.3	36	130	105	. .	970	955	33.7	11 45 37.8	33.2	+ 12.5	62 52 11.5	+ 1.7
34	33 58	10 0.3	25.2	6.5	1.8	34	. .	675	. .	485	. .	33.7	34 1 57.6	. .	+ 40.4	85 8 59.2	+ 2.1
35	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
36	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	36.3	. .	. . . .	. .
37	64 56	9 28.3	23.0	4.8	29.3	30	. .	. .	. .	000	940	33.7	65 0 53.5	38.1	+ 2 7.0	116 9 21.7	+ 1.3
38	359 40	28.5	24.2	7.0	1.0	33	380	330	. .	200	190	33.7	359 44 18.7	39.3	− 0.3	50 50 39.6	+ 3.7
39	62 38	29.8	24.1	6.1	29.8	33	435	375	. .	170	155	33.7	62 39 44.2	39.2	+ 1 54.1	113 48 9.5	. .
40	61 52	10 4.3	28.6	9.2	3.3	34	220	260	. .	. .	. .	33.7	61 56 1.0	. .	+ 1 50.3	113 4 12.5	. .
41	62 24	0.2	25.1	6.5	1.2	32	. .	. .	. .	155	160	33.7	62 28 33.3	41.0	+ 1 52.8	113 36 47.3	. .
42	31 36	0.8	27.2	8.5	0.3	35	. .	835	. .	775	. .	34.5	31 39 38.8	18.5	+ 38.3	82 46 38.3	+ 2.0
43	3 52	5.5	2.5	13.3	5.7	35	. .	670	. .	480	. .	34.5	3 55 37.5	. .	+ 4.3	55 2 3.0	+31.9
44	310 12	6.0	3.0	12.8	6.2	35	290	. .	240	. .	200	34.5	310 15 42.4	. .	− 1 13.4	1 20 50.2	+ 3.5
45	47 38	0.5	27.7	6.3	29.5	34	. .	640	. .	560	. .	34.5	47 41 57.9	. .	+ 1 8.3	98 49 27.4	+ 2.4
46	329 12	1.8	29.4	10.7	4.0	32	530	. .	. .	. .	490	34.5	329 16 27.2	. .	− 37.0	20 22 11.4	+ 2.4
47	9 50	6.4	3.5	13.8	6.3	30	. .	490	. .	370	. .	34.5	9 54 55.5	. .	+ 10.9	61 1 27.6	+29.6
48	18 38	7.2	4.5	15.4	6.7	37	. .	680	. .	540	. .	34.5	18 41 4.5	. .	+ 21.1	69 47 46.8	+ 0.9
49	28 52	4.8	0.5	11.0	4.8	32	. .	410	. .	250	. .	34.5	28 56 28.5	. .	+ 34.4	80 3 24.1	. .
50	15 58	0.0	28.2	9.0	1.7	39	. .	. .	. .	450	440	34.5	16 0 41.5	. .	+ 17.9	67 7 20.6	+ 2.1

No.	Barom.	At. Ther.
	in.	°
3	29.56	40.0
6	29.63	36.0
23	29.66	35.5
33	29.87	33.5
36	29.86	36.3
37	29.86	37.7
38	29.85	38.5
39	29.82	38.3
41	29.81	39.2
42	29.96	21.5

For summary of the elements of reduction see page 3.

No	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
31	−11 26.9	+ 16 40.1	. .	+ 5 13.2
39	− 5.5	0.0	. .	− 5.5
40	− 8.0	+ 16 17.4	. .	+ 16 9.4
41	− 8.0	− 16 17.4	. .	− 16 25.4
49	− 0.1	. . .	. .	− 0.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Dec. 17	1	Lalande 4803 . .	E.	16.6	19.3	20.8	26.8	28.9	30.9	37.0	38.7	41.2	29 28.91	− 0.84	. .	−10.47	2 29 17.60	− 3.80
	2	γ Ceti	D.	52.4	54.7	56.4	2.4	4.4	6.4	12.5	14.3	16.6	37 4.46	− 0.90	−10.26	. .	. . . .	. .
	3	B. A. C. 872 . .	E.	39.1	42.0	43.7	50.5	52.9	55.1	2.0	3.7	6.6	42 52.84	− 0.43	. .	−10.48	2 42 41.93	− 4.13
	4	α Ceti.	E.	47.8	50.3	51.9	58.0	0.1	2.1	8.4	9.8	12.4	56 0.09	− 0.88	−10.50	−10.48	2 55 48.73	+ 0.04
	5	ζ Arietis	D.	48.0	49.6	53.8	56.0	58.2	0.3	2.3	7.0	8.6	7 58.20	− 0.56	−10.34	. .	. . . .	. .
	6	δ Persei	E.	59.4	3.1	5.4	14.5	17.5	20.5	29.6	31.8	35.7	34 17.50	+ 0.15	. .	−10.50	3 34 7.15	+ 0.09
	7	η Tauri	E.	8.1	9.9	14.3	16.6	18.8	21.1	23.3	27.6	29.4	40 18.79	− 0.50	−10.47	−10.50	3 40 7.79	− 0.03
	8	ζ Persei	E.	17.9	20.8	22.7	29.9	32.2	34.6	41.8	43.6	46.6	46 32.23	− 0.32	−10.56	−10.50	3 46 21.41	+ 0.05
	9	γ^1 Eridani. . . .	E.	14.9	17.5	19.1	25.4	27.5	29.5	35.9	37.5	40.2	52 27.50	− 1.21	−10.46	−10.50	3 52 15.79	0.00
	10	γ Tauri	D.	43.6	46.3	47.9	54.2	56.3	58.4	4.5	6.4	9.2	12 56.31	− 0.66	−10.35	. .	. . . .	. .
	11	Lutetia	E.	54.7	57.5	59.3	3.5	5.8	8.0	10.3	12.4	. .	23 7.96	− 0.55	. .	−10.56	4 22 56.85	. .
	12	Freia	E.	57.4	0.6	2.4	8.8	11.0	13.3	19.5	21.1	23.8	24 10.88	− 0.58	. .	−10.56	4 23 59.74	. .
	13	α Tauri	D.	47.7	50.3	52.0	58.3	0.6	2.4	9.0	10.6	13.3	29 0.47	− 0.65	−10.38	. .	. . . .	. .
	14	ι Aurigæ. . . .	E.	52.7	55.7	57.6	4.8	7.3	9.7	17.0	18.9	21.9	49 7.29	− 0.29	−10.63	−10.52	4 48 56.48	+ 0.07
	15	γ^2 Ursæ Minoris . .	F.	. .	. .	49.3	55.9	2.6	9.1	16.2	. .	. .	21 2.62	+ 1.98	. .	−10.85	15 20 53.75	− 0.15
	16	α Coronæ Borealis .	F.	22.4	25.2	27.0	33.9	36.2	38.6	45.5	47.1	50.0	29 36.21	− 0.40	−10.77	−10.85	15 29 24.96	− 0.08
	17	α Serpentis . . .	F.	10.3	11.9	16.0	18.0	20.0	22.0	24.1	28.2	29.9	38 20.04	− 0.78	−10.91	−10.86	15 38 8.40	+ 0.07
	18	ζ Ophiuchi . . .	F.	18.0	20.5	22.0	28.3	30.4	32.4	38.6	40.3	42.7	30 30.36	− 1.07	−10.93	−10.89	16 30 18.40	+ 0.04
	19	η Herculis . . .	F.	32.5	35.7	37.6	45.4	48.0	50.7	58.7	0.6	3.9	38 48.10	− 0.12	−10.90	−10.89	16 38 37.09	+ 0.02
	20	α^1 Herculis . . .	F.	56.9	59.6	1.2	7.5	9.7	11.7	18.0	19.6	22.3	9 9.61	− 0.64	−10.87	−10.90	17 8 58.07	− 0.01
18	21	ζ Aquilæ. . . .	F.	40.1	42.8	44.4	50.6	52.7	54.8	1.1	2.7	5.4	59 52.73	− 0.66	−10.98	−10.95	18 59 41.12	+ 0.11
	22	γ Aquilæ. . . .	F.	19.6	22.1	23.9	30.0	32.0	34.0	40.4	42.0	44.7	40 32.08	− 0.72	−10.92	−10.97	19 40 20.39	− 0.02
	23	α Aquilæ. . . .	F.	42.0	44.4	46.0	52.2	54.3	56.3	2.5	4.0	6.7	44 54.27	− 0.75	−10.95	−10.97	19 44 42.55	+ 0.02
	24	ϖ Piscium . . .	F.	. .	. .	4.2	6.3	. .	12.4	16.5	18.0	20.6	53 8.29	− 0.78	−11.05	−11.09	23 52 56.42	− 0.03
	25	B. A. C. 8376 . .	F.	2.0	5.5	7.5	15.5	18.4	21.0	29.2	31.0	34.5	1 18.29	− 1.77	. .	−11.16	0 1 5.36	− 3.48
	26	B. A. C. 2 . . .	F.	. .	. .	. .	. .	. .	. .	8.0	10.0	13.0	1 58.20	− 1.57	. .	−11.16	0 1 45.47	− 3.36
	27	B. A. C. 24 . .	F.	23.6	26.7	28.6	36.1	38.8	41.2	48.8	50.6	53.7	5 38.68	− 1.61	. .	−11.16	0 5 25.91	− 3.40
	28	21 Cassiopeæ. . .	F.	. .	. .	29.4	37.3	44.2	52.2	7.4	13.0	22.4	37 36.96	+ 2.40	. .	−11.11	0 37 28.25	+ 0.05
	29	ε Piscium . . .	F.	. .	. .	. .	. .	. .	. .	50.9	52.5	55.2	56 42.74	− 0.76	−11.28	−11.12	0 56 30.86	+ 0.18
	30	Polaris	F.	. .	. .	58.0	24.0	51.0	16.0	43.0	. .	. .	12 50.40	+37.57	. .	−11.12	1 13 16.85	− 0.80
	31	Neptune . . .	F.	43.7	46.3	52.2	54.4	56.5	58.5	0.4	6.1	8.7	55 56.31	− 0.72	. .	−11.19	1 55 44.40	. .
	32	ξ^1 Ceti.	F.	25.8	28.5	29.9	36.2	38.1	40.1	46.4	48.0	50.6	6 38.18	− 0.74	−11.21	−11.15	2 6 26.29	+ 0.10
	33	Lalande 4803 . .	F.	17.5	20.0	21.4	27.6	29.6	31.7	37.8	39.4	42.2	29 29.69	− 0.78	. .	−11.19	2 29 17.72	− 3.80
	34	α Ceti.	F.	48.5	51.0	52.6	58.7	0.7	2.7	8.8	10.3	13.0	56 0.70	− 0.82	−11.18	−11.17	2 55 48.71	+ 0.03
	35	δ Leonis	F.	29.8	32.4	34.0	40.5	42.8	45.0	51.7	53.1	55.9	7 42.80	− 0.51	−11.30	−11.39	11 7 30.90	− 0.15
	36	Anonymous . .	F.	47.7	50.8	52.8	58.1	. .	8.2	13.4	15.1	18.3	20 3.05	− 1.62	. .	−11.32	11 19 50.11	− 2.53
	37	β Leonis	F.	43.4	46.0	47.5	53.9	56.0	58.1	4.4	6.0	8.7	42 56.00	− 0.62	−11.35	−11.40	11 42 43.98	− 0.07
	38	Moon II, S. . .	F.	. .	. .	8.9	10.9	13.0	15.0	17.1	. .	. .	45 12.98	− 0.85	. .	−11.33	11 45 0.80	−63.78
19	39	Freia	Sk.	37.2	39.1	43.3	45.4	48.0	50.3	52.4	56.2	58.2	22 47.79	− 0 60	. .	−11.45	4 22 35.74	. .
	40	9 Camelopardalis .	Sk.	26.0	32.3	36.3	51.3	56.6	1.4	16.8	20.4	26.7	41 56.42	+ 1.46	. .	−11.51	4 41 46.37	0.00
	41	ι Aurigæ . . .	Sk.	53.6	56.5	58.4	5.8	8.2	10.5	18.0	19.7	22.7	49 8.16	− 0.28	−11.49	−11.51	4 48 56.37	− 0.06
	42	ε Ursæ Minoris, S.P.	Sk.	27.6	8.7	56.5	11.6	56.7	42.0	56.5	45.3	25.4	58 56.70	− 8.75	. .	−11.51	16 58 36.44	+ 0.25
	43	β Orionis . . .	Sk.	36.2	39.0	40.4	46.6	48.6	50.7	56.9	58.5	1.0	8 48.66	− 1.16	−11.56	−11.52	5 8 35.98	+ 0.04
	44	β Tauri	Sk.	. .	. .	. .	. .	. .	. .	49.7	51.3	54.2	18 40.28	− 0.39	−11.41	−11.52	5 18 23.37	− 0.13
	45	δ Orionis. . . .	Sk.	41.9	44.3	45.8	52.0	54.0	56.0	2.2	3.7	6.3	25 54.02	− 1.00	−11.51	−11.52	5 25 41.50	− 0.04
	46	α Leporis . . .	Sk.	7.0	9.7	11.3	27.7	29.9	32.0	38.5	40.0	42.7	27 29.87	− 1.37	−11.49	−11.52	5 27 16.98	− 0.07
	47	ε Orionis. . . .	Sk.	56.8	59.4	0.9	7.0	9.2	11.2	17.3	18.8	21.4	30 9.11	− 1.02	−11.61	−11.53	5 29 56.56	+ 0.07
	48	μ Geminorum . .	Sk.	27.6	30.4	32.0	38.5	40.8	43.0	49.6	51.3	54.2	15 40.82	− 0.53	−11.50	−11.54	6 15 28.75	− 0.08
	49	γ Geminorum . .	Sk.	33.6	36.4	37.9	44.0	46.2	48.4	54.8	56.4	59.0	30 46.30	− 0.66	−11.51	−11.55	6 30 34.09	− 0.07
	50	51 Cephei	Sk.	48.5	42.0	14.0	. .	. .	. .	. .	. .	. .	42 2.94	+20.96	. .	−11.55	6 42 12.35	− 0.39

11, 12, 39. Wire A used.
15, 28, 38, 42. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	32 32	10 3.2	0.2	9.7	2.3	37	. .	230	. . .	120	. .	34.5	32 35 15.7	. .	+ 39.9	83 42 16.8	+22.4
2	36 6	4.5	2.2	12.5	4.2	33	. .	855	. .	. .	. .	34.5	36 10 5.5	. .	+ 45.6	87 17 12.3	+ 2.1
3	12 4	1.0	28.2	10.5	0.9	32	. .	025	. .	850	. .	34.5	12 8 21.9	. .	+ 13.4	63 14 56.5	+26.9
4	35 12	4.5	1.0	12.1	5.0	31	. .	510	. .	380	. .	34.5	35 16 41.6	16.5	+ 44.2	86 23 47.0	+ 0.7
5	18 14	12.2	10.2	21.0	13.2	32	. .	700	. .	900	. .	34.5	18 18 12.5	. .	+ 20.7	69 24 54.4	+ 6.6
6	351 26	3.7	2.0	12.7	3.3	33	. .	. .	. .	170	210	34.5	351 30 14.5	. .	− 9.4	42 36 26.3	+ 0.8
7	15 6	3.3	29.5	10.8	4.0	34	. .	. .	. .	170	130	34.5	15 10 0.5	. .	+ 17.0	66 16 38.7	+ 2.2
8	7 18	1.0	0.0	11.0	2.7	32	. .	340	. .	210	. .	34.5	7 22 31.1	. .	+ 8.1	58 29 0.4	+ 1.5
9	52 40	4.5	0.3	11.5	4.5	34	. .	330	. .	180	. .	34.5	52 43 59.0	. .	+ 1 22.1	103 51 42.3	+ 3.0
10	23 30	9.2	6 7	16.9	8.9	36	. .	030	. .	900	. .	34.5	23 33 27.7	. .	+ 27.3	74 40 16.2	+ 2.1
11	17 44	1.5	28.3	10.8	2.3	39	120	990	. .	. .	. .	34.5	17 49 21.2	. .	+ 20.1	68 56 2.5	− 1.7
12	19 14	5.3	2.2	15.2	5.7	36	. .	210	. .	935	. .	34.5	19 20 1.6	. .	+ 22.0	70 26 44.8	− 1.5
13	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
14	5 52	4.8	1.8	14.0	5.3	36	. .	860	. .	710	. .	34.5	5 55 19.2	15.5	+ 6.5	57 1 46.9	+ 2.0
15	326 34	9 27.5	24.3	8.1	1.1	33	. .	. .	. .	956	956	33.9	326 38 7.8	15.2	− 41.3	17 43 47.7	+ 1.9
16	11 42	28.8	24.7	9.3	0.8	35	. .	996	. .	906	. .	33.9	11 45 36.9	. .	+ 13.1	62 52 11.2	+ 0.8
17	32 0	10 2.9	28.5	11.5	3.6	33	. .	890	. .	790	. .	33.9	32 4 5.9	. .	+ 39.3	83 11 6.4	+ 1.9
18	49 8	9 28.5	25.2	7.4	0.7	36	. .	. .	. .	796	730	33.9	49 11 23.5	. .	+ 1 12.3	100 18 57.0	+ 1.8
19	359 40	10 0.5	29.3	12.6	3.9	33	. .	060	. .	960	. .	33.9	359 44 18.9	17.4	− 0.3	50 50 39.8	+ 3.2
20	24 18	1.8	27.6	11.9	4.2	36	. .	. .	. .	716	700	33.9	24 21 21.1	. .	+ 28.2	75 28 10.5	+ 2.5
21	25 8	9 27.6	24.6	8.3	0.2	32	. .	784	. .	620	. .	33.9	25 12 27.3	. .	+ 29.2	76 19 17.7	+ 2 3
22	28 30	10 0.6	27.5	10.0	3.3	32	. .	578	. .	458	. .	33.9	28 34 27.4	. .	+ 33.5	79 41 22.1	+ 1.6
23	30 16	9 28.1	23.8	6.5	28.8	32	208	148	. .	010	966	33.9	30 20 37.7	21.5	+ 36.2	81 27 35.1	+ 1.5
24	32 38	27.6	23.6	5.6	27.7	33	. .	. .	. .	024	970	34.2	32 42 23.5	18.2	+ 40.0	83 49 24 7	+ 3.1
25	79 54	28.5	23.6	4.1	29.2	33	054	032	. .	. .	. .	34.2	79 58 24.6	. .	+ 5 40.7	131 10 26.5	+ 5.8
26	73 0	10 1.6	26.0	7.8	1.5	35	. .	. .	. .	450	420	34.2	73 3 42.6	. .	+ 3 22.0	124 13 25.8	+ 7.8
27	74 36	3.4	27.3	7.2	2.4	35	. .	198	. .	036	. .	34.2	74 39 48.0	. .	+ 3 43.9	125 49 53.1	+ 7.4
28	324 32	9 28.1	24.7	6.5	0.4	36	. .	. .	. .	450	. .	34.2	324 35 30.3	. .	− 44.2	15 41 7.3	+ 0.3
29	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
30	310 12	10 2.6	28.4	10.1	4.8	35	. .	. .	500	. .	. .	34.2	310 15 40.9	. .	− 1 13.4	1 20 48.7	+ 2.2
31	28 52	5.3	1.4	12.8	6.5	31	. .	. .	. .	324	. .	34.2	28 56 41.5	. .	+ 34.4	80 3 37.1	. .
32	30 34	9 29.7	26.5	7.4	0.8	38	. .	050	. .	986	. .	34.2	30 37 5.3	. .	+ 36.9	81 44 3.4	+ 0.5
33	32 32	10 0.0	24.8	5.8	29.5	37	. .	. .	. .	380	360	34.2	32 35 15.1	18.5	+ 39.8	83 42 16.1	+22.3
34	35 12	0.7	25.8	7.5	1.3	31	. .	828	. .	704	. .	34.2	35 16 40.8	. .	+ 44.0	86 23 46.0	− 0.4
35	17 36	9 29.2	25.9	8.9	29.6	29	. .	720	. .	610	. .	33.7	17 41 12.9	18.0	+ 20.0	68 47 54.1	+ 1.2
36	74 58	26.3	21.5	2.5	27.1	31	010	000	. .	. .	. .	33.7	75 2 57.2	. .	+ 3 51.4	126 13 9.8	− 4.8
37	23 34	28.9	23.7	4.7	0.1	37	238	220	. .	. .	. .	33.7	23 37 19.9	. .	+ 27.4	74 44 8.5	+ 1.1
38	37 2	10 29.7	24.0	5.5	1.2	37	220	. .	. .	. .	770	33.7	37 4 51.4	18.2	+ 47.3	88 11 59.9	. .
39	19 18	1.2	26.6	9.3	25.0	37	. .	666	. .	524	. .	33.8	19 23 44.2	19.1	+ 22.2	70 30 27.6	− 1.5
40	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	.
41	5 52	9 28.6	26.5	6.5	29.6	37	392	. .	. .	. .	000	33.8	5 55 18.7	. .	+ 6.6	57 1 46.5	+ 1.8
42	301 6	10 2.0	28.5	9.0	3.5	36	240	260	. .	. .	. .	33.8	301 9 29.7	. .	− 1 44.2	352 14 6.7	+ 1.8
43	47 10	2.5	27.3	9.0	1.7	37	. .	650	. .	480	. .	33.8	47 13 10.2	. .	+ 1 8.3	98 20 39.7	+ 0.4
44	10 20	7.5	4.6	15.0	9.0	36	. .	. .	. .	850	770	35.8	10 23 14.5	. .	+ 11.6	61 29 47.3	− 0.6
45	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
46	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
47	40 6	2.9	27.0	10.0	2.5	35	. .	. .	. .	890	846	33.8	40 9 34.5	. .	+ 53.4	91 16 49.1	− 0.2
48	16 14	0.6	28.4	10.3	3.0	31	. .	. .	. .	580	490	33.8	16 18 41.1	. .	+ 18.6	67 25 20.9	+ 0.3
49	22 18	4.4	0.5	12.5	3.5	30	. .	676	. .	542	. .	33.8	22 22 54.2	17.2	+ 26.1	73 29 41.5	+ 1.8
50	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .

No.	Barom.	At. Ther.
	in.	°
4	29.98	19.0
14	29.98	18.5
15	30.04	17.2
19	30.04	19.5
23	30.00	24.0
24	29.98	22.0
33	30.02	21.5
35	30.17	20.5
38	30.17	20.2
39	30.46	22.1
49	30.49	21.2

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
31	− 0.1	. .	. .	− 0.1
38	−33 53.9	− 15 25.9	. .	− 49 19.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Dec. 19	1	η Virginis . . .	Sk.	33.9	36.	37.9	44.0	46.0	48.1	54.3	55.9	58.3	13 46.09	− 1.00	−11.45	−11.68	12 13 33.41	− 0.05
	2	Moon II, S. . .	Sk.	. .	. .	59.7	1.8	3.8	5.9	8.1	. .	. .	31 3.86	− 1.09	. .	−11.79	12 30 50.98	−62.89
	3	12 Canum Venat. .	Sk.	9.4	12.8	14.7	22.7	25.3	27.9	35.8	37.9	41.1	50 25.29	− 0.11	−11.82	−11.69	12 50 13.49	+ 0.13
	4	Polaris, S. P. . .	Sk.	54.0	0.0	5.0	40.5	47.0	16.5	23.0	19.5	31.5	14 12.19	−45.76	. .	−11.70	1 13 14.73	− 1.65
	5	α Virginis . . .	Sk.	39.6	2.1	43.7	50.0	52.0	53.9	0.3	1.8	4.4	18 51.98	− 1.21	−11.81	−11.70	13 18 39.07	+ 0.09
	6	ζ Virginis . . .	Sk.	22.4	24.9	26.5	32.7	34.7	36.7	42.8	44.3	47.0	28 34.67	− 1.00	−11.84	−11.70	13 28 21.97	+ 0.14
	7	B. A. C. 5284 . .	P.	42.2	44.9	46.5	52.8	55.0	57.0	3.3	5.0	7.7	50 54.93	− 0.65	. .	−12.07	15 50 42.21	− 1.46
	8	δ Ophiuchi . . .	P.	50.4	52.9	54.4	0.5	2.5	4.5	10.7	12.3	15.4	8 2.62	− 1.04	−12.08	−11.95	16 7 49.63	+ 0.15
	9	τ Herculis . . .	P.	. .	. .	. .	. .	. .	. .	23.0	25.2	28.9	16 11.08	+ 0.18	. .	−11.96	16 15 59.30	+ 0.23
	10	α Scorpii	P.	. .	55.7	58.0	0.3	2.5	4.9	9.4	11.0	13.8	22 0.26	− 1.53	−12.03	−11.96	16 21 46.77	+ 0.06
	11	A Draconis . . .	P.	. .	. .	9.9	15.7	21.4	27.3	32.6	. .	. .	28 21.38	+ 1.82	. .	−11.96	16 28 11.19	+ 0.04
	12	η Herculis . . .	P.	33.5	36.8	38.7	46.5	49.3	52.0	59.9	1.7	5.1	38 49.28	− 0.08	−12.00	−11.96	16 38 37.24	+ 0.14
	13	κ Ophiuchi . . .	P.	46.9	49.6	51.2	57.3	59.3	1.4	7.5	9.2	11.8	51 59.36	− 0.79	−12.08	−11.97	16 51 46.60	+ 0.15
	14	B. A. C. 5731 . .	P.	29.2	32.3	. .	. .	. .	. .	53.2	54.8	57.9	55 43.57	− 0.31	. .	−12.06	16 55 31.20	− 0.72
	15	Mercury II, C. .	P.	9.1	10.8	15.4	17.6	19.9	22.0	24.5	29.0	30.5	39 19.87	− 1.49	. .	−12.05	17 39 6.33	− 0.17
20	16	Sun I, N. . . .	P.	7.4	10.0	11.7	18.4	20.8	23.0	29.7	31.3	34.0	52 20.70	− 1.46	. .	−12.05	17 52 7.19	. .
	17	Sun II, S. . . .	P.	29.5	32.4	34.3	40.6	42.9	5.2	52.1	53.7	56.4	54 43.01	− 1.46	. .	−12.05	17 54 29.50	. .
	18	Venus I, N. . .	P.	24.7	27.6	29.2	35.8	38.0	0.3	47.0	8.7	51.5	29 38.09	− 1.42	. .	−12.02	19 29 24.65	+ 0.40
	19	Venus, S. . . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	20	γ Aquilæ . . .	P.	20.7	23.3	25.0	31.0	33.2	35.2	41.5	43.0	45.6	40 33.17	− 0.73	−12.00	−12.02	19 40 20.42	+ 0.01
	21	α Aquilæ . . .	P.	42.9	45.6	47.1	53.3	55.4	57.4	3.7	5.2	7.8	44 55.38	− 0.77	−12.04	−12.02	19 44 42.59	+ 0.06
	22	ω Piscium . . .	P.	57.0	59.6	1.1	7.3	9.4	11.5	17.5	19.0	21.6	53 9.33	− 0.82	−12.07	−12.10	23 52 56.41	− 0.02
	23	B. A. C. 8376 . .	P.	3.2	6.6	8.7	14.1	16.8	19.6	22.3	. .	. .	1 19.52	− 1.93	. .	−12.10	0 1 5.49	− 3.44
	24	B. A. C. 2 . . .	P.	. .	. .	57.0	59.4	1.7	4.3	9.4	11.0	14.0	1 59.35	− 1.72	. .	−12.10	0 1 45.53	− 3.33
	25	B. A. C. 5 . . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	26	α Cassiopeæ (R.) .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	27	α Cassiopeæ . . .	P.	. .	. .	. .	. .	. .	. .	54.3	56.8	1.3	33 39.53	+ 0.70	. .	−12.11	0 33 28.12	− 0.13
	28	21 Cassiopeæ . . .	P.	. .	. .	. .	37.5	45.0	52.4	7.6	13.3	22.8	37 37.35	+ 2.97	. .	−12.11	0 37 28.21	+ 0.15
	29	B. A. C. 259 . .	P.	49.0	52.3	54.2	1.9	4.5	7.2	14.9	16.9	20.2	50 4.57	− 0.08	. .	−12.11	0 49 52.38	− 3.09
	30	ε Piscium . . .	P.	. .	. .	. .	. .	. .	. .	51.9	53.4	56.0	56 43.64	− 0.80	−12.16	−12.12	0 56 30.72	+ 0.06
	31	B. A. C. 334 . .	P.	44.8	48.0	49.9	57.3	59.9	2.4	9.8	11.6	14.9	2 59.84	− 0.16	. .	−12.11	1 2 47.57	− 3.24
	32	Polaris	P.	. .	53.0	47.0	13.5	41.0	7.0	. .	. .	. .	12 40.68	+45.33	. .	−12.13	1 13 13.88	− 2.08
	33	B. A. C. 415 . .	P.	3.4	6.6	8.5	13.6	16.0	18.7	21.3	23.9	. .	17 18.72	− 1.80	. .	−12.11	1 17 4.81	− 3.59
	34	ο Piscium (R.) . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	35	ο Piscium . . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	36	β Arietis	P.	47.5	50.3	51.8	58.4	0.6	2.7	9.2	10.8	13.5	48 0.53	− 0.52	−12.13	−12.14	1 47 47.87	+ 0.01
	37	Neptune . . .	P.	39.0	41.6	43.2	49.3	51.5	53.5	59.7	1.3	3.9	55 51.44	− 0.74	. .	−12.12	1 55 38.58	. .
	38	α Arietis	P.	10.8	13.6	15.3	21.8	24.2	26.3	32.9	34.5	37.3	0 24.08	− 0.46	−12.07	−12.15	2 0 11.47	− 0.07
	39	ξ¹ Ceti.	P.	26.8	29.3	30.9	37.0	39.2	41.3	47.4	49.0	51.5	6 39.16	− 0.77	−12.16	−12.15	2 6 26.24	+ 0.05
	40	ι Cassiopeæ (R.) .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	41	ι Cassiopeæ . . .	P.	. .	53.3	58.6	3.7	8.9	14.0	24.4	28.4	34.8	19 3.68	+ 1.64	. .	−12.15	2 18 53.17	+ 0.30
	42	5 Ursæ Minoris, S. P.	P.	55.7	44.7	38.6	12.8	4.2	55.6	29.4	23.4	12.7	28 4.12	− 5.35	. .	−12.15	14 27 46.62	− 0.29
	43	γ Ceti.	P.	54.1	56.6	58.3	4.3	6.3	8.4	14.5	16.0	18.6	37 6.34	− 0.88	−12.17	−12.15	2 36 53.31	+ 0.02
	42	B. A. C. 873 . .	P.	32.0	35.2	37.0	41.6	47.0	49.6	57.3	59.2	2.3	42 47.13	− 1.77	. .	−12.14	2 42 33.22	− 3.74
	45	B. A. C. 879 . .	P.	54.5	57.6	59.4	6.7	9.0	11.5	18.8	20.6	23.7	44 9.09	− 1.67	. .	−12.14	2 43 55.28	− 3.73
	46	B. A. C. 910 . .	P.	23.9	26.5	28.0	34.3	36.4	38.5	44.6	46.2	48.8	50 36.36	− 1.12	. .	−12.14	2 50 23.10	− 3.79
	47	α Ceti.	P.	49.4	52.0	53.5	59.8	1.8	3.8	9.8	11.4	13.9	56 1.71	− 0.87	−12.14	−12.16	2 55 48.68	0.00
	48	B. A. C. 953 . .	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	49	B. A. C. 1005 . .	P.	28.7	31.5	33.3	40.4	42.6	44.8	52.0	53.7	57.0	8 42.67	− 1.60	. .	−12.14	3 8 28.93	− 3.77
	50	B. A. C. 1015 . .	P.	47.7	50.9	52.7	0.3	2.8	5.2	13.0	14.9	18.0	10 2.83	− 1.76	. .	−12.14	3 9 48.93	− 3.77

2, 4, 11, 28, 41, 42, 50. Bisections at sets B and D.
2. Wire A used.
9. Bisections at wires V–VII.
18. Sun shining on barometer.
24, 27. Bisections at wires V and VI.
25. Bisection at wire VIII.
32. Bisections at wires B_3, C_1, C_2, C_3, C_4.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	38 48	9 29.5	23.0	5.0	29.0	36	. .	888	. .	682	. .	34.0	38 51 25.9	. .	+ 51.3	89 58 38.4	+ 0.9
2	43 14	29.9	24.8	7.5	1.3	34	632	. .	918	. .	640	34.0	43 20 38.0	. .	+ 1 0.2	94 27 59.4	. .
3	359 50	28.8	26.9	7.5	1.0	32	. .	280	. .	212	. .	34.0	359 54 33.8	15.5	− 0.1	51 0 54.9	+ 0.8
4	307 30	10 2.0	0.4	12.0	6.1	32	. .	. .	. .	960	840	34.0	307 34 16.6	. .	− 1 22.9	358 39 14.9	+ 1.1
5	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	.	. . . .	. .	. .	. . . .	. .
6	38 46	5.0	29.8	10.5	4.5	32	. .	244	. .	132	. .	34.0	38 50 30.5	15.3	+ 51.4	89 57 43.1	+ 1.9
7	22 44	9 26.0	23.8	5.0	28.8	29	. .	550	. .	420	. .	34.1	22 49 18.6	22.1	+ 26.5	73 56 6.3	−20.0
8	42 10	27.8	23.0	5.8	29.4	30	005	945	. .	810	795	34.1	42 15 11.7	. .	+ 57.0	93 22 29.9	+ 0.5
9	352 14	24.1	20.4	2.8	26.9	36	. .	. .	950	925	915	34.1	352 17 26.3	. .	− 8.5	43 23 39.0	+ 0.2
10	64 56	28.7	23.7	5.8	1.6	31	. .	. .	. .	455	410	34.1	65 0 45.7	. .	+ 2 13.9	116 9 20.8	+ 0.3
11	329 48	25.8	22.8	4.1	29.0	33	. .	. .	220	. .	280	34.1	329 52 21.2	24.7	− 36.3	20 58 6.1	+ 2.6
12	359 40	28.2	24.9	8.0	0.5	33	395	335	. .	185	170	34.1	359 44 19.0	. .	− 0.3	50 50 39.9	+ 2.6
13	29 14	26.6	23.2	5.0	0.0	30	. .	515	. .	385	. .	34.1	29 19 3.5	. .	+ 35.0	80 25 59.7	+ 2.2
14	7 42	24.5	22.3	4.5	28.2	30	595	500	. .	. .	. .	34.1	7 47 4.8	. .	+ 8.5	58 53 34.5	−16.0
15	63 22	27.3	21.8	5.9	0.2	37	. .	310	. .	118	. .	34.1	63 25 19.6	. .	+ 2 3.2	114 33 44.0	. .
16	61 58	10 2.5	28.1	9.8	3.8	32	400	385	. .	. .	. .	34.1	62 2 30.0	. .	+ 1 56.0	113 10 47.2	. .
17	62 30	5.8	1.2	13.5	6.0	29	. .	. .	. .	915	975	34.1	62 35 1.8	30.6	+ 1 59.2	113 43 22.2	. .
18	62 8	9 29.3	23.9	4.4	0.9	34	185	. .	. .	. .	905	34.1	62 12 7.2	35.8	+ 1 55.3	113 20 23.7	. .
19	62 8	29.3	23.9	4.4	0.9	33	. .	475	. .	315	. .	34.1	62 12 17.3	. .	+ 1 55.3	113 20 33.8	. .
20	28 30	25.9	21.9	3.3	29.8	32	845	800	. .	710	705	34.1	28 34 29.1	. .	+ 33.2	79 41 23.5	+ 2.7
21	30 16	26.3	21.3	2.8	28.2	32	145	160	. .	025	005	34.1	30 20 40.1	. .	+ 35.6	81 27 36.8	+ 3.0
22	32 38	26.8	22.7	2.6	27.3	33	155	110	. .	010	965	33.1	32 42 23.9	32.4	+ 39.4	83 49 24.5	+ 2.8
23	79 54	26.6	20.7	0.2	26.6	32	650	680	. .	. .	. .	33.1	79 58 32.0	. .	+ 5 36.2	131 10 29.4	+ 5.7
24	73 0	26.4	20.2	1.3	27.8	35	. .	. .	. .	470	485	33.1	73 3 46.8	. .	+ 3 19.4	124 13 27.4	+ 7.7
25	41 44	25.5	20.6	0.8	26.2	36	. .	. .	. .	. .	225	33.1	41 47 34.9	32.0	+ 54.9	92 54 51.0	+18.2
26	196 54	26.8	23.5	3.9	26.9	35	515	530	. .	. .	. .	33.1	196 57 46.1	. .	+ 18.8	34 8 16.3	− 1.8
27	342 58	26.3	21.8	3.1	28.1	33	. .	. .	. .	470	405	33.1	343 2 17.6	. .	− 18.8	34 8 20.0	+ 1.9
28	324 32	24.1	21.3	1.3	27.0	36	. .	. .	. .	780	795	33.1	324 35 28.0	. .	− 43.7	15 41 5.5	− 1.3
29	1 0	27.0	23.9	4.2	29.0	35	265	220	. .	. .	. .	33.1	1 3 50.9	. .	+ 1.1	52 10 13.2	+32.7
30	31 36	27.5	24.3	4.5	29.3	35	. .	. .	. .	840	810	33.1	31 39 38.8	. .	+ 37.9	82 46 37.9	+ 1.5
31	3 52	24.9	21.5	1.9	26.5	36	. .	310	. .	140	. .	33.1	3 55 36.7	. .	+ 4.2	55 2 2.1	+31.9
32	310 12	25.2	21.6	1.6	28.3	36	150	105	045	050	045	33.1	310 15 38.8	. .	− 1 12.6	1 20 47.4	+ 1.2
33	76 0	26.8	20.7	1.1	26.2	32	855	945	. .	. .	. .	33.1	76 4 28.2	. .	+ 4 4.0	127 14 53.4	+ 9.3
34	149 34	27.6	24.4	4.4	0.3	30	. .	685	. .	. .	. .	33.1	149 38 59.3	. .	− 36.1	81 27 58.0	+ 2.1
35	30 18	23.3	19.6	0.0	25.4	38	. .	. .	. .	. .	680	33.1	30 20 59.2	. .	+ 36.1	81 27 56.5	+ 0.6
36	18 38	28.0	24.8	5.6	29.0	38	130	050	. .	920	. .	33.1	18 41 6.3	. .	+ 20.8	69 47 48.3	+ 2.5
37	28 54	27.7	24.0	4.0	29.0	38	130	105	. .	985	950	33.1	28 57 6.3	. .	+ 34.1	80 4 1.6	. .
38	15 58	10 0.0	26.0	7.0	0.9	39	585	530	. .	420	380	33.1	16 0 42.1	. .	+ 17.7	67 7 21.0	+ 2.5
39	30 34	9 27.2	23.2	3.0	28.0	38	210	185	. .	020	990	33.1	30 37 6.2	29.8	+ 36.5	81 44 3.9	+ 0.9
40	207 52	10 0.8	28.1	7.6	0.9	31	355	375	. .	. .	. .	33.1	207 56 45.2	. .	+ 32.7	23 9 3.3	− 2.7
41	332 0	9 26.3	21.8	1.6	27.7	37	. .	. .	. .	425	430	33.1	332 3 17.2	. .	− 32.7	23 9 5.7	− 0.3
42	295 6	10 2.8	28.5	8.4	4.1	32	890	. .	880	. .	840	33.1	295 10 20.4	. .	− 2 10.5	346 14 31.1	+ 2.6
43	36 6	2.5	27.3	7.6	1.9	34	020	025	. .	910	870	33.1	36 10 5.2	. .	+ 45.0	87 17 11.4	+ 1.0
44	74 50	9 26.7	21.3	1.0	27.6	34	335	325	. .	. .	. .	33.1	74 54 5.9	. .	+ 3 45.1	126 4 12.2	+11.1
45	71 42	27.1	22.5	2.4	27.6	33	. .	520	. .	450	. .	33.1	71 46 17.0	. .	+ 3 5.2	122 55 43.4	+11.8
46	48 12	10 1.0	27.3	6.3	1.3	34	330	260	. .	130	085	33.1	48 16 2.1	. .	+ 1 9.0	99 23 32.3	+17.5
47	35 12	9 28.7	23.2	3.6	28.2	31	920	850	. .	700	690	33.1	35 16 42.2	. .	+ 43.6	86 23 47.0	+ 0.5
48	0 28	10 1.1	28.1	7.7	3.0	34	. .	. .	. .	560	510	33.1	0 31 55.3	. .	+ 0.6	51 38 17.1	+28.6
49	69 4	0.5	25.9	4.9	0.6	37	995	975	. .	. .	. .	33.1	69 7 6.2	. .	+ 2 40.4	120 16 7.8	+12.4
50	74 48	1.8	25.7	4.5	1.4	37	. .	. .	620	. .	610	33.1	74 51 10.3	. .	+ 3 44.5	126 1 16.0	+11.3

No.	Barom.	At. Ther.
	in.	°
3	30.55	19.8
6	30.56	19.0
7	30.58	22.6
11	30.58	25.0
17	30.55	29.4
18	30.53	51.7
22	30.46	34.0
25	30.46	34.0
39	30.43	32.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
2	− 38 3.9	− 15 12.5	. .	− 53 16.4
15	− 5.5	. .	0.0	− 5.5
16	− 8.0	+ 16 17.5	. .	+ 16 9.5
17	− 8.0	− 16 17.5	. .	− 16 25.5
18	− 5.1	+ 5.0	0.0	− 0.1
19	− 5.1	− 5.1	. .	− 10.2
37	− 0.1	. .	. .	− 0.1

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	CORRECTIONS. Inst.	Clock appar'nt.	Clock adopted.	Apparent Right Ascension.	Miscellan'us Corrections.
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Dec. 20	1	B. A. C. 1021 . .	P.	41.4	44.5	46.4	54.0	56.5	59.0	6.6	8.5	11.5	11 56.49	− 1.77	. .	− 12.14	3 11 42.58	− 3.77
	2	B. A. C. 1074 . .	P.	8.5	11.6	13.6	21.0	23.7	26.2	34.0	35.9	38.9	21 23.71	− 1.77	. .	− 12.15	3 21 9.79	− 3.78
	3	B. A. C. 1085 . .	P.	27.8	29.6	34.9	37.4	40.0	42.4	44.9	50.0	51.8	23 39.87	− 1.77	. .	− 12.15	3 23 25.95	− 3.78
	4	B. A. C. 1136² . .	P.	19.0	22.4	24.4	32.4	34.9	37.8	45.9	47.9	51.4	35 35.12	− 1.92	. .	− 12.15	3 35 21.05	− 3.79
	5	B. A. C. 1145 . .	P.	45.4	48.8	50.7	58.9	1.8	4.5	12.8	14.4	18.0	37 1.70	− 1.9	. .	− 12.15	3 36 47.62	− 3.79
	6	B. A. C. 1194 . .	P.	56.4	59.5	1.3	5.9	10.8	15.4	20.0	21.9	25.0	43 10.69	− 1.61	. .	− 12.15	3 42 56.93	− 3.80
	7	ζ Persei	P.	. .	29.0	31.3	33.7	36.0	38.5	43.2	45.0	48.2	46 33.69	− 0.25	−12.08	− 12.17	3 46 21.27	− 0.10
	8	B. A. C. 1236 . .	P.	2.8	6.1	8.0	16.0	18.6	21.3	29.3	31.2	34.6	52 18.66	− 1.87	. .	− 12.15	3 52 4.64	− 3.78
	9	Lutetia	P.	15.5	18.0	19.8	26.4	28.6	30.7	37.5	39.0	41.5	20 28.56	− 0.50	. .	− 12.16	4 20 15.90	. .
	10	B. A. C. 1378 . .	P.	23.3	26.0	27.5	31.6	33.8	35.9	37.9	40.0	. .	21 35.89	− 0.65	. .	- 12.16	4 21 23.08	− 4.43
	11	Freia	P.	. .	. .	. .	. .	. .	. .	16.2	. .	20.4	22 7.46	− 0.54	. .	− 12.16	4 21 54.76	. .
	12	ε Ursæ Minoris, S. P.	P.	. .	27.3	11.9	56.7	42.3	26.5	57.0	45.0	26.4	58 57.08	− 8.87	. .	− 12.20	16 58 36.01	− 0.16
	13	B. A. C. 1588 . .	P.	47.4	49.9	51.5	57.5	59.7	1.7	7.8	9.3	11.9	1 59.63	− 1.04	. .	− 12.17	5 1 46.42	− 4.14
	14	β Orionis. . . .	P.	36.8	39.5	41.0	47.3	49.3	51.3	57.5	59.1	1.7	8 49.28	− 1.10	−12.22	− 12.20	5 8 35.98	+ 0.02
	15	B. A. C. 1633 . .	P.	. .	. .	. .	. .	. .	. .	31.2	33.2	36.4	10 21.19	− 1.77	. .	− 12.17	5 10 7.25	− 3.75
	16	β Tauri	P.	27.0	30.0	31.7	38.7	40.9	43.3	50.3	52.0	54.8	18 40.97	− 0.33	−12.15	− 12.20	5 18 28.44	− 0.07
	17	B. A. C. 1724 . .	P.	59.3	2.4	4.3	12.0	14.6	17.3	24.8	26.9	30.0	24 14.62	− 1.80	. .	− 12.17	5 24 0.65	− 3.72
	18	B. A. C. 1753 . .	P.	41.6	44.9	51.8	54.2	56.7	59.3	1.7	8.5	11.8	28 56.72	− 1.74	. .	− 12.17	5 28 42.81	− 3.73
	19	B. A. C. 1773 . .	P.	55.1	58.0	59.9	7.4	9.8	12.1	19.4	21.3	24.3	31 9.70	− 1.68	. .	− 12.17	5 30 55.85	− 3.75
	20	B. A. C. 1841 . .	P.	24.5	27.4	29.3	36.4	38.8	41.2	48.4	50.3	53.3	41 38.84	− 1.65	. .	− 12.18	5 41 25.01	− 3.75
	21	B. A. C. 1862 . .	P.	21.2	23.7	25.3	31.6	33.7	35.8	42.0	43.6	46.3	45 33.69	− 0.65	. .	− 12.18	5 45 20.86	− 4.62
	22	B. A. C. 1882 . .	P.	40.9	43.9	45.6	52.8	55.0	57.3	4.3	6.0	9.0	48 54.98	− 0.32	. .	− 12.18	5 48 42.48	− 5.15
	23	B. A. C. 1896 . .	P.	18.3	21.0	22.6	29.6	31.9	34.1	40.9	42.6	45.5	50 31.83	− 0.39	. .	− 12.18	5 50 19.26	− 5.03
	24	B. A. C. 1925 . .	P.	13.0	15.8	17.5	24.0	26.3	28.6	35 0	36.7	39.5	54 26.27	− 0.47	. .	− 12.18	5 54 13.62	− 4.90
	25	δ Ursæ Minoris, S. P.	P.	11.0	. .	37.0	2.5	. .	. .	. .	. .	. .	12 27.73	−19.23	. .	− 12.22	18 11 56.28	− 1.16
	26	B. A. C. 2063 . .	P.	0.4	3.2	4.9	11.5	13.8	16.0	22.6	24.3	27.0	18 13.74	− 0.45	. .	− 12.19	6 18 1.10	− 4.96
	27	B. A. C. 2112 . .	P.	3.1	6.2	8.0	15.2	17.7	20.0	27.2	29.2	32.0	24 17.62	− 1.65	. .	− 12.19	6 24 3.78	− 3.67
	28	B. A. C. 2158 . .	P.	28.9	32.0	34.0	41.7	44.2	46.0	54.2	56.0	59.2	29 44.02	− 1.77	. .	− 12 19	6 29 30.06	− 3.61
	29	B. A. C. 2164 . .	P.	. .	. .	. .	28.1	30.6	33.3	38.0	40.0	43.0	30 28.22	− 1.70	. .	− 12.19	6 30 14.33	− 3.64
	30	51 Cephei	P.	50.5	44.0	37.5	22.0	3.5	. .	. .	. .	. .	42 3.94	+21.62	. .	− 12.23	6 42 13.33	+ 0.43
	31	Julia	P.	40.9	44.3	46.3	54.0	56.9	59.4	7.2	9.3	12.4	43 56.74	− 0.04	. .	− 12.19	6 43 44.51	. .
	32	B. A. C. 2288 . .	P.	51.7	54.8	56.6	4.3	6.8	9.2	16.6	18.6	21.8	53 6.71	− 1.74	. .	− 12.20	6 52 52.77	− 3.56
	33	B. A. C. 2309 . .	P.	48.0	50.7	52.6	59.4	1.7	4.0	10.9	12.5	15.6	57 1.71	− 1.53	. .	− 12.20	6 56 47.98	− 3.68
	34	B. A. C. 2340 . .	P.	14.4	17.3	19.2	26.3	28.6	30.9	38.1	39.6	43.0	3 28.63	− 0.28	. .	− 12.20	7 3 16.15	− 5.23
	35	δ Geminorum . .	P.	43.7	46.5	48.1	54.7	56.9	59.0	5.7	7.4	10.1	12 56.90	− 0.48	−12.18	− 12.24	7 12 42.18	− 0.12
	36	B. A. C. 2431 . .	P.	1.6	4.4	6.0	12.6	14.9	17.2	23.9	25.6	28.4	16 14.96	− 0.46	. .	− 12.20	7 16 2.30	− 4.89
	37	B. A. C. 2469 . .	P.	5.7	8.8	10.6	17.5	19.7	22.0	28.9	30.7	33.6	22 19.72	− 0.33	. .	− 12.20	7 22 7.19	− 5.09
	38	B. A. C. 2477¹. .	P.	6.1	9.1	10.9	. .	. .	. .	30.0	31.9	34.7	24 20.45	− 1.63	. .	− 12.20	7 24 6.62	− 3.54
	39	B. A. C. 2477². .	P	. .	. .	16.4	18.6	21.0	23.4	25.7	. .	. .	24 21.02	− 1.63	. .	− 12.20	7 24 7.19	− 3.54
	40	Hygeia . . .	P.	. .	7.3	9.3	11.6	13.6	15.8	20.4	22.0	24.7	42 11.54	− 0.50	. .	− 12.21	7 41 58.83	. .
	41	B. A. C. 2632 . .	P.	26.5	29.1	30.9	37.4	39.5	41.7	48.2	49.9	52.5	48 39.52	− 0.52	. .	− 12.21	7 48 26.79	− 4.70
	42	ω¹ Cancri	P.	25.8	28.8	30.5	37.1	39.5	41.7	48.5	50.2	53.5	53 39.51	− 0.40	. .	− 12.21	7 53 26.90	− 4.90
	43	Lalande 15898 .	P.	13.5	16.3	18.0	24.7	27.0	29.3	36.0	37.7	40.6	2 27.01	− 0 40	. .	− 12.21	8 2 14.40	− 4.87
	44	B. A. C. 2805 . .	P.	39.8	43 0	44.9	52.5	55.0	57.4	5.0	6.8	10.0	16 54.93	− 1.76	. .	− 12.22	8 16 40.95	− 3.29
	45	B. A. C. 2820 . .	P.	41.5	44.6	46.8	54.3	57.0	59.6	7.3	9.3	12.6	18 57.00	− 1.82	. .	− 12.22	8 18 42.96	− 3.25
	46	Groom. 3241, S. P.	P.	. .	. .	. .	. .	. .	. .	17.5	11.0	3.9	30 43.70	− 4.25	. .	− 12.26	20 30 27.19	+ 0.06
	47	B. A. C. 2901 . .	P.	9.7	11.3	15.3	17.3	19.4	21.5	23.5	27.6	29.2	31 19.42	− 0.82	. .	− 12.22	8 31 6.38	− 4.12
	48	B. A. C. 3013 . .	P.	52.8	55.4	57.0	3.0	5.1	7.2	13.4	14.6	17.3	46 5.12	− 0.82	. .	− 12.23	8 45 52.07	− 4.06
	49	B. A. C. 3027 . .	P.	24.9	28.1	30.3	38.2	41.0	43.6	51.8	53.7	57.2	48 40.98	+ 0.02	. .	− 12.23	8 48 28.77	− 5.36
	50	B. A. C. 3081 . .	P.	26.4	29.9	31.8	39.9	42.6	45.0	53.5	55.4	58.8	55 42.59	− 1.92	. .	− 12.23	8 55 28.44	− 3.06

2, 9, 11. Wire A used.
5, 8, 27, 29. Bisections at wires V and VI.
12, 39, 45, 46, 47. Bisections at sets B and D.
43, 50. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	74 56	10 3.9	27.5	6.6	2.2	38	. .	810	. .	800	. .	33.1	74 58 50.4	. .	+ 3 46.3	126 8 57.9	+11.3
2	75 4	0.5	24.9	4.4	0.1	31	785	790	. .	710	610	33.1	75 11 13.4	. .	+ 3 49.5	126 21 24.1	+11.3
3	75 4	0.5	24.9	4.4	0.1	38	. .	715	. .	685	. .	33.1	75 6 54.6	. .	+ 3 48.3	126 17 4.1	+11.3
4	79 30	2.4	27.1	6.1	1.6	35	850	920	. .	. .	. .	33.1	79 33 36.9	. .	+ 5 24.3	130 45 22.4	+10.5
5	79 54	0.2	25.4	4.5	29.9	33	. .	. .	. .	915	880	33.1	79 58 7.4	. .	+ 5 37.1	131 10 5.7	+10.5
6	69 20	1.9	25.8	5.3	1.4	36	400	385	. .	. .	. .	33.1	69 23 30.0	. .	+ 2 42.7	120 32 33.9	+12.2
7	7 18	1.5	28.1	8.6	2.3	32	. .	. .	. .	215	185	33.1	7 22 30.8	. .	+ 8.0	58 29 0.0	+ 1.4
8	78 4	4.2	28.5	7.3	3.6	33	. .	. .	. .	255	260	33.1	78 8 13.8	. .	+ 4 46.5	129 19 21.5	+10.8
9	17 46	9 28.7	25.2	5.7	29.6	38	625	530	. .	. .	. .	33.1	17 51 30.6	. .	+ 19.9	68 58 11.7	− 1.7
10	24 22	10 1.1	27.1	7.2	1.7	37	375	330	. .	. .	. .	33.1	24 25 15.0	. .	+ 28.0	75 32 4.2	+17.9
11	19 20	0.3	26.4	8.1	1.9	38	. .	. .	. .	. .	185	33.1	19 25 31.8	30.1	+ 21.7	70 32 14.7	− 1.5
12	301 6	1.8	27.9	6.7	4.1	36	. .	. .	525	. .	470	33.1	301 9 24.9	. .	− 1 41.6	352 14 4.5	− 0.1
13	44 4	2.4	26.4	5.0	1.0	36	. .	650	. .	565	. .	33.1	44 7 25.6	. .	+ 59.7	95 14 46.5	+12.8
14	47 10	4.1	28.8	8.3	3.2	37	385	290	. .	185	150	33.1	47 13 13.3	. .	+ 1 6.5	98 20 41.0	+ 1.6
15	74 54	3.6	27.0	5.9	2.4	38	. .	. .	. .	020	985	33.1	74 57 1.7	. .	+ 3 45.6	126 7 8.5	+10.2
16	10 20	3.5	29.6	10.0	3.6	37	135	095	. .	985	965	33.1	10 23 16.2	. .	+ 11.3	61 29 48.7	+ 0.8
17	76 6	3.5	27.5	6.4	2.5	36	090	045	. .	. .	. .	33.1	76 9 33.4	. .	+ 4 5.5	127 20 0.1	+ 9.8
18	74 0	4.4	27.0	7.1	3.4	35	955	995	. .	. .	. .	33.1	74 3 34.4	. .	+ 3 32.6	125 13 28.2	+ 9.8
19	72 8	2.0	26.5	5.6	3.3	36	085	050	. .	. .	. .	33.1	72 11 34.1	. .	+ 3 9.5	123 21 4.8	+ 9.8
20	71 8	4.2	27.7	7.1	3.6	35	045	985	. .	. .	. .	33.1	71 11 49.0	. .	+ 2 59.1	122 21 9.3	+ 9.5
21	24 40	3.1	28.7	9.6	3.6	31	355	325	. .	. .	. .	33.1	24 44 45.1	. .	+ 28.4	75 51 34.7	+10.1
22	9 54	9 29.4	27.0	6.1	0.6	34	050	000	. .	. .	. .	33.1	9 58 7.1	. .	+ 10.8	61 4 39.1	+ 9.9
23	12 54	29.0	25.9	7.0	1.2	38	040	030	. .	. .	. .	33.1	12 57 5.7	. .	+ 14.2	64 3 41.1	+ 9.7
24	16 26	10 0.9	27.0	7.4	1.5	36	. .	390	. .	290	. .	33.1	16 29 29.4	30.3	+ 18.2	67 36 8.8	+ 9.2
25	305 28	1.5	28.0	7.0	4.3	30	415	405	. .	. .	. .	33.1	305 31 27.2	. .	− 1 26.1	356 36 22.3	+ 1.1
26	15 18	1.4	27.4	7.0	1.8	31	470	390	. .	. .	. .	33.1	15 22 45.7	. .	+ 16.9	66 29 23.8	+ 6.4
27	71 4	2.6	28.1	5.8	1.7	34	. .	. .	. .	020	970	33.1	71 8 4.0	. .	+ 2 58.6	122 17 23.8	+ 8.0
28	74 54	2.1	26.2	4.5	1.0	33	870	805	. .	. .	. .	33.1	74 58 9.1	. .	+ 3 46.1	126 8 16.4	+ 7.9
29	72 42	3.7	28.1	7.0	4.1	38	. .	. .	. .	125	065	33.1	72 44 59.5	. .	+ 3 16.3	123 54 37.0	+ 7.8
30	311 36	2.0	28.2	7.3	4.0	31	455	445	430	. .	. .	33.1	311 40 43.2	. .	− 1 9.2	2 45 55.2	+ 0.7
31	359 54	9 29.6	26.4	6.3	0.5	35	. .	. .	. .	325	345	33.1	359 57 44.8	. .	0.0	51 4 6.0	0.0
32	74 8	10 5.2	28.8	8.6	3.5	40	. .	020	. .	965	. .	33.1	74 10 35.4	. .	+ 3 34.9	125 20 31.5	+ 7.0
33	66 34	2.7	26.8	7.0	2.6	39	. .	835	. .	640	. .	33.1	66 36 36.5	. .	+ 2 21.9	117 45 19.6	+ 6.2
34	8 22	1.8	28.0	8.3	3.0	31	950	900	. .	. .	. .	33.1	8 26 37.3	. .	+ 9.2	59 33 7.7	+ 0.2
35	16 36	2.5	28.6	9.0	2.4	31	425	360	. .	280	235	33.1	16 40 44.8	28.3	+ 18.5	66 47 24.5	+ 2.8
36	15 38	4.5	0.0	10.9	4.3	32	790	765	. .	720	650	33.1	15 42 21.5	. .	+ 17.4	66 49 0.1	− 0.7
37	10 40	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	.	. . .	. .	. .	. . . .	. .
38	70 22	4.7	28.5	7.4	4.0	33	. .	335	. .	150	. .	33.1	70 26 14.5	. .	+ 2 52.4	121 35 28.1	+ 5.3
39	70 22	4.7	28.5	7.4	4.0	33	660	. .	. .	. .	630	33.1	70 26 8.5	. .	+ 2 52.4	121 35 22.1	+ 5.3
40	17 32	4.0	0.3	9.8	3.9	40	. .	. .	. .	390	310	33.1	17 34 24.0	. .	+ 19.6	68 41 4.8	− 1.1
41	18 36	2.6	29.6	9.8	3.5	31	595	590	. .	. .	. .	33.1	18 40 41.2	. .	+ 20.9	69 47 23.3	− 4.2
42	13 4	2.6	29.1	8.6	2.7	28	. .	295	. .	185	. .	33.1	13 9 31.9	. .	+ 14.5	64 16 7.6	− 5.7
43	12 56	4.8	29.5	10.1	4.0	31	575	510	. .	. .	. .	33.1	12 58 7.4	. .	+ 14.2	64 4 42.8	− 6.8
44	74 52	5.5	28.7	8.0	3.8	37	645	595	. .	. .	. .	33.1	74 55 8.2	. .	+ 3 46.2	126 5 15.6	+ 3.4
45	76 38	3.5	28.4	6.9	1.7	32	760	. .	. .	. .	690	33.1	76 42 23.6	. .	+ 4 16.8	127 53 1.6	+ 3.6
46	290 58	1.5	28.0	6.3	3.5	30	. .	. .	. .	090	060	33.1	291 3 3.6	27.5	− 2 39.6	342 6 45.2	− 1.0
47	32 40	6.3	1.5	10.5	5.7	30	970	. .	. .	. .	895	33.1	32 44 47.8	. .	+ 39.8	83 51 48.8	− 6.1
48	33 0	4.7	0.7	9.1	5.0	31	. .	940	. .	820	. .	33.1	33 4 34.4	. .	+ 40.3	84 11 35.9	− 7.4
49	358 8	4.8	1.3	9.6	5.0	29	. .	345	. .	275	. .	33.1	358 13 13.7	. .	− 1.9	49 19 33.0	−15.4
50	79 32	2.8	27.0	5.4	1.1	31	245	090	. .	. .	. .	33.1	79 34 15.5	. .	+ 5 26.3	130 46 3.0	+ 2.5

No.	Barom.	At. Ther.
	in.	°
11	30.43	32.3
24	30.40	31.8
35	30.40	30.4
46	30.39	29.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Dec. 20	1	B. A. C. 3122	P.	3.3	5.9	7.4	13.7	15.8	17.9	24.0	25.7	28.3	3 15.78	− 0.70	. .	−12.23	9 3 2.85	− 4.14
	2	B. A. C. 3162²	P.	5.5	8.8	10.7	18.5	21.0	23.4	31.3	33.2	36.5	11 20.99	− 0.08	. .	−12.23	9 10 8.68	− 5.02
	3	B. A. C. 3178	P.	28.5	31.5	33.4	40.8	43.4	45.9	53.5	55.2	58.2	13 43.36	− 0.16	. .	−12.23	9 13 30.97	− 4.88
	4	Uranus	P.	23.6	26.1	27.7	34.0	36.2	38.3	44.7	46.3	48.9	29 36.20	− 0.62	. .	−12.24	9 29 23.34	. .
	5	B. A. C. 3295	P.	0.5	3.2	4.8	10.9	13.0	15.0	21.0	22.7	25.3	32 12.93	− 0.83	. .	−12.24	9 31 59.86	− 3.83
	6	B. A. C. 3317	P.	. .	. .	25.7	28.0	30.4	32.7	35.1	. .	. .	36 30.38	− 0.28	. .	−12.24	9 36 17.86	− 4.53
	7	ε Leonis	P.	48.7	51.6	53.2	59.9	2.2	4.4	11.0	12.7	15.5	39 2.13	− 0.43	−12.24	−12.28	9 38 49.42	− 0.10
	8	B. A. C. 3453	P.	34.8	37.6	39.3	45.5	47.7	49.9	56.3	58.0	0.7	0 47.76	− 0.59	. .	−12.24	10 0 34.93	− 3.96
	9	B. A. C. 3469	P.	1.2	3.8	5.4	11.8	14.0	16.0	22.5	24.0	26.8	4 13.94	− 0.61	. .	−12.24	10 4 1.09	− 3.91
	10	B. A. C. 3511	P.	25.5	28.0	29.7	36.3	38.5	40.7	47.4	49.1	52.0	10 38.58	− 0.45	. .	−12.25	10 10 25.88	− 4.06
	11	B. A. C. 3532	P.	39.2	41.7	43.4	49.3	51.5	53.5	59.6	1.0	3.7	14 51.43	− 0.88	. .	−12.25	10 14 38.30	− 3.55
	12	B. A. C. 3539	P.	52.6	55.7	57.6	5.3	7.8	10.2	17.8	19.6	22.9	16 7.72	− 0.13	. .	−12.25	10 15 55.34	− 4.40
	13	B. A. C. 3575	P.	6.9	9.5	11.1	17.4	19.4	21.5	27.7	29.2	31.8	21 19.39	− 0.73	. .	−12.25	10 21 6.39	− 3.66
	14	B. A. C. 3622¹	P.	32.8	35.3	36.9	43.1	45.2	47.2	53.5	55.0	57.6	28 45.18	− 0.75	. .	−12.25	10 28 32.18	− 3.60
	15	B. A. C. 3684	P.	47.4	49.9	51.4	57.6	59.6	11.5	7.7	9.2	12.0	38 59.59	− 0.87	. .	−12.25	10 38 46.47	− 3.41
	16	δ Leonis	P.	30.7	33.5	35.2	41.7	43.9	46.1	52.6	54.4	57.0	7 43.90	− 0.50	−12.33	−12.31	11 7 31.09	− 0.04
	17	δ Crateris	P.	9.4	12.0	13.7	19.8	22.0	24.1	30.4	32.0	34.4	13 21.98	− 1.22	−12.26	−12.31	11 13 8.45	− 0.07
	18	Anonymous	P.	29.5	32.4	34.5	39.6	44.5	49.8	54.7	56.7	59.8	20 44.61	− 1.77	. .	−12.26	11 20 30.58	− 2.61
	19	β Leonis	P.	44.4	47.0	48.8	55.0	57.1	59.3	5.7	7.3	9.7	42 57.14	− 0.63	−12.41	−12.32	11 42 44.19	+ 0.07
	20	η Virginis	P.	34.4	37.1	38.6	44.6	46.6	48.7	54.8	56.4	58.9	13 46.68	− 0.94	−12.27	−12.33	12 13 33.41	− 0.08
	21	β Corvi	P.	52.6	55.4	56.7	3.4	5.7	7.8	14.6	16.2	18.8	28 5.69	− 1.41	−12.34	−12.34	12 27 51.94	− 0.04
	22	12 Canum Venat.	P.	10.0	13.3	15.1	22.9	25.7	28.2	36.1	38.1	41.6	50 25.67	− 0.04	−12.23	−12.34	12 50 13.29	− 0.11
	23	Polaris, S. P.	P.	. .	. .	. .	. .	13.0	48.0	18.0	26.0	21.0	14 12.87	−47.15	. .	−12.35	1 13 13.37	− 2.19
	24	Moon, S.	P.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	25	α Coronæ Borealis	E.	24.2	27.0	28.8	35.6	37.9	40.3	47.2	48.7	51.7	29 37.93	− 0.38	−12.43	−12.47	15 29 25.08	− 0.04
	26	α Serpentis	E.	9.3	11.9	13.4	19.6	21.8	23.8	29.9	31.4	34.1	38 21.69	− 0.80	−12.47	−12.48	15 38 8.41	+ 0.01
	27	ε Coronæ Borealis	E.	28.0	29.6	34.3	36.4	38.7	41.0	43.3	48.0	49.7	52 38.78	− 0.38	. .	−12.48	15 52 25.92	− 0.15
	28	δ Ophiuchi	E.	50.8	53.3	54.9	0.9	3.0	5.0	11.1	12.8	15.4	8 3.02	− 0.99	−12.50	−12.48	16 7 49.55	+ 0.04
	29	τ Herculis	E.	53.8	57.5	59.8	8.6	11.5	14.5	23.6	25.8	29.6	16 11.63	+ 0.19	. .	−12.48	16 15 59.34	+ 0.25
	30	α Scorpii	E.	47.0	49.9	51.6	58.4	0.8	2.9	9.7	11.6	14.4	22 0.70	− 1.45	−12.53	−12.48	16 21 46.77	+ 0.04
	31	η Herculis	E.	. .	. .	44.5	47.0	49.7	52.5	55.0	. .	. .	38 49.74	− 0.07	−12.55	−12.49	16 38 37.18	+ 0.07
	32	κ Ophiuchi	E.	47.4	50.0	51.6	57.8	59.9	2.0	8.0	9.5	12.2	51 59.82	− 0.75	−12.56	−12.49	16 51 46.58	+ 0.11
	33	B. A. C. 5731	E.	29.6	32.6	34.4	41.6	43.9	46.3	53.5	55.4	58.4	55 43.97	− 0.29	. .	−12.48	16 55 31.20	− 0.74
	34	ε Ursæ Minoris	E.	. .	. .	12.0	27.0	42.0	57.0	12.5	. .	. .	58 42.10	+ 6.72	. .	−12.49	16 58 36.40	+ 0.21
	35	α Herculis	E.	58.6	1.2	2.9	9.2	11.4	13.4	19.8	21.3	24.0	9 11.31	− 0.65	−12.51	−12.49	17 8 58.17	+ 0.04
	36	B. A. C. 5834	E.	. .	. .	. .	. .	. .	. .	4.8	6.7	10.0	10 54.59	− 0.13	. .	−12.48	17 10 41.98	− 0.40
	37	Mercury II, C.	E.	2.9	5.8	7.5	14.0	16.2	18.4	25.4	27.3	29.9	46 16.38	− 1.42	. .	−12.48	17 46 2.48	− 0.17
21	38	Sun I, N.	E.	34.4	37.0	38.7	45.2	47.5	49.7	56.5	58.4	0.9	56 47.59	− 1.39	. .	−12.49	17 56 33.71	. .
	39	Sun II, S.	E.	56.9	59.7	1.4	7.9	10.1	12.4	19.0	20.6	23.4	59 10.16	− 1.39	. .	−12.49	17 58 56.28	. .
	40	δ Ursæ Minoris	E.	26.5	10.0	35.0	18.5	53.5	27.5	11.0	36.0	20.5	11 53.17	+16.53	. .	−12.50	18 11 57.20	− 0.20
	41	α Lyræ	E.	39.3	42.7	44.5	52.3	54.9	57.5	5.5	7.5	10.7	32 54.99	− 0.08	−12.38	−12.50	18 32 42.41	− 0.10
	42	δ Draconis	E.	6.5	13.1	17.0	33.0	38.4	43.6	59.6	3.5	10.3	12 38.33	+ 1.59	. .	−12.51	19 12 27.41	− 0.10
	43	δ Aquilæ	E.	17.4	18.7	22.8	24.7	26.8	28.8	30.9	34.9	36.4	19 26.82	− 0.87	−12.64	−12.51	19 19 13.44	+ 0.18
	44	Venus I, S.	E.	48.4	51.2	52.7	59.4	1.6	3.9	10.6	12.2	15.1	35 1.68	− 1.38	. .	−12.50	19 34 47.80	+ 0.40
	45	Venus, N.	E.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	46	γ Aquilæ	E.	. .	. .	. .	. .	. .	. .	42.0	43.5	46.0	40 33.62	− 0.74	−12.44	−12.52	19 40 20.36	− 0.05
	47	α Aquilæ	E.	43.4	46.0	47.5	53.7	55.7	57.9	4.0	5.5	8.2	44 55.77	− 0.77	−12.42	−12.52	19 44 42.48	− 0.06
22	48	Polaris	F.	. .	. .	. .	19.0	45.5	11.5	39.0	. .	. .	12 45.12	+39.42	. .	−12.70	1 13 11.84	− 2.57
	49	B. A. C. 415	F.	4.0	7.3	9.3	16.8	19.3	21.9	29.6	31.3	34.6	17 19.34	− 1.42	. .	−12.79	1 17 5.13	− 3.56
	50	B. A. C. 421	F.	. .	. .	. .	. .	2.0	4.7	9.5	11.5	14.2	17 59.87	− 1.29	. .	−12.79	1 17 45.79	− 3.51

6, 12, 31, 34. Bisections at wires V and VI.
23. Bisections at wires C_3, C_4, C_5, D_1, and D_3.
42, 49. Bisections at sets B and D.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	26 44	9 29.5	25.7	6.5	1.1	30	. .	640	. .	470	. .	33.1	26 48 58.9	. .	+ 31.3	77 55 51.4	—10.6
2	1 30	10 6.4	2.4	13.0	6.0	33	. .	665	. .	565	. .	33.1	1 34 6.0	. .	+ 1.7	52 40 28.9	—17.5
3	3 54	8 25.3 12 24.7	22.0 22.0	1.6 1.8	25.6 26.8	34	. .	110	. .	985	. .	33.1	3 58 40.0	. .	+ 4.3	55 5 5.5	—17.3
4	23 12	10 3.5	0.2	10.2	3.5	30	. .	420	. .	340	. .	33.1	23 16 58.0	. .	+ 26.7	74 23 45.9	. .
5	33 36	4.8	0.3	9.0	3.3	32	730	725	. .	. .	. .	33.1	33 40 23.2	. .	+ 41.3	84 47 25.7	—11.4
6	8 16	3.4	29.8	8.3	3.6	30	. .	. .	. .	455	430	33.1	8 20 56.9	. .	+ 9.1	59 27 27.2	—18.7
7	14 28	1.1	28.0	7.6	1.6	31	. .	480	. .	320	. .	33.1	14 32 44.7	25.4	+ 16.1	65 39 22.0	+ 0.7
8	21 26	6.3	1.9	11.3	5.2	29	. .	140	. .	015	. .	33.1	21 31 16.1	. .	+ 24.5	72 38 1.8	—17.4
9	22 30	6.3	1.0	11.0	5.5	32	. .	935	. .	790	. .	33.1	22 34 18.3	. .	+ 25.8	73 41 5.3	—17.4
10	15 6	4.1	29.3	9.5	4.0	35	. .	135	. .	950	. .	33.1	15 9 46.7	. .	+ 16.8	66 16 24.7	—20.2
11	35 54	2.8	26.0	6.3	1.0	34	190	165	. .	. .	. .	33.1	35 58 3.8	. .	+ 45.1	87 5 10.1	—14.0
12	2 58	3.3	0.5	9.8	4.0	29	. .	. .	. .	760	705	33.1	3 3 7.2	. .	+ 3.3	54 9 31.7	—22.0
13	28 26	3.6	28.4	8.1	2.5	36	. .	520	. .	380	. .	33.1	28 29 26.2	. .	+ 33.8	79 36 21.2	—16.9
14	29 32	1.6	27.0	7.1	1.8	35	. .	965	. .	815	. .	33.1	29 35 36.0	. .	+ 35.3	80 42 32.5	—17.1
15	35 40	3.0	27.5	7.3	2.5	32	. .	465	. .	330	. .	33.1	35 44 28.7	24.1	+ 44.8	86 51 34.7	—15.8
16	17 36	2.4	28.6	9.2	1.5	29	500	490	. .	400	370	33.1	17 41 13.9	. .	+ 19.9	68 47 55.0	+ 1.7
17	52 56	5.9	0.7	10.0	5.1	39	. .	525	. .	430	. .	33.1	52 58 37.4	. .	+ 1 22.5	104 6 21.1	+ 1.8
18	74 58	5.4	29.1	8.0	4.4	35	445	405	. .	. .	. .	33.1	75 1 41.6	. .	+ 3 49.7	126 11 52.5	— 5.2
19	23 32	4.9	2.0	12.3	5.3	28	875	815	. .	725	670	33.1	23 37 20.9	23.0	+ 27.3	74 44 9.4	+ 1.6
20	38 48	4.8	28.0	8.4	2.0	36	. .	315	. .	245	. .	33.1	38 51 28.6	. .	+ 50.3	89 58 40.1	+ 2.3
21	61 30	5.1	29.0	9.0	4.3	33	300	290	. .	180	160	33.1	61 34 14.0	. .	+ 1 54.9	112 42 30.1	+ 1.0
22	359 50	3.3	29.5	9.2	3.5	32	060	050	. .	915	910	33.1	359 54 34.2	. .	— 0.1	51 0 55.3	+ 0.8
23	307 30	4.3	29.5	7.8	5.2	33	175	185	170	050	955	33.1	307 34 15.0	. .	— 1 21.1	358 39 15.1	+ 1.2
24	49 14	5.7	0.0	9.0	4.1	32	. .	. .	. .	775	545	33.1	49 18 14.4	21.6	+ 1 12.6	100 25 48.2	. .
25	11 42	9 29.5	26.0	7.5	29.3	35	. .	730	. .	650	. .	32.9	11 45 40.2	. .	+ 12.8	62 52 14.2	+ 2.9
26	32 0	10 3.9	29.8	11.0	4.5	33	. .	770	. .	590	. .	32.9	32 4 6.7	32.0	+ 38.4	83 11 6.3	+ 1.2
27	11 34	4.0	2.5	13.0	5.3	28	905	835	. .	755	735	32.9	11 39 20.1	. .	+ 12.6	62 45 53.9	+ 1.1
28	42 10	7.4	1.2	13.5	6.5	29	. .	135	. .	090	. .	32.9	42 15 14.2	. .	+ 55.4	93 22 30.8	+ 1.3
29	352 14	0.0	25.7	8.3	3.8	36	. .	540	. .	370	. .	32.9	352 17 27.3	. .	— 8.2	43 23 40.3	+ 1.1
30	64 56	9 27.5	23.3	5.7	0.2	31	. .	160	. .	100	. .	32.9	65 0 51.1	. .	+ 2 9.9	116 9 22.2	+ 1.7
31	359 40	10 6.4	1.8	14.6	4.2	32	. .	. .	. .	700	680	32.9	359 44 19.3	. .	— 0.3	50 50 40.2	+ 2.5
32	29 14	2.1	27.2	9.0	3.0	29	. .	980	. .	835	. .	32.9	29 19 6.4	. .	+ 34.0	80 26 1.6	+ 3.9
33	7 42	9 28.3	26.8	8.3	2.0	30	. .	090	. .	960	. .	32.9	7 47 6.2	. .	+ 8.3	58 53 35.7	—16.3
34	316 36	28.9	27.2	6.5	2.5	32	. .	. .	. .	110	240	32.9	316 40 34.0	. .	— 57.0	7 45 58.2	+ 2.5
35	24 18	10 1.5	27.6	9.0	2.1	36	. .	725	. .	600	. .	32.9	24 21 23.3	. .	+ 27.4	75 28 11.9	+ 3.2
36	1 52	9 26.3	22.9	5.0	28.7	31	. .	. .	. .	330	310	32.9	1 56 48.5	. .	+ 2.1	53 3 11.8	—14.9
37	63 30	10 2.8	27.3	9.3	2.2	35	. .	920	. .	770	. .	32.9	63 33 35.2	40.8	+ 2 0.2	114 41 56.6	. .
38	62 0	3.0	27.5	8.0	3.8	38	105	. .	. .	. .	. .	32.9	62 3 1.7	. .	+ 1 52.7	113 11 15.6	. .
39	62 32	4.7	27.8	8.2	3.0	35	. .	. .	. .	765	725	32.9	62 35 35.0	. .	+ 1 55.2	113 43 51.4	. .
40	312 14	5.0	1.2	11.2	7.8	32	600	. .	630	. .	680	32.9	312 18 21.2	. .	— 1 5.8	3 23 36.6	— 2.3
41	0 10	8.3	4.5	15.1	7.7	35	. .	. .	. .	490	470	32.9	0 13 34.2	. .	+ 0.2	51 19 55.6	— 1.3
42	331 24	5.0	28.3	8.5	4.5	35	680	. .	. .	. .	570	32.9	331 27 37.8	. .	— 32.4	22 33 26.6	— 0.2
43	35 56	2.0	9.8	28.2	3.2	30	. .	. .	. .	410	310	32.9	36 0 57.8	. .	+ 43.3	87 8 2.3	+ 4.1
44	61 58	1.8	26.8	6.5	2.0	34	375	. .	. .	. .	205	32.9	62 2 0.0	. .	+ 1 51.5	113 10 12.7	. .
45	61 58	1.8	26.8	6.5	2.0	35	. .	140	. .	005	. .	32.9	62 1 48.2	. .	+ 1 51.5	113 10 0.9	. .
46	28 30	3.7	1.0	10.5	4.8	32	. .	. .	. .	040	010	32.9	28 34 30.6	. .	+ 32.4	79 41 24.2	+ 3.3
47	30 16	5.4	1.2	10.3	4.4	31	445	395	. .	250	210	32.9	30 20 42.2	. .	+ 34.8	81 27 38.2	+ 4.1
48	310 12	2.8	27.7	5.4	1.5	35	. .	882	900	888	. .	32.7	310 15 35.6	. .	— 1 8.9	1 20 47.9	+ 2.0
49	76 0	9 29.6	24.5	1.1	25.7	31	976	. .	. .	. .	906	32.7	76 4 40.1	. :	+ 3 51.6	127 14 52.9	+ 9.0
50	70 22	10 3.3	27.5	4.2	29.8	31	. .	. .	. .	900	844	32.7	70 26 36.2	. .	+ 2 43.1	121 35 40.5	+10.6

No.	Barom.	At. Ther.
	in.	°
7	30.35	27.9
15	30.36	26.5
19	30.34	26.3
24	30.34	24.4
26	30.35	31.5
37	30.33	38.2

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
4	— 0.2	. . .	. .	— 0.2
24	—41 35.9	— 15 2.2	. .	— 56 38.1
37	— 5.5	. . .	0.0	— 5.5
38	— 8.0	+ 16 17.9	. .	+ 16 9.9
39	— 8.0	— 16 17.9	. .	— 16 25.9
44	— 5.1	— 5.9	. .	— 11.0
45	— 5.1	+ 5.9	0.0	+ 0.8

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s	s.	h. m. s.	s.
Dec. 22	1	*o* Piscium . . .	F.	. .	. .	0.6	2.6	4.7	6.7	8.7	. .	. .	39 4.66	− 0.60	−12.87	−12.70	1 38 51.36	+ 0.14
	2	β Arietis	F.	48.0	50.7	52.4	58.9	1.0	3.2	9.8	11.2	14.0	48 1.02	− 0.40	−12.80	−12.70	1 47 47.92	+ 0.12
	3	Neptune . . .	F.	34.3	37.0	38.5	44.6	46.7	48.8	55.0	56.5	59.2	55 46.73	− 0.58	. .	−12.78	1 55 33.37	. .
	4	α Arietis	F.	11.4	14.0	15.7	22.4	26.8	29.0	. .	35.0	37.9	0 24.58	− 0.36	−12.68	−12.70	2 0 11.52	− 0.01
	5	ξ^1 Ceti	F.	27.4	30.0	31.5	37.6	39.7	41.7	48.0	49.4	52.2	6 39.72	− 0.61	−12.89	−12.70	2 6 26.41	+ 0.23
	6	ι Cassiopeæ (R.) .	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	7	ι Cassiopeæ . . .	F.	. .	. .	. .	. .	. .	. .	25.0	28.9	35.4	19 4.21	+ 1.43	. .	−12.70	2 18 52.94	+ 0.12
	8	Lalande 4803 . .	F.	18.7	21.3	22.8	. .	. .	. .	39.3	40.8	43.5	29 31.07	− 0.64	. .	−12.78	2 29 17.65	− 3.79
	9	Weisse 794 . .	F.	16.4	19.1	20.6	26.7	28.9	31.0	37.0	38.4	41.0	47 28.79	− 0.67	. .	−12.77	2 47 15.35	− 3.86
	10	B. A. C. 953 . .	F.	11.8	15.2	17.0	24.9	27.6	30.0	38.0	39.8	43.3	57 27.51	− 0.01	. .	−12.77	2 57 14.73	− 4.51
	11	B. A. C. 1009 . .	F.	. .	. .	19.9	22.4	25.2	27.7	30.3	. .	. .	9 25.10	− 1.47	. .	−12.77	3 9 10.86	− 3.76
	12	B. A. C. 1037 . .	F.	. .	10.8	13.1	15.4	. .	19.8	24.0	25.7	28.5	14 15.28	− 1.11	. .	−12.77	3 14 1.40	− 3.78
	13	B. A. C. 1074 . .	F.	9.0	12.3	19.2	21.7	24.3	26.6	29.2	36.1	39.3	21 24.19	− 1.40	. .	−12.77	3 21 10.02	− 3.76
	14	B. A. C. 1085 . .	F.	25.0	28.3	30.0	37.8	40.3	42.9	50.2	52.0	55.2	23 40.19	− 1.40	. .	−12.77	3 23 26.02	− 3.77
	15	B. A. C. 1312 . .	F.	28.0	31.3	33.3	41.6	44.2	46.6	54.3	56.3	59.6	9 43.91	− 1.42	. .	−12.76	4 9 29.73	− 3.78
	16	B. A. C. 1372 . .	F.	23.8	28.5	33.7	36.3	38.5	41.0	43.5	48.4	53.6	19 38.59	− 1.35	. .	−12.76	4 19 24.48	− 3.79
	17	B. A. C. 1378 . .	F.	23.7	26.3	27.9	34.0	36.2	38.4	40.5	. .	. .	21 36.27	− 0.56	. .	−12.75	4 21 23.01	− 4.44
	18	B. A. C. 1389 . .	F.	. .	. .	. .	. .	45.8	48.3	53.9	55.7	59.3	22 43.03	− 1.51	. .	−12.75	4 22 28.77	− 3.76
	19	9 Camelopardalis (R.)	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	20	9 Camelopardalis .	F.	. .	. .	47.8	52.8	57.8	2.8	8.0	. .	. .	41 57.84	+ 1.36	. .	−12.69	4 41 46.51	+ 0.13
	21	ι Aurigæ. . . .	F.	. .	. .	4.4	6.8	9.3	11.6	14.1	. .	. .	49 9.24	− 0.15	−12.68	−12.69	4 48 56.40	− 0.05
	22	B. A. C. 1588 . .	F.	. .	. .	. .	56.0	58.0	0.1	2.0	4.0	. .	1 0.02	− 0.82	. .	−12.75	5 0 46.45	− 4.15
	23	β Orionis. . . .	F.	37.4	39.9	41.3	47.6	49.6	51.7	58.0	59.4	1.9	8 49.64	− 0.87	−12.80	−12.69	5 8 36.08	+ 0.11
	24	β Tauri	F.	27.5	30.4	32.2	39.2	41.4	43.7	50.7	52.4	55.4	18 41.43	− 0.24	−12.68	−12.69	5 18 28.50	− 0.03
	25	B. A. C. 1724 . .	F.	. .	. .	9.6	12.1	14.9	17.3	20.0	. .	. .	24 14.78	− 1.42	. .	−12.74	5 24 0.62	− 3.73
	26	δ Orionis. . . .	F.	. .	. .	51.0	53.1	55.1	57.2	59.1	. .	. .	25 55.10	− 0.75	−12.82	−12.69	5 25 41.66	+ 0.10
	27	B. A. C. 1862 . .	F.	21.6	24.2	25.7	32.2	34.2	36.2	42.6	44.1	46.9	45 34.19	− 0.51	. .	−12.74	5 45 20.92	− 4.64
	28	B. A. C. 1896 . .	F.	18.8	21.6	23.2	30.0	32.3	34.6	41.3	43.0	46.0	50 32.31	− 0.30	. .	−12.74	5 50 19.27	− 5.05
	29	B. A. C. 2016 . .	F.	28.6	30.1	34.6	37.0	39.2	41.4	43.6	48.0	49.7	9 39.13	− 0.34	. .	−12.73	6 9 26.06	− 4.99
	30	Julia	F.	1.2	4.4	6.4	14.4	17.0	19.6	27.7	29.5	32.6	41 16.98	0.00	. .	−12.73	6 41 4.25	. .
	31	47 Geminorum . .	F.	42.4	45.1	46.8	53.5	55.9	58.0	5.1	6.9	9.7	3 55.96	− 0.27	. .	−12.72	7 3 42.97	− 5.12
	32	a^2 Geminorum . .	F.	41.0	44.0	45.8	53.1	55.5	57.9	5.2	7.0	10.0	26 55.50	− 0.16	−12.76	−12.69	7 26 42.65	+ 0.31
	33	Anonymous . .	F.	44.0	46.9	48.7	55.6	57.9	0.2	7.2	8.8	11.7	37 57.89	− 0.41	. .	−12.72	7 37 44.76	− 4.76
	34	φ Geminorum . .	F.	54.9	57.8	59.4	6.3	8.5	10.8	17.8	19.4	22.4	46 8.59	− 0.27	−12.59	−12.69	7 45 55.63	− 0.18
	35	ω^1 Cancri	F.	26.3	29.1	30.8	37.6	39.9	42.1	48.8	50.6	53.4	53 39.84	− 0.30	. .	−12.71	7 53 26.83	− 4.95
	36	Lalande 15898 .	F.	13.8	16.8	22.9	25.2	27.4	29.7	32.1	38.1	41.2	2 27.47	− 0.35	. .	−12.71	8 2 14.41	− 4.93
	37	B. A. C. 3027 . .	F.	. .	. .	. .	41.5	44.2	46.9	52.4	54.3	57.6	48 41.50	− 0.05	. .	−12.70	8 48 28.75	− 5.43
	38	σ^2 Ursæ Majoris . .	F.	9.6	16.1	20.4	36.8	41.9	47.1	3.2	7.4	14.2	59 41.86	+ 1.52	. .	−12.68	8 59 30.70	− 0.05
	39	B. A. C. 3122 . .	F.	3.5	6.4	8.0	13.9	16.1	18.2	24.5	26.0	28.6	3 16.13	− 0.54	. .	−12.70	9 3 2.89	− 4.20
	40	B. A. C. 3165 . .	F.	46.9	50.2	51.8	59.6	2.0	4.5	12.5	14.4	17.2	11 2.12	− 1.41	. .	−12.70	9 10 48.01	− 3.14
	41	B. A. C. 3178 . .	F.	. .	. .	38.9	41.3	43.9	46.4	48.8	. .	. .	13 43.86	− 0.10	. .	−12.70	9 13 31.06	− 4.95
	42	B. A. C. 3192 . .	F.	. .	. .	41.8	44.3	46.8	49.0	53.7	55.5	58.8	15 44.26	− 1.28	. .	−12.70	9 15 30.28	− 3.23
	43	Uranus. . . .	F.	12.9	15.4	17.1	23.5	25.6	27.6	34.0	35.5	38.3	29 25.54	− 0.48	. .	−12.69	9 29 12.37	. .
	44	B. A. C. 3295 . .	F.	1.0	3.7	9.2	11.2	13.3	15.3	17.4	23.0	25.7	32 13.31	− 0.66	. .	−12.69	9 31 59.96	− 3.89
	45	B. A. C. 3321 . .	F.	0.1	2.5	4.3	10.6	12.7	14.7	21.1	22.7	25.2	37 12.66	− 0.50	. .	−12.69	9 36 59.47	− 4.09
	46	μ Leonis	F.	42.7	45.6	47.3	54.2	56.5	58.6	5.6	7.2	10.2	45 56.43	− 0.28	−12.74	−12.68	9 45 43.47	+ 0.05
	47	79 Draconis, S. P. .	F.	12.8	4.5	58.9	38.3	31.9	23.8	3.2	58.3	49.2	51 31.21	− 3.86	. .	−12.68	21 51 14.67	− 0.52
	48	α Leonis	F.	47.4	50.0	51.6	57.8	59.8	1.9	8.3	9.7	12.5	1 59.89	− 0.54	−12.65	−12.68	10 1 46.67	− 0.07
	49	32 Ursæ Majoris .	F.	44.5	50.8	54.5	9.3	14.4	19.3	34.3	37.9	44.2	9 14.36	+ 1.31	. .	−12.68	10 9 2.99	+ 0.02
	50	γ^1 Leonis	F.	8.8	11.5	13.2	17.5	21.8	26.1	30.4	32.0	34.9	13 21.80	− 0.40	−12.67	−12.68	10 13 8.72	− 0.03

6. Bisections at wires II and III.
11, 20, 38, 47. Bisections at sets B and D.
13, 30, 31. Wire A used.
36. Wire B used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° '	r. "	"	"	"							"	° ' "	°	' "	° ' "	"
1	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	47.2	. .	. . . .	. .
2	18 38	9 29.6	27.4	4.3	28.2	37	956	932	. .	778	764	32.7	18 41 7.6	. .	+ 19.8	69 47 48.6	+ 2.7
3	28 54	10 1.6	27.6	4.5	29.4	36	. .	412	. .	350	. .	32.7	28 57 29.2	. .	+ 32.5	80 4 22.9	. .
4	15 58	2.8	0.3	7.3	0.2	39	. .	392	. .	244	. .	32.7	16 0 42.4	. .	+ 16.8	67 7 20.4	+ 1.9
5	30 34	3.3	29.5	5.8	0.7	37	836	786	. .	628	600	32.7	30 37 7.2	. .	+ 34.8	81 44 3.2	+ 0.1
6	207 52	6.9	4.3	10.0	4.0	30	. .	880	932	. .	. .	32.7	207 56 47.6	. .	+ 31.2	23 9 2.4	− 3.2
7	332 0	2.6	28.7	4.0	0.1	37	. .	. .	. .	076	016	32.7	332 3 18.4	. .	− 31.2	23 9 8.4	+ 2.8
8	32 32	4.1	0.4	6.4	0.2	36	. .	944	. .	886	. .	32.7	32 35 19.0	. .	+ 37.6	82 42 17.8	+22.4
9	34 12	5.9	0.3	6.8	2.3	31	. .	150	. .	982	. .	32.7	34 16 47.5	. .	+ 40.2	85 23 48.9	+21.1
10	0 28	4.0	0.0	6.2	29.5	34	620	604	. .	490	474	32.7	0 31 56.0	. .	+ 0.5	51 38 17.7	+28.8
11	78 2	7.6	2.7	7.9	3.4	36	. .	. .	. .	082	. .	32.7	78 5 28.7	. .	+ 4 33.7	129 16 23.6	+10.3
12	61 0	7.0	2.0	8.8	3.7	31	. .	970	. .	950	. .	32.7	61 4 32.1	. .	+ 1 46.7	112 12 40.0	+13.8
13	75 4	4.2	28.9	5.3	0.3	31	. .	040	. .	016	. .	32.7	75 11 21.6	41.5	+ 3 40.4	126 21 23.2	+10.8
14	75 4	4.2	28.9	5.3	0.3	37	. .	956	. .	822	. .	32.7	75 7 4.4	. .	+ 3 39.3	126 17 4.9	+10.8
15	76 6	11.5	6.6	10.0	5.7	32	. .	. .	. .	760	636	32.7	76 10 16.2	. .	+ 3 55.9	127 40 33.3	+10.4
16	73 4	1.6	25.7	2.6	27.5	31	544	522	. .	. .	. .	32.7	73 8 45.6	. .	+ 3 13.0	124 18 19.8	+10.7
17	24 22	2.7	29.8	6.5	0.3	37	238	232	. .	. .	. .	32.7	24 25 15.8	. .	+ 26.9	75 32 3.9	+17.8
18	79 34	3.4	28.9	5.0	29.1	37	. .	. .	. .	915	900	32.7	79 37 3.2	. .	+ 5 12.7	130 48 37.1	+ 9.9
19	207 10	5.1	1.9	8.1	0.7	34	870	858	. .	. .	. .	32.7	207 13 49.1	. .	+ 30.4	23 52 1.7	0.0
20	332 42	2.9	27.4	4.8	1.2	33	. .	. .	. .	590	600	32.7	332 46 10.7	. .	− 30.4	23 52 1.5	− 0.2
21	5 52	2.0	0.4	6.6	0.1	37	. .	012	. .	948	. .	32.7	5 55 18.6	42.2	+ 6.1	57 1 45.9	+ 1.5
22	44 4	4.5	29.8	5.8	1.0	36	. .	. .	. .	114	098	32.7	44 7 30.0	. .	+ 57.4	95 14 48.6	+12.5
23	47 10	2.2	27.7	4.7	27.4	37	. .	180	. .	156	. .	32.7	47 13 17.3	. .	+ 1 3.8	98 20 42.3	+ 2.5
24	10 20	1.8	28.8	6.5	29.7	37	178	160	. .	110	096	32.7	10 23 16.9	. .	+ 10.8	61 29 48.9	+ 1.1
25	76 6	5.2	29.6	5.2	0.6	35	398	390	. .	. .	. .	32.7	76 9 43.2	. .	+ 3 55.3	127 19 59.7	+ 9.2
26	39 12	3.4	29.2	6.3	0.2	33	. .	. .	. .	122	. .	32.7	39 16 16.5	. .	+ 48.2	90 23 25.9	+ 0.4
27	24 40	5.2	2.7	9.5	2.9	31	. .	108	. .	992	. .	32.7	24 44 46.5	. .	+ 27.2	75 51 34.9	+10.0
28	12 54	2.6	0.0	7.8	0.4	37	898	844	. .	816	796	32.7	12 57 5.1	43.0	+ 13.6	64 3 39.9	+ 9.8
29	15 2	3.9	0.6	7.7	0.8	32	. .	. .	. .	292	276	32.7	15 6 28.4	43.0	+ 15.9	66 13 5.5	+ 7.4
30	0 0	4.8	2.3	9.2	2.5	43	. .	510	. .	444	. .	32.7	0 4 9.0	. .	+ 0.1	51 10 30.3	0.0
31	11 41	3.8	1.0	8.8	1.3	37	110	044	. .	890	872	32.7	11 49 49.4	. .	+ 12.4	62 56 23.0	+ 0.4
32	6 40	5.1	2.4	9.5	2.2	34	. .	284	. .	160	. .	32.7	6 43 58.3	. .	+ 7.0	57 50 26.5	+ 1.2
33	19 10	4.6	2.5	8.9	3.0	34	. .	288	. .	200	. .	32.7	19 13 58.0	. .	+ 20.6	70 20 39.8	− 3.0
34	11 44	2.4	29.0	7.3	29.8	33	. .	220	. .	086	. .	32.7	11 48 17.4	. .	+ 12.3	62 54 50.9	+ 0.9
35	13 4	0.3	27.1	4.8	28.6	28	. .	. .	. .	308	288	32.7	13 9 32.5	. .	+ 13.8	64 16 7.5	− 5.8
36	12 56	3.5	0.2	8.6	1.3	31	480	462	. .	400	350	32.7	12 58 8.7	42.2	+ 13.6	64 4 43.5	− 7.0
37	358 8	1.8	29.7	7.3	29.8	29	. .	. .	. .	290	292	32.7	358 13 15.5	. .	− 1.8	49 19 34.9	−15.4
38	331 12	8.3	3.4	10.1	5.2	33	. .	325	. .	303	. .	32.7	331 16 10.2	. .	− 32.3	22 21 59.1	− 0.2
39	26 44	4.2	0.1	7.6	0.4	30	. .	318	. .	196	. .	32.7	26 49 0.6	. .	+ 29.8	77 55 51.6	−10.9
40	75 40	4.5	29.8	5.8	1.2	36	. .	290	. .	. .	. .	32.7	75 43 29.2	. .	+ 3 47.4	126 53 37.8	+ 0.4
41	3 54	1.0	9.4	6.2	28.4	31	. .	554	. .	524	. .	32.7	3 58 40.5	. .	+ 4.1	55 5 5.8	−17.4
42	70 2	3.5	28.7	5.2	0.7	37	. .	. .	. .	646	634	32.7	70 5 7.0	. .	+ 2 41.2	121 14 9.4	− 1.1
43	23 12	3.4	1.3	7.8	0.7	34	. .	090	. .	054	. .	32.7	23 16 2.0	. .	+ 25.3	74 22 48.5	. .
44	33 36	4.0	0.1	7.3	1.0	32	612	602	. .	. .	. .	32.7	33 40 25.8	42.8	+ 39.2	84 47 26.2	−11.8
45	24 14	1.1	29.1	5.5	29.7	34	. .	652	. .	560	. .	32.7	24 17 55.8	. .	+ 26.6	75 24 43.6	−14.8
46	12 14	1.9	28.9	7.0	29.5	34	. .	082	. .	945	. .	32.7	12 18 4.5	. .	+ 12.8	63 24 38.5	+ 0.7
47	291 58	2.7	0.2	6.0	1.5	29	584	594	. .	600	610	32.7	292 3 11.0	. .	− 2 24.4	343 7 7.8	+ 0.6
48	26 14	5.4	1.1	8.2	3.0	31	. .	000	. .	880	. .	32.7	26 18 48.8	. .	+ 29.1	77 25 39.1	+ 2.1
49	333 6	0.8	27.6	4.6	28.9	31	. .	560	. .	414	. .	32.7	333 10 45.1	. .	− 29.8	24 16 36.5	− 2.9
50	18 20	10.3	8.1	13.1	5.8	28	902	992	. .	. .	. .	32.7	18 25 16.6	. .	+ 19.6	69 31 57.4	+ 1.0

No.	Barom.	At. Ther.
	in.	°
2	30.00	51.0
13	29.96	46.5
21	29.96	46.2
28	29.93	46.0
29	29.93	46.0
36	29.91	46.3
44	29.86	45.5

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	' "	' "	' "	' "
3	— 0.1	. .	. .	— 0.1
43	— 0.2	. .	. .	— 0.2

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Dec. 22	1	B. A. C. 3532	F.	39.6	42.3	43.6	49.5	51.7	53.6	59.8	1.3	4.0	14 51.71	− 0.69	. .	−12.68	10 14 38.34	− 3.62
	2	B. A. C. 3539	F.	. .	. .	. .	. .	. .	. .	18.3	20.2	23.3	16 8.20	− 0.08	. .	−12.68	10 15 55.44	− 4.48
	3	B. A. C. 3622[1]	F.	35.8	37.3	41.5	43.4	45.4	47.5	49.5	53.8	55.3	28 45.50	− 0.59	. .	−12.68	10 28 32.23	− 3.66
	4	δ Leonis	F.	31.0	33.9	35.5	42.0	44.2	46.3	53.0	54.6	57.4	7 44.21	− 0.40	−12.67	−12.68	11 7 31.13	− 0.07
	5	δ Crateris	F.	9.6	12.2	13.7	20.0	22.3	24.2	30.6	32.2	34.8	13 22.18	− 0.98	−12.63	−12.68	11 13 8.52	− 0.07
	6	Anonymous	F.	. .	. .	40.0	42.2	44.9	47.3	49.9	. .	. .	20 44.86	− 1.41	. .	−12.67	11 20 30.78	− 2.69
	7	Lacaille 4852	F.	11.0	14.7	16.4	22.2	27.8	33.8	39.2	40.8	44.9	35 27.87	− 1.57	. .	−12.67	11 35 13.63	− 2.53
	8	β Leonis	F.	44.7	47.2	49.0	55.3	57.4	59.5	5.8	7.4	10.0	42 57.37	− 0.50	−12.70	−12.68	11 42 42.19	0.00
	9	η Virginis	F.	34.7	37.3	38.8	44.9	46.9	48.9	55.2	56.6	59.2	13 46.94	− 0.75	−12.65	−12.68	12 13 33.51	− 0.05
	10	β Corvi	F.	52.5	55.5	57.0	3.6	5.8	8.0	14.7	16.3	19.0	28 5.82	− 1.13	−12.68	−12.68	12 27 52.01	− 0.04
	11	Weisse 498	F.	11.2	13.7	15.3	21.3	23.3	25.4	31.7	33.0	35.8	31 23.41	− 0.80	. .	−12.66	12 31 9.95	− 2.76
	12	12 Canum Venat.	F.	10.4	13.6	15.6	23.5	26.2	28.8	36.6	38.5	42.0	50 26.13	− 0.01	−12.64	−12.68	12 50 13.44	− 0.04
	13	Polaris, S. P.	F.	. .	. .	58.0	32.0	6.0	38.0	10.0	. .	. .	14 4.80	−40.56	. .	−12.67	1 13 11.57	− 2.47
	14	Moon II	F.	37.6	40.3	42.0	48.8	50.9	52.9	59.6	1.4	4.2	49 50.86	− 1.09	. .	−12.63	14 49 37.14	−65.04
	15	β Bootis	F.	11.9	15.4	17.4	25.5	28.2	30.9	39.0	41.1	44.5	57 28.21	+ 0.04	. .	−12.67	14 57 15.58	+ 0.05
	16	β Libræ	F.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	17	μ^1 Bootis	F.	44.3	47.7	49.5	57.4	59.9	2.5	10.3	12.3	15.4	19 59.92	− 0.04	−12.57	−12.67	15 19 47.21	− 0.11
	18	α Coronæ Borealis	F.	24.0	27.0	28.6	35.5	37.9	40.2	47.0	48.8	51.7	29 37.86	− 0.28	−12.41	−12.67	15 29 24.91	− 0.26
	19	α Serpentis	F.	9.1	11.9	13.3	19.5	21.7	23.6	29.8	31.4	33.9	38 21.58	− 0.64	−12.47	−12.67	15 38 8.27	− 0.18
23	20	Sun I, N.	Sk.	27.0	29.7	31.5	38.3	40.6	43.0	49.7	51.3	54.0	5 40.57	− 0.83	. .	−12.53	18 5 27.21	. .
	21	Sun II, S.	Sk.	49.6	52.5	54.2	0.5	2.9	5.1	12.0	13.6	16.4	8 2.98	− 0.83	. .	−12.53	18 7 49.62	. .
	22	γ Aquilæ	Sk.	21.0	23.5	25.2	31.3	33.3	35.4	41.7	43.3	45.8	40 33.39	− 0.43	−12.51	−12.42	19 40 20.54	+ 0.12
	23	α Aquilæ	Sk.	43.2	45.7	47.2	51.3	53.4	55.6	. .	. .	. .	44 55.52	− 0.45	−12.49	−12.42	19 44 42.65	+ 0.11
	24	Venus I, N.	Sk.	31.3	34.0	35.7	42.5	44.6	46.8	53.6	55.2	58.1	45 44.64	− 0.82	. .	−12.50	19 45 31.32	+ 0.40
	25	Venus S.	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	26	α Andromedæ	Sk.	57.0	59.8	1.6	8.6	10.9	13.1	20.2	21.9	24.7	2 10.87	− 0.25	−12.25	−12.38	0 1 58.24	− 0.11
	27	γ Pegasi	Sk.	51.0	53.5	55.2	1.5	3.6	5.7	12.0	13.7	16.3	7 3.61	− 0.43	−12.34	−12.38	0 6 50.80	− 0.04
	28	α Cassiopeæ (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	29	α Cassiopeæ	Sk.	. .	. .	. .	. .	. .	. .	54.8	57.4	1.9	33 40.10	+ 0.37	. .	−12.37	0 33 28.10	− 0.08
	30	Polaris	Sk.	15.0	5.5	10.5	3.0	29.0	55.5	23.5	. .	. .	12 56.99	+28.81	. .	−12.37	1 13 13.43	− 0.25
	31	B. A. C. 421	Sk.	44.3	47.3	49.0	56.3	58.6	1.0	8.3	10.0	13.0	17 58.64	− 0.96	. .	−12.39	1 17 45.29	− 3.50
	32	ο Piscium (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	33	ο Piscium	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	34	β Arietis	Sk.	47.4	50.2	51.9	58.3	0.6	2.7	9.3	10.9	13.6	48 0.54	− 0.36	−12.33	−12.36	1 47 47.82	− 0.01
	35	Neptune	Sk.	31.1	33.9	35.5	41.7	43.7	45.7	51.9	53.6	56.0	55 43.68	− 0.49	. .	−12.38	1 55 30.81	. .
	36	α Arietis	Sk.	11.0	13.7	15.3	21.9	24.2	26.5	33.1	34.6	37.5	0 24.20	− 0.33	−12.34	−12.36	2 0 11.51	− 0.01
	37	ι Cassiopeæ (R.)	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	38	ι Cassiopeæ	Sk.	. .	. .	54.0	59.3	4.5	9.5	14.9	. .	. .	19 4.44	+ 0.96	. .	−12.36	2 18 53.04	+ 0.25
	39	γ Ceti	Sk.	54.0	56.7	58.0	. .	. .	. .	. .	. .	. .	37 6.23	− 0.56	−12.39	−12.35	2 36 53.32	+ 0.04
	40	α Ceti	Sk.	49.3	51.9	53.5	59.5	1.6	3.7	9.8	11.3	13.9	56 1.61	− 0.55	−12.37	−12.35	2 55 48.71	+ 0.04
26	41	η Herculis	Sk.	. .	36.4	38.3	43.6	48.7	51.4	54.2	. .	. .	38 48.84	+ 0.04	−11.64	−11.55	16 38 37.33	+ 0.10
	42	α Ophiuchi	Sk.	8.4	11.0	12.6	18.8	21.0	23.0	29.3	31.0	33.5	29 20.96	+ 0.04	−11.69	−11.54	17 29 9.46	+ 0.18
	43	μ Herculis	Sk.	32.5	35.4	37.0	44.0	46.3	48.6	55.6	57.3	0.2	41 46.32	+ 0.04	−11.56	−11.54	17 41 34.82	+ 0.02
27	44	Sun I, N.	Sk.	11.5	14.4	16.0	22.8	25.0	27.2	34.0	35.7	38.5	23 25.01	+ 0.04	. .	−11.58	18 23 13.47	. .
	45	Sun II, S	Sk.	34.2	36.9	38.4	45.2	47.5	49.8	56.4	58.0	0.8	25 47.47	+ 0.04	. .	−11.58	18 25 35.93	. .
	46	δ Aquilæ	Sk.	12.7	15.3	16.7	22.8	24.9	26.8	33.0	34.6	37.2	19 24.89	+ 0.04	−11.59	−11.53	19 19 13.40	+ 0.11
	47	γ Aquilæ	Sk.	19.4	22.0	23.6	29.9	32.0	34.0	40.3	41.8	44.3	40 31.92	+ 0.04	−11.50	−11.52	19 40 20.44	+ 0.01
	48	α Aquilæ	Sk.	41.6	44.3	45.9	52.0	54.0	56.1	2.3	4.0	6.5	44 54.08	+ 0.04	−11.52	−11.52	19 44 42.60	+ 0.04
	49	Venus I, N.	Sk.	43.9	46.6	48.4	55.0	57.2	59.4	5.9	7.7	10.7	6 57.20	+ 0.04	. .	−11.51	20 6 45.73	+ 0.41
	50	Venus S.	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .

1. Bisections at wires II and III.
2. Telescope micrometer revolutions not observed; reduced for 29.
5, 33. Wire B used.
7. Wire A used.
30, 33. Bisections at sets B and D.
49. Sun shining on barometer.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	35 54	9 29.7	25.5	3.0	26.5	34	118	102	. .	. .	. .	32.7	35 58 6.7	. .	+ 42.7	87 5 10.6	−14.5
2	2 58	10 2.5	1.2	8.0	1.8	.	. .	. .	. .	822	760	32.7	3 3 6.6	. .	+ 3.1	54 9 30.9	−24.2
3	29 32	6.3	2.2	10.0	3.2	35	. .	490	. .	350	. .	32.7	29 35 39.2	42.5	+ 33.4	80 42 33.8	−17.5
4	17 36	2.4	29.6	7.7	29.5	29	. .	. .	. .	320	270	32.7	17 41 15.1	43.8	+ 18.7	68 47 55.0	+ 1.4
5	52 56	8.0	1.4	8.4	1.7	29	340	286	. .	. .	. .	32.7	52 58 40.4	. .	+ 1 17.8	104 6 19.4	− 0.4
6	74 58	3.7	28.9	5.0	2.2	34	. .	. .	. .	396	396	32.7	75 1 56.2	. .	+ 3 36.8	126 11 54.2	− 5.7
7	81 2	8.8	3.0	9.0	5.7	21	. .	. .	. .	006	970	32.7	81 11 49.3	. .	+ 6 3.4	132 24 13.9	− 4.6
8	23 32	0.4	28.9	6.4	1.1	28	. .	. .	. .	994	994	32.7	23 37 20.2	42.5	+ 25.8	74 44 7.2	− 1.0
9	38 48	8.5	3.3	9.8	2.5	36	. .	000	. .	896	. .	32.7	38 51 30.5	. .	+ 47.4	89 58 39.1	+ 0.8
10	61 30	9.4	4.5	11.4	5.1	32	. .	624	. .	494	. .	32.7	61 34 20.7	. .	+ 1 48.4	112 42 30.3	+ 0.8
11	41 40	2.6	28.2	6.0	0.3	26	. .	620	. .	590	. .	32.7	41 45 57.8	. .	+ 52.6	92 53 11.6	−19.3
12	359 50	6.8	5.8	12.2	5.2	31	. .	840	. .	676	. .	32.7	359 54 33.4	. .	− 0.1	51 0 54.5	− 0.5
13	307 30	7.3	3.8	9.2	5.5	33	. .	360	350	384	344	32.7	307 34 9.5	42.2	− 1 16.4	358 39 14.3	+ 0.1
14	59 17	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
15	357 56	2.0	0.5	7.1	0.4	30	. .	088	. .	886	. .	32.7	358 1 5.6	. .	− 2.0	49 7 24.8	− 0.3
16	47 44	9 22.9	18.8	27.3	21.2	34	. .	666	. .	640	. .	32.7	47 48 3.7	. .	+ 1 4.7	98 55 29.6	+ 0.8
17	1 0	10 3.7	0.8	9.1	1.7	29	. .	. .	. .	844	820	32.7	1 5 5.5	44.8	+ 1.1	52 11 27.8	+ 0.8
18	11 42	9.0	9.3	17.3	8.9	35	. .	047	. .	973	. .	32.7	11 45 39.9	. .	+ 12.2	62 52 13.3	+ 1.4
19	32 0	7.0	5.7	11.3	3.5	33	. .	390	. .	238	. .	32.7	32 4 10.0	. .	+ 36.7	83 11 7.9	+ 2.3
20	62 0	7.2	3.5	10.6	4.5	39	198	268	. .	. .	. .	32.6	62 2 40.6	60.2	+ 1 46.5	113 10 48.3	. .
21	62 32	7.3	2.2	9.3	3.9	37	. .	. .	. .	000	028	32.6	62 35 13.0	. .	+ 1 49.0	113 43 23.2	. .
22	28 30	8.5	6.5	19.0	8.5	31	760	712	. .	. .	. .	32.6	28 34 31.6	. .	+ 30.4	79 41 23.2	+ 1.9
23	30 16	10.0	7.8	12.3	6.2	31	028	992	. .	. .	. .	32.6	30 20 44.3	. .	+ 32.7	81 27 38.2	+ 3.8
24	61 36	9.0	5.3	12.3	5.4	36	. .	. .	. .	789	. .	32.6	61 39 14.7	. .	+ 1 43.0	112 47 18.9	. .
25	61 36	9.0	5.3	12.3	5.4	37	. .	. .	. .	. .	580	32.6	61 39 2.0	68.6	+ 1 43.0	112 47 6.2	. .
26	10 26	8.5	9.0	13.5	6.2	37	. .	840	. .	670	. .	33.0	10 29 0.1	. .	+ 10.5	61 35 31.8	+ 2.1
27	24 20	11.1	9.2	13.5	9.3	35	. .	772	. .	580	. .	33.0	24 23 30.3	62.5	+ 25.7	75 30 17.2	+ 1.1
28	196 54	15.0	9.2	15.6	5.6	34	526	502	. .	. .	. .	33.0	196 57 47.9	. .	+ 17.3	34 8 16.0	− 2.0
29	342 58	8.6	7.9	12.1	4.7	32	. .	. .	. .	732	720	33.0	343 2 17.4	. .	− 17.3	34 8 21.3	+ 3.3
30	310 12	11.5	10.5	14.0	8.6	35	765	630	. .	. .	. .	33.0	310 15 32.2	. .	− 1 7.1	1 20 46.3	+ 0.6
31	70 22	6.8	3.6	12.0	3.4	31	. .	282	. .	202	. .	33.0	70 26 42.3	. .	+ 2 38.8	121 35 42.3	+10.5
32	149 34	8.3	7.7	12.0	6.0	30	240	216	. .	. .	. .	33.0	149 38 57.1	. .	− 33.4	81 27 57.5	+ 1.4
33	30 18	7.1	5.5	11.4	4.0	27	. .	. .	. .	735	719	33.0	30 21 0.6	. .	+ 33.4	81 27 55.2	− 0.9
34	18 38	8.0	8.5	13.3	5.1	37	. .	242	. .	106	. .	33.0	18 41 9.5	60.2	+ 19.3	69 47 50.0	+ 4.1
35	28 54	9.0	7.4	12.5	5.1	35	. .	270	. .	132	. .	33.0	28 57 39.9	. .	+ 31.6	80 4 32.7	. .
36	15 58	10.0	8.8	14.3	6.2	38	. .	904	. .	748	. .	33.0	16 0 43.1	. .	+ 16.4	67 7 20.7	+ 2.2
37	207 52	10.9	9.0	14.0	5.0	30	564	600	. .	. .	. .	33.0	207 56 49.3	. .	+ 30.3	23 9 1.6	− 3.9
38	332 0	11.0	8.8	12.9	7.4	36	. .	. .	. .	654	650	33.0	332 3 16.0	. .	− 30.3	23 9 6.9	+ 1.4
39	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
40	35 12	6.7	4.0	9.5	0.7	31	. .	086	. .	970	. .	33.0	35 16 47.0	59.0	+ 40.4	86 23 48.6	+ 1.9
41	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	. .	. . . .	. .	. .	. . . .	. .
42	26 10	10.6	14.5	18.8	11.3	32	908	848	. .	. .	. .	36.4	26 14 14.8	. .	+ 29.3	77 21 5.3	+ 2.7
43	11 2	4.2	7.2	14.0	3.0	34	280	. .	. .	. .	062	36.4	11 6 0.8	43.6	+ 11.7	62 12 33.7	+ 4.2
44	61 52	11.2	10.3	17.1	8.9	33	880	840	. .	. .	. .	36.4	61 56 1.2	. .	+ 1 51.1	113 4 13.5	. .
45	62 24	7.2	6.0	13.7	6.6	31	. .	. .	. .	772	798	36.4	62 28 34.2	44.0	+ 1 53.7	113 36 49.1	. .
46	35 56	4.7	5.5	13.0	5.1	30	550	. .	. .	. .	300	36.4	36 0 57.8	. .	+ 43.2	87 8 2.2	+ 3.2
47	28 30	9.0	10.2	17.1	9.0	32	050	. .	. .	. .	858	36.4	28 34 30.2	. .	+ 32.4	79 41 23.8	+ 1.9
48	30 16	7.2	9.5	14.2	3.8	31	430	. .	. .	. .	230	36.4	30 20 42.4	. .	+ 34.8	81 27 38.4	+ 3.4
49	60 42	8.4	9.8	17.3	8.4	37	. .	618	. .	534	. .	36.4	60 45 4.2	44.0	+ 1 45.9	111 53 11.3	. .
50	60 42	8.4	9.8	17.3	8.4	36	718	. .	. .	. .	718	36.4	60 45 17.2	. .	+ 1 45.9	111 53 24.3	. .

No.	Barom.	At. Ther.
	in.	°
3	29.87	45.5
4	29.87	46.8
8	29.85	45.5
13	29.85	45.0
17	29.88	46.7
20	29.82	55.8
25	29.83	69.5
27	29.92	61.0
34	29.95	58.8
40	29.98	58.8
43	30.23	45.0
45	30.24	45.6
49	30.28	55.0

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
20	− 7.9	+ 16 17.4	. .	+ 16 9.5
21	− 8.0	− 16 17.4	. .	− 16 25.4
24	− 5.1	− 6.3	. .	− 11.4
25	− 5.1	+ 6.4	. .	+ 1.3
35	− 0.1	. .	. .	− 0.1
44	− 8.0	+ 16 17.8	. .	+ 16 9.8
45	− 8.0	− 16 17.8	. .	− 16 25.8
49	− 5.1	+ 6.5	. .	+ 1.4
50	− 5.1	− 6.5	. .	− 11.6

DATE.	Number.	OBJECT.	Observer.	SECONDS OF TRANSIT OVER WIRES.										CORRECTIONS.			Apparent Right Ascension.	Miscellan'us Corrections.
				I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	Mean wire.	Inst.	Clock appar'nt.	Clock adopted.		
1875.													m. s.	s.	s.	s.	h. m. s.	s.
Dec. 27	1	α Andromedæ . .	Sk.	55.7	58.6	0.3	7.3	9.7	12.0	18.9	20.7	23.6	2 9.64	+ 0.05	−11.37	−11.48	0 1 58.21	− 0.09
	2	γ Pegasi	Sk.	49.5	52.2	53.8	0.0	2.1	4.2	10.6	12.0	14.8	7 2.13	+ 0.04	−11.37	−11.48	0 6 50.69	− 0.11
	3	α Cassiopeæ (R.) .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	4	α Cassiopeæ . . .	Sk.	. .	. .	31.8	35.6	39.4	43.0	46.7	. .	. .	33 39.30	+ 0.06	. .	−11.47	0 33 27.89	− 0.18
	5	Polaris	Sk.	37.5	28.5	35.0	28.0	51.5	22.5	48.0	. .	. .	13 21.14	+ 0.64	. .	−11.47	1 13 10.31	− 0.30
	6	B. A. C. 415 . .	Sk.	0.6	3.9	5.8	10.9	13.5	16.0	18.6	. .	. .	17 16.03	+ 0.01	. .	−11.39	1 17 4.65	− 3.48
	7	B. A. C. 421 . .	Sk.	. .	. .	52.0	54.3	56.8	59.1	1.5	. .	. .	17 56.74	+ 0.02	. .	−11.39	1 17 45.37	− 3.44
	8	Neptune . . .	Sk.	21.3	23.9	25.6	31.6	33.8	35.8	42.1	43.7	46.2	55 33.78	+ 0.04	. .	−11.39	1 55 22.53	. .
	9	α Arietis	Sk.	9.6	12.4	14.1	20.6	22.8	25.0	31.8	33.4	36.2	0 22.88	+ 0.04	−11.43	−11.46	2 0 11.46	− 0.02
	10	ι Cassiopeæ (R.) .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	11	ι Cassiopeæ . . .	Sk.	. .	. .	54.0	59.0	4.5	9.5	14.9	. .	. .	19 4.38	+ 0.08	. .	−11.46	2 18 53.00	+ 0.33
	12	Lalande 4803 . .	Sk.	16.6	19.4	20.8	26.9	28.9	31.0	37.3	38.8	41.3	29 29.00	+ 0.04	. .	−11.39	2 29 17.65	− 3.75
	13	γ Ceti	Sk.	52.5	55.0	56.5	2.7	4.7	6.7	12.8	14.4	16.8	37 4.68	+ 0.04	−11.47	−11.45	2 36 53.27	+ 0.02
	14	B. A. C. 879 . .	Sk.	52.0	55.0	56.9	4.3	6.7	9.1	16.3	18.2	21.2	44 6.63	+ 0.02	. .	−11.39	2 43 55.26	− 3.66
	15	Weisse 794 . .	Sk.	14.4	16.8	18.4	24.5	26.4	28.6	34.8	36.3	38.7	47 26.54	+ 0.04	. .	−11.39	2 47 15.19	− 3.84
	16	B. A. C. 930 . .	Sk.	39.6	42.8	44.8	52.7	55.4	57.8	5.7	7.7	11.0	52 55.28	+ 0.01	. .	−11.39	2 52 43.90	− 3.68
	17	α Ceti	Sk.	47.8	50.4	52.0	56.0	0.1	4.2	8.3	9.8	12.3	56 0.10	+ 0.04	−11.46	−11.45	2 55 48.69	+ 0.03
	18	B. A. C. 1009 . .	Sk.	6.2	9.5	11.5	16.7	19.3	22.0	24.6	27.3	. .	9 22.01	+ 0.01	. .	−11.38	3 9 10.64	− 3.70
	19	B. A. C. 1015 . .	Sk.	. .	. .	. .	. .	2.7	5.3	10.5	12.0	15.6	10 0.27	+ 0.02	. .	−11.38	3 9 48.91	− 3.70
	20	B. A. C. 1194 . .	Sk.	54.0	57.3	58.9	6.4	8.4	10.7	17.7	19.6	22.4	43 8.33	+ 0.02	. .	−11.38	3 42 56.97	− 3.76
	21	γ Tauri (R.) . . .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	22	γ Tauri	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	23	B. A. C. 1389 . .	Sk.	23.6	27.0	28.9	37.0	39.9	42.6	50.9	52.6	56.2	22 39.86	+ 0.01	. .	−11.38	4 22 28.49	− 3.73
	24	B. A. C. 1843 . .	Sk.	52.9	55.9	57.0	3.3	5.2	7.2	13.6	15.0	17.7	42 5.27	+ 0.03	. .	−11.38	5 41 53.92	− 4.14
	25	B. A. C. 1862 . .	Sk.	. .	. .	28.0	30.2	32.3	34.4	36.6	. .	. .	45 32.30	+ 0.04	. .	−11.38	5 45 20.96	− 4.70
	26	B. A. C. 1891 . .	Sk.	35.0	37.9	40.0	47.3	49.8	52.3	59.6	1.4	4.6	48 49.77	+ 0.02	. .	−11.38	5 48 38.41	− 3.76
	27	B. A. C. 1904 . .	Sk.	47.5	50.8	52.9	0.8	3.4	6.2	14.0	16.0	19.4	51 3.44	+ 0.01	. .	−11.38	5 50 52.07	− 3.68
	28	B. A. C. 2051 . .	Sk.	31.9	35.0	36.7	43.6	46.0	48.3	55.3	57.2	0.2	15 46.02	+ 0.02	. .	−11.38	6 15 34.66	− 3.79
	29	γ Geminorum (R.) .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	30	γ Geminorum . .	Sk.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. . .	. .	. .	. .	. . . .	. .
	31	B. A. C. 2309 . .	Sk.	45.5	48.6	50.0	57.3	59.5	1.6	8.6	10.4	13.1	56 59.40	+ 0.02	. .	−11.38	6 56 48.04	− 3.78
	32	47 Geminorum . .	Sk.	. .	. .	49.8	52.0	54.4	56.6	59.0	. .	. .	3 54.36	+ 0.05	. .	−11.38	7 3 43.03	− 5.22
	33	B. A. C. 2355 . .	Sk.	. .	. .	. .	. .	56.8	59.3	4.6	6.7	10.0	4 54.10	+ 0.01	. .	−11.38	7 4 42.73	− 3.57
	34	B. A. C. 2422 . .	Sk.	. .	. .	1.4	4.0	6.6	9.2	11.8	. .	. .	14 6.60	+ 0.02	. .	−11.38	7 13 55.24	− 3.60
	35	B. A. C. 2425 . .	Sk.	. .	. .	21.4	24.0	26.3	28.9	31.6	. .	. .	14 26.44	+ 0.02	. .	−11.38	7 14 15.08	− 3.60
	36	B. A. C. 2469 . .	Sk.	4.8	7.6	9.3	16.3	18.6	20.8	27.9	29.5	32.4	22 18.58	+ 0.05	. .	−11.38	7 22 7.25	− 5.25
	37	α Canis Minoris .	Sk.	48.9	51.4	53.0	59.0	1.0	3.2	9.4	11.0	13.6	33 1.17	+ 0.04	−11.42	−11.41	7 32 49.80	− 0.15
	38	β Geminorum . .	Sk.	42.5	45.4	47.2	54.0	56.3	58.5	5.5	7.3	10.4	37 56.34	+ 0.05	−11.33	−11.41	7 37 44.98	− 0.11
	39	B. A. C. 2605 . .	Sk.	46.4	48.0	52.4	54.5	56.6	58.7	1.0	5.3	6.9	44 56.62	+ 0.04	. .	−11.37	7 44 45.29	− 4.86

5, 11. Bisections at sets B and D.
18. Telescope micrometer revolutions not observed; reduced for 36.
25. Bisections at wires II and V.
30. Both bisections near wire VII.
30, 32. Wire A used.

Number.	Circle Division.	MICROSCOPE MICROMS.				TELESCOPE MICROMETER.						Zenith-Point Correction.	Apparent Zenith Distance, South.	External Thermom'r.	Refraction.	Apparent North-Polar Distance.	Miscellan'us Corrections.
		I.	II.	III.	IV.	Rev.	1.	2.	3.	4.	5.						
	° ′	r. ″	″	″	″							″	° ′ ″	°	′ ″	° ′ ″	″
1	10 26	10 10.5	10.4	16.4	8.0	38	. .	040	. .	870	. .	37.1	10 28 59.1	40.8	+ 11.1	61 35 31.4	+ 1.4
2	24 20	9.5	7.7	14.8	4.6	36	. .	142	. .	062	. .	37.1	24 23 29.5	. .	+ 27.3	75 30 18.0	+ 1.6
3	196 54	11.0	11.0	17.4	6.7	34	840	790	. .	. .	. .	37.1	196 57 47.2	. .	+ 18.4	34 8 15.6	− 2.4
4	342 58	12.5	11.5	17.4	9.2	32	. .	. .	. .	760	750	37.1	343 2 17.8	. .	− 18.4	34 8 20.6	+ 2.6
5	310 12	12.5	10.6	17.2	11.5	35	646	480	. .	. .	. .	37.1	310 15 36.7	. .	− 1 11.2	1 20 46.7	+ 1.7
6	76 0	9.8	6.5	12.3	5.1	32	338	210	. .	. .	. .	37.1	76 4 29.6	. .	+ 3 59.4	127 14 50.2	+ 8.6
7	70 22	12.0	10.5	16.1	9.2	31	. .	. .	. .	742	776	37.1	70 26 31.6	. .	+ 2 48.7	121 35 41.5	+10.2
8	28 54	10.0	10.5	16.4	7.0	33	390	400	. .	. .	. .	37.1	28 58 10.4	. .	+ 33.6	80 5 5.2	. .
9	15 58	5.1	6.8	13.1	3.7	39	. .	400	. .	254	. .	37.1	16 0 42.1	. .	+ 17.4	67 7 20.7	+ 2.2
10	207 52	9.5	11.3	16.7	6.2	30	912	912	. .	. .	. .	37.1	207 56 47.1	. .	+ 32.2	23 9 1.9	+ 2.9
11	332 0	10.6	10.1	16.0	9.2	36	. .	. .	. .	800	820	37.1	332 3 16.0	. .	− 32.2	23 9 5.0	+ 0.2
12	32 32	10.6	9.8	15.3	7.8	36	960	960	. .	. .	. .	37.1	32 35 15.8	35.5	+ 38.9	83 42 15.9	+21.8
13	36 6	8.2	7.0	12.2	3.5	33	960	918	. .	. .	. .	37.1	36 10 5.2	. .	+ 44.4	87 17 10.8	− 0.1
14	71 42	8.5	8.4	14.8	6.5	32	870	808	. .	. .	. .	37.1	71 46 19.9	. .	+ 3 2.9	122 55 44.0	+10.6
15	34 12	8.9	8.4	13.9	6.8	31	206	172	. .	. .	. .	37.1	34 16 45.6	. .	+ 41.5	85 23 48.3	+20.8
16	77 26	6.7	4.8	10.2	4.4	31	758	708	. .	. .	. .	37.1	77 30 39.8	. .	+ 4 28.8	128 41 29.8	+ 9.4
17	35 12	9.2	8.3	14.5	4.6	31	367	312	. .	. .	. .	37.1	35 16 43.6	. .	+ 43.0	86 23 47.8	+ 0.8
18	78 2	10.2	9.0	13.8	6.8	.	710	680	. .	. .	. .	37.1	78 5 20.3	. .	+ 4 41.9	129 16 23.4	+ 9.3
19	74 48	8.7	6.7	11.8	5.2	36	. .	. .	. .	972	940	37.1	74 51 15.8	. .	+ 3 41.7	126 1 18.7	+ 9.9
20	69 20	10.0	8.4	14.3	7.6	36	060	940	. .	. .	. .	37.1	69 23 31.0	. .	+ 2 40.8	120 32 33.0	+10.7
21	156 22	8.5	11.4	15.0	8.0	31	990	040	. .	. .	. .	37.1	156 26 31.5	. .	− 26.7	74 40 16.4	+ 2.0
22	23 30	10.5	10.7	18.2	8.7	36	. .	. .	. .	000	990	37.1	23 33 27.1	. .	+ 26.7	74 40 15.0	+ 0.6
23	79 34	8.8	7.0	12.5	5.3	38	. .	718	. .	640	. .	37.1	79 36 50.4	. .	+ 5 23.0	130 48 34.6	+ 8.6
24	48 32	10.0	8.5	14.5	6.7	36	972	840	. .	. .	. .	37.1	48 35 17.5	. .	+ 1 9.2	99 42 47.9	+ 9.6
25	24 40	7.0	6.8	13.5	5.8	31	. .	338	. .	. .	230	37.1	24 44 44.4	. .	+ 28.2	75 51 33.8	+ 8.8
26	72 36	8.6	6.5	12.4	6.0	33	785	720	. .	. .	. .	37.1	72 40 7.0	. .	+ 3 13.7	123 49 41.9	+ 7.1
27	78 44	6.2	4.1	9.4	3.2	36	. .	988	. .	780	. .	37.1	78 47 20.6	. .	+ 5 0.4	129 58 42.2	+ 6.9
28	68 48	7.6	5.6	12.7	4.9	36	360	410	. .	. .	. .	37.1	68 51 27.5	. .	+ 2 37.1	120 0 25.8	+ 6.2
29	157 34	8.5	7.5	13.0	7.1	37	896	930	. .	. .	. .	37.1	157 37 2.9	. .	− 25.2	73 29 43.5	+ 3.5
30	22 18	7.3	6.5	14.0	4.0	40	. .	. .	. .	520	568	37.1	22 22 53.4	32.6	+ 25.2	73 29 39.8	− 0.2
31	66 34	6.5	4.8	11.2	3.1	39	700	730	. .	. .	. .	37.1	66 36 37.8	. .	+ 2 20.7	117 45 19.7	+ 4.2
32	11 44	6.6	6.8	15.0	4.9	37	035	. .	. .	. .	. .	37.1	11 49 50.1	. .	+ 12.8	62 56 24.1	+ 0.5
33	78 12	8.5	7.0	13.6	7.8	33	. .	. .	. .	640	585	37.1	78 16 5.8	. .	+ 4 47.7	129 27 14.7	+ 4.5
34	75 16	6.1	4.0	9.4	4.4	33	746	711	. .	. .	. .	37.1	75 20 9.8	. .	+ 3 50.4	126 30 21.4	+ 3.9
35	75 16	6.1	4.0	9.4	4.4	31	. .	. .	. .	693	690	37.1	75 20 38.5	. .	+ 3 50.5	126 30 50.2	+ 3.9
36	10 40	7.4	8.6	16.0	7.4	37	400	330	. .	. .	. .	37.1	10 43 10.9	. .	+ 11.6	61 49 43.7	− 2.1
37	. .	. .	. .	. .	. .	.	. .	. .	. .	. .	. .	.	. . . .	. .	. .	. . . .	. .
38	10 30	7.5	8.2	14.7	7.0	34	. .	368	. .	248	. .	37.1	10 33 56.9	. .	+ 11.4	61 40 29.5	+ 0.3
39	19 10	9.0	8.7	16.5	7.9	30	. .	. .	. .	933	970	37.1	19 14 45.9	31.9	+ 21.4	70 21 28.5	− 4.2

No.	Barom.	At Ther.
	in.	°
1	30.35	42.7
12	30.39	38.7
30	30.39	35.8
39	30.39	34.9

For summary of the elements of reduction see page 3.

No.	Parallax.	Semi-diam.	Defective Illumination.	Sum.
	′ ″	′ ″	′ ″	′ ″
8	− 0.1	. .	. .	− 0.1

OBSERVATIONS

WITH THE

MERIDIAN TRANSIT INSTRUMENT.

1875.

OBSERVATIONS

WITH THE

MERIDIAN TRANSIT INSTRUMENT.

Date and Observer.	OBJECT.	Number.	SECONDS OF TRANSIT.												CORRECTIONS.		Observed R. Ascension.	Reduct'n to 1875.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
														m. s.	s.	s.	h. m. s.	s.
1875. Oct. 5 Y.	ζ Aquilæ. . . .	1	55.8	57.1	59.9	. .	. .	. .	. .	. .	30.9	33.5	35.1	0 15.38	− 0.16	−33.53	18 59 41.69	− 1.93
	d Sagittarii . . .	2	. .	. .	. .	. .	. .	. .	27.2	29.9	31.7	33.5	35.6	11 31.58	− 36.08	−33.52	19 10 21.98	− 2.63
	δ Aquilæ. . . .	3	28.5	30.0	32 3	44.3	45.8	47.5	49.2	50.7	2.7	5.1	6.9	19 47.55	− 0.06	−33.51	19 19 13.98	− 2.26
	B. A. C. 6711 . .	4	. .	. .	. .	46.2	48.2	50.3	52.4	54.4	. .	. .	. .	29 50.30	− 0.40	−33.50	19 29 16.40	− 1.52
	O. Arg. S. 19941 .	5	35.6	37.2	40.1	53.4	55.0	57.1	58.8	0.4	13.9	16.8	18.6	39 56.99	+ 0.18	−33.49	19 39 23.68	− 3.00
	β Aquilæ. . . .	6	27.0	28.6	31.0	42.8	. .	46.3	. .	49.4	1.3	3.9	5.5	49 46.20	− 0.09	−33.48	19 49 12.63	− 2.35
	Weisse (2) 175. .	7	57.0	58.8	1.5	17.5	19.2	21.0	22.9	24.7	40.5	44.1	46.3	54 21.23	− 0.42	−33.47	19 53 47.34	− 1.66
	*+33° 7′ . . .	8	57.8	59.6	2.2	16.8	18.6	20.6	22.6	24.5	38.6	41.5	43.7	1 20.59	− 0.34	−33.46	20 0 46.79	− 1.85
	*+33° 7′ . . .	9	8.3	10.2	13.0	27.3	29.1	31.2	33.0	34.9	49.3	52.2	54.2	2 31.15	− 0.34	−33.46	20 1 57.35	− 1.86
	*+33° 4′ . . .	10	34 4	36 2	38.9	53.3	55.0	57.2	58.1	0.9	15.0	18.1	20.1	3 57.02	− 0.34	−33.46	20 3 23.22	− 1.87
	*+36° 21′ . . .	11	42.4	44.3	47.3	2.3	4.1	6.1	8.2	10.1	24.9	28.0	30.1	9 6.16	− 0.38	−33.45	20 8 32.33	− 1.82
	b³ Cygni	12	. .	. .	. .	22.5	24.5	26.6	28.5	30.5	. .	. .	. .	10 26.52	− 0.37	−33.45	20 9 52.70	− 1.83
	B. A. C. 6969 . .	13	47.5	50.0	52.2	54.0	57.2	. .	11.9	15.1	17.1	19.2	21.6	10 34.58	− 0.47	−33.45	20 10 0.66	− 1.83
	*+36° 44′ . . .	14	. .	. .	. .	33.0	34.7	36.9	39.0	40.9	. .	. .	. .	15 36.90	− 0.38	−33.44	20 15 3.08	− 1.85
	B. A. C. 7006 . .	15	. .	. .	. .	1.8	4.9	7.0	20.6	23.9	25.8	28.0	30.2	16 17 77	− 35.14	−33.44	20 15 9.19	− 1.85
	O. Arg. S. 20533 .	16	0.0	1.6	4.3	17.1	18.8	20.5	22.5	23.8	36.7	39.4	41.2	22 20.54	+ 0.13	−33.44	20 21 47.23	− 3.10
	B. A. C. 7130 . .	17	0.0	1.6	4.0	16.0	17.4	19.3	20.8	22.3	34.2	36.8	38.2	33 19.15	− 0.02	−33.42	20 32 45.71	− 2.74
	52 Cygni	18	43.5	45.4	48.2	2.0	3.8	5.8	7.8	9.5	23.2	26.2	28.0	41 5.76	− 0.31	−33.42	20 40 32.03	− 2.15
	17 Delphini . . .	19	57.9	59.3	1.9	14.2	15.8	17.6	19.1	20.7	33.0	35.5	37.4	50 17.49	− 0.15	−33.41	20 49 43.93	− 2.52
	Radcliffe 5050. .	20	25.1	27.0	30.5	47.0	49.1	51.5	53.8	56.0	12.5	15.9	18.2	54 51.51	− 0.49	−33.40	20 54 17.62	− 1.95
	2 Piscis Australis .	21	59.9	1.9	4.7	19.0	20.6	22.8	24.7	26.5	40.6	43.6	45.7	59 22.73	+ 0.24	−33.40	20 58 49.57	− 3.65
	*−12 15′ . . .	22	16.6	18.2	20.6	32.8	34.5	36.2	37.8	39.4	51.6	54.2	55.9	4 36.16	+ 0.05	−33.39	21 4 2.82	− 3.09
	*−12° 12′ . . .	23	55.0	56.6	59 2	11.2	12.8	14.7	16.0	17.9	30.0	32.6	34.4	6 14.58	+ 0.04	−33.39	21 5 41.23	− 3.10
	B. A. C. 7378 . .	24	50.8	52.4	55.1	7.9	9.4	11.3	12.9	14 5	27.3	30.1	31.7	10 11.22	+ 0.13	−33.39	21 9 37.96	− 3.32
	B. A. C. 7408 . .	25	33.1	34.7	37.2	49.2	50.8	52.5	54.2	55.7	7.7	10.3	12.1	15 52.50	+ 0.04	−33.38	21 15 19.16	− 3.09
	*+38° 6 . . .	26	0.5	2.5	5.4	20.6	22.5	24.8	26.9	28.8	43.8	47.0	49.0	21 24.71	− 0.41	−33.37	21 20 50.93	− 2.26
	β Aquarii. . . .	27	15.8	17.4	19.8	31.8	33.4	35.0	36.7	38.2	50.2	52.7	54.3	25 35.03	0.00	−33.37	21 25 1.66	− 3.05
	ξ Aquarii. . . .	28	23.0	24.4	27.0	39.0	40.6	42.3	43.9	45.3	57.5	0.1	1.6	31 42.25	+ 0.03	−33.36	21 31 8.92	− 3.12
	Weisse (2) 871. .	29	58.5	0.3	3.4	17.7	19.6	21.8	23.6	25.5	39.8	42.9	44.9	36 21.64	− 0.35	−33.36	21 35 47.93	− 2.42
	Weisse (2) 877. .	30	. .	. .	. .	57.6	0.5	2.5	15.8	18.6	20.7	22.7	25.0	37 12.92	− 33.99	−33 36	21 36 5.57	− 2.42
	Weisse 1063 . .	31	. .	. .	. .	36.7	38.2	39.9	41.4	43.2	. .	. .	. .	46 39.88	+ 0.01	−33.35	21 46 6.54	− 3.13
	Lacaille 8989 . .	32	54 1	55.8	58.6	12.3	14.2	16.1	18.0	19.7	33.1	36.1	38.0	54 16.00	+ 0.20	−33.34	21 53 42.86	− 3.74
	23 Pegasi	33	9.0	10.8	13.5	27.2	28.9	30.8	32.6	34.4	48.0	50.9	52.7	0 30.80	− 0.29	−33.33	21 59 57.18	− 2.64
	*+36° 47′ . . .	34	59.1	1.0	4.2	19.0	20.9	23.0	25.0	27.0	41.9	45.0	47.1	4 23.02	− 0.38	−33.33	22 3 49.31	− 2.55
	θ Aquarii. . . .	35	31.4	32.9	35.3	47.5	49.1	50.7	52.4	53.9	5.9	8.5	10.3	10 50.72	+ 0.03	−33.32	22 10 17.43	− 3.27
	B. A. C. 7793 . .	36	8.5	10 0	12.4	24.5	26.0	27.7	29 4	30.9	42.9	45.4	47.0	15 27.70	+ 0.01	−33.31	22 14 54.40	− 3.25
	Weisse 281 . .	37	. .	. .	. .	5.6	8.1	9.8	20.9	23.5	25.0	26 6	28.6	16 18.51	− 28.04	−33.31	22 15 17.16	− 3.25
	π Aquarii. . . .	38	. .	. .	. .	26.6	28.3	30.0	31.7	33.0	45.0	47.5	49.2	19 36.41	− 6.52	−33.31	22 18 56.58	− 3.12
	*−31° 5′ . . .	39	. .	. .	. .	42.6	44.2	46.1	48.0	50.2	. .	. .	. .	23 46.22	+ 0.23	−33.30	22 23 13.15	− 3.90
	B. A. C. 7861 . .	40	48.7	50.2	52.7	4.7	6.4	8.0	9.6	11.3	23.3	26.0	27.6	28 8.05	+ 0.04	−33.30	22 27 34.79	− 3.35
	O. Arg. S. 22282 .	41	2.4	4.0	6.7	19.7	21.2	23.0	24.6	26.5	39.5	42.0	43.9	31 23.05	+ 0.15	−33.30	22 30 49.90	− 3.65
	o Pegasi	42	7.5	9.2	12.1	25.8	27.6	29.4	31.2	33.0	46.6	49.5	51.4	36 29.39	− 0.29	−33.29	22 35 55.81	− 2.83
	λ Aquarii . . .	43	22.9	24.4	26.9	39.0	40.5	42.3	43.8	45.5	57.4	59.9	1.6	46 42.20	+ 0.02	−33.28	22 46 8.94	− 3.35
	B. A. C. 8010 . .	44	5.4	6.8	9.4	21.6	22.9	24.7	26.4	27.9	40.0	42.6	44.3	54 24.73	+ 0.03	−33.27	22 53 51.49	− 3.41
	A Piscium . . .	45	34.1	35.6	38.0	50.0	51.5	53.2	54.9	56.4	8.3	10.8	12.4	2 53.20	− 0.05	−33.26	23 2 19.89	− 3.24
	B. A. C. 8065 . .	46	. .	. .	. .	32.6	34.1	35.9	37.5	39.1	. .	. .	. .	3 35.84	− 0.04	−33.26	23 3 2.54	− 3.24
	*+36° 49′ . . .	47	54.1	56.0	59.0	14.0	15.9	18.1	20.0	21.9	36.8	39.8	41.9	15 17.95	− 0.39	−33.25	23 14 44.31	− 2.98

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1875. h.	s.	s.	s.	s.
Oct. 5, 20.8	− 33.41	+ 0.066	− 0.45	− 0.04

Date and Observer.	OBJECT.	Number.	SECONDS OF TRANSIT.												CORRECTIONS.		Observed R. Ascension.	Reduct'n to 1875.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
1875.														m. s.	s.	s.	h. m. s.	s.
Oct. 7. Y.	α Aquilæ	1	52.6	54.0	56.6	8.7	10.3	12.0	13.6	15.2	27.1	29.6	31.3	45 11.91	− 0.11	−28.47	19 44 43.33	− 2.26
	β Aquilæ	2	22.0	23.6	26.1	38.1	39.5	41.2	42.8	44.4	56.5	59.0	0.5	49 41.25	− 0.09	−28.47	19 49 12.69	− 2.31
	* + 36° 42′	3	26.5	28.5	31.5	46.6	48.4	50.5	52.6	54.6	9.3	12.4	14.6	55 50.50	− 0.39	−28.46	19 55 21.65	− 1.69
	* + 36° 44′	4	46.0	48.1	51.0	6.1	8.1	10.1	12.0	14.0	28.8	31.8	33.9	57 9.99	− 0.39	−28.46	19 56 41.14	− 1.69
	* + 33° 7′	5	3.3	4.9	8.1	22.6	24.2	26.3	28.2	29.9	44.1	47.3	49.3	2 26.20	− 0.34	−28.46	20 1 57.40	− 1.82
	Lalande 38708	6	26.8	28.5	31.7	47.0	49.2	51.3	53.3	55.4	10.7	13.7	15.8	5 51.22	− 0.41	−28.46	20 5 22.34	− 1.70
	B. A. C. 6969	7	5.8	7.9	11.0	25.8	27.7	29.8	31.8	33.6	49.5	52.3	54.5	10 29.97	− 0.38	−28.45	20 10 1.14	− 1.79
	* + 36° 44′	8	56.3	57.9	0.9	15.8	17.5	19.6	21.5	23.7	38.7	41.6	44.0	17 19.77	− 0.39	−28.45	20 16 50.93	− 1.82
	O. Arg. S. 20533	9	55.2	56.6	59.3	12.3	13.8	15.7	17.4	19.0	31.8	34.6	36.4	22 15.65	+ 0.13	−28.44	20 21 47.34	− 3.08
	* − 0° 8′	10	5.9	7.7	10.2	22.3	24.0	25.6	26.8	28.2	40.3	42.5	44.3	27 25.25	− 0.04	−28.44	20 26 56.77	− 2.63
	B. A. C. 7114	11	. .	. .	. .	31.9	34.2	36.4	38.5	40.8	. .	. .	. .	30 36.36	− 0.43	−28.44	20 30 7.39	− 1.81
	52 Cygni	12	48.9	40.6	43.2	57.0	58.7	0.6	2.6	4.4	18.2	21.3	23.0	41 0.68	− 0.31	−28.43	20 40 31.94	− 2.12
	* − 21° 29′	13	. .	. .	. .	44.1	45.8	47.4	49.2	50.8	. .	. .	. .	44 47.42	+ 0.14	−28.43	20 44 19.13	− 3.20
	* + 37° 56′	14	. .	. .	. .	. .	. .	. .	27.2	30.7	32.4	34.7	37.2	48 32.44	− 43.76	−28.42	20 47 20.66	− 2.00
	B. A. C. 7269	15	44.7	46.3	48.7	0.8	2.5	4.1	5.7	7.4	19.1	21.7	23.4	52 4.03	− 0.07	−28.42	20 51 35.54	− 2.68
	Radcliffe 5050	16	. .	. .	. .	7.6	11.0	13.5	28.7	32.1	34.4	36.6	39.2	55 25.39	− 39.16	−28.42	20 54 17.81	− 1.91
	ζ Cygni	17	45.9	47.5	50.5	4.1	5.8	7.9	9.5	11.4	26.2	28.0	29.9	8 7.88	− 0.30	−28.41	21 7 39.17	− 2.28
	B. A. C. 7408	18	28.2	29.7	32.2	44.2	45.7	47.5	49.2	50.9	2.7	5.3	7.0	15 47.51	+ 0.04	−28.40	21 15 19.15	− 3.06
	Lalande 41624	19	. .	. .	. .	37.5	40.8	42.8	56.8	0.1	2.1	4.0	6.4	18 53.81	− 35.78	−28.40	21 17 49.63	− 2.20
	* − 25° 46′	20	. .	. .	. .	41.8	44.5	46.5	58.5	1.1	3.0	5.1	7.0	25 55.94	− 30.75	−28.39	21 24 56.80	− 3.51
	5 Pegasi	21	5.5	6.9	9.5	**22.1**	**23.9**	25.7	27.4	28.8	41.7	44.4	46.1	32 25.64	− 0.19	−28.39	21 31 57.06	− 2.61
	Weisse (2) 871	22	53.8	55.5	58.5	. .	. .	. .	. .	. .	35.4	38.1	40.0	36 16.88	− 0.37	−28.38	21 35 48.13	− 2.39
	23 Pegasi	23	4.3	5.9	8.7	22.5	24.2	26.2	27.9	29.6	43.1	46.0	47.7	0 26.01	− 0.29	−28.37	21 59 57.35	− 2.62
	θ Aquarii	24	26.5	27.9	30.4	42.5	44.1	45.8	47.5	49.0	1.0	3.4	5.1	10 45.75	+ 0.03	−28.36	22 10 17.42	− 3.25
	Weisse 281	25	26.4	27.8	30.4	42.3	44.0	45.7	47.2	48.7	0.7	3.4	5.0	15 45.60	+ 0.01	−28.35	22 15 17.26	− 3.23
	B. A. C. 7861	26	43.6	45.2	47.6	59.9	1.5	3.1	4.7	6.1	18.3	21.0	22.6	28 3.06	+ 0.04	−28.34	22 27 34.76	− 3.34
	O. Arg. S. 22282	27	57.5	59.0	1.9	14.6	16.4	18.1	20.0	21.7	34.5	37.3	39.2	31 18.20	+ 0.14	−28.34	22 30 50.00	− 3.64
	ο Pegasi	28	2.8	4.4	7.3	20.8	22.7	24.9	26.5	28.2	41.9	44.8	46.7	36 24.64	− 0.29	−28.34	22 35 56.01	− 2.81
	* − 33° 31′	29	10.3	12.0	15.0	29.3	31.2	33.2	35.0	36.8	51.2	54.1	56.1	43 33.11	+ 0.25	−28.33	22 43 5.03	− 4.01
	λ Aquarii	30	17.9	19.1	21.8	33.9	35.4	37.1	38.7	40.3	52.4	55.0	56.5	46 37.10	+ 0.03	−28.33	22 46 8.80	− 3.34
	Lalande 44918	31	57.1	59.0	1.9	17.3	19.4	21.5	23.8	24.5	41.0	44.2	46.0	52 21.43	− 0.41	−28.33	22 51 52.69	− 2.82
	A Piscium	32	29.2	30.8	33.2	45.2	46.6	48.3	50.0	51.5	3.4	5.8	7.5	2 48.32	− 0.05	−28.31	23 2 19.96	− 3.24
	B. A C. 8065	33	11.7	13.2	15.8	27.6	29.2	31.0	32.5	34.0	45.9	48.2	50.2	3 30.85	− 0.05	−28.31	23 3 2.49	− 3.24
	O. Arg. S. 22721	34	9.6	11.1	13.8	26.6	28.5	29.9	31.9	33.4	. .	. .	. .	10 23.10	+ 7.12	−28.31	23 10 1.91	− 3.70
	O. Arg. S. 22723	35	. .	. .	. .	40.4	42.2	44.1	45.7	47.5	0.0	3.1	4.8	10 50.98	− 6.83	−28.31	23 10 15.84	− 3.70
	* + 36° 49′	36	. .	. .	. .	9.2	11.0	13.0	15.0	17.0	. .	. .	. .	15 13.04	− 0.38	−28.30	23 14 44.36	− 2.97
	* + 54° 8′	37	48.7	51.8	54.3	57.1	2.0	. .	44.6	49.0	51.6	54.7	58.1	21 23.19	− 0.81	−28.30	23 20 54.08	− 3.02
	Radcliffe 6081	38	. .	. .	. .	47.3	49.8	52.9	56.6	58.6	. .	. .	. .	21 53.04	− 0.67	−28.30	23 21 24.07	− 3.02
	Lalande 46496	39	46.5	48.1	50.3	2.5	4.0	5.6	7.1	8.8	20.8	23.3	25.1	38 5.65	− 0.09	−28.29	23 37 37.27	− 3.27
	B. A. C. 8280	40	41.6	44.7	49.3	12.5	15.7	18.8	22.0	25.2	48.5	53.4	56.2	43 18.90	− 0.84	− 28.29	23 42 49.77	− 3.30
	β Ceti	41	30.3	31.9	34.6	47.4	49.1	50.7	52.3	54.0	6.5	9.1	0.9	37 50.62	+ 0.11	−28.24	0 37 22.49	− 3.66
	Lacaille 220	42	44.3	45.9	48.8	2.4	4.1	6.3	8.0	9.7	23.4	26.5	28.3	43 6.15	+ 0.20	−28.24	0 42 38.11	− 3.86
	Lalande 1504	43	51.2	53.0	56.0	11.4	13.8	15.6	17.7	19.3	34.7	38.0	40.0	48 15.52	− 0.41	−28.23	0 47 46.88	− 3.44
	ϕ^4 Ceti	44	40.3	41.8	44.4	56.4	58.3	59.7	1.5	3.0	15.2	17.8	19.7	52 59.83	+ 0.06	−28.23	0 52 31.66	− 3.54
	Polaris	45	. .	. .	. .	17.0	21.0	34.0	43.0	45.0	. .	. .	. .	14 32.00	− 20.39	−28.22	. . . .	− 42.64
9	δ Aquilæ	46	19.3	21.0	23.5	35.3	37.0	38.6	40.2	41.7	53.9	56.3	57.8	19 38.60	− 0.01	−24.68	. . . .	− 2.19
	B. A. C. 6700	47	18.7	20.4	23.2	35.9	37.4	39.2	40.9	42.4	55.4	57.9	59.6	28 39.18	+ 0.15	−24.68	19 28 14.65	− 2.74
	* + 7° 18′	48	47.6	49.3	51.9	3.9	5.5	7.2	8.7	10.4	22.4	24.8	26.5	31 7.11	− 0.03	−24.68	19 30 42.40	− 2.15
	γ Aquilæ	49	26.2	28.0	30.4	42.6	44.0	45.7	47.4	49.1	1.3	3.7	5.3	40 45.79	− 0.06	−24.68	. . . .	− 2.14
	λ Ursæ Minoris	50	. .	. .	. .	14.0	34.0	2.0	29.0	53.0	. .	. .	. .	49 2.40	− 23.32	−24.69	. . . .	− 48.80
	* + 36° 44′	51	23.4	25.4	28.6	43.6	45.6	47.6	49.7	51.8	6.4	9.5	11.5	56 47.55	− 0.26	−24.69	19 56 22.60	− 1.65
	* + 36° 43′	52	. .	. .	. .	25.0	28.1	30.2	43.6	46.8	48.9	50.9	53.3	57 40.85	− 34.89	−24.69	19 56 41.27	− 1.65

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1875. h.	s.	s.	s.	s.
Oct. 7, 21.7	− 28.38	+ 0.047	− 0.45	− 0.04
9, 19.5	− 24.66	− 0.018	− 0.36	+ 0.01

October 9, 11h. Image east 0r.18; clamp west.
Image east 0r.30; clamp east.

Date and Observer.	OBJECT.	Number.	SECONDS OF TRANSIT.												CORRECTIONS.		Observed R. Ascension.	Reduct'n to 1875.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
														m. s.	s.	s.	h. m. s.	s.
1875. Oct. 9 Y.	* + 33° 7′	1	. .	. .	. .	8.0	9.7	11.8	13.6	15.6	. .	. .	. .	1 11.74	− 0.21	−24.69	20 0 46.84	− 1.77
	* + 33° 7	2	59.3	1.4	4.4	18.6	20.3	22.1	24.3	26.3	40.0	43.4	45.2	2 22.35	− 0.22	− 24.69	20 1 57.44	− 1.78
	Lalande 38708	3	22.6	24.6	27.9	43.0	45.0	47.1	49.4	51.5	6.7	9.9	11.7	5 47.22	− 0.28	−24.69	20 5 22.25	− 1.65
	25 Vulpeculæ.	4	46.8	48.5	51.3	4.3	6.0	7.7	9.7	11.4	24.4	27.1	28.9	17 7.83	− 0.15	−24.69	20 16 42.99	− 2.07
	B. A. C. 7114	5	6.9	9.1	12.5	28.3	30.1	32.2	34.6	36.5	52.1	55.5	57.6	30 32.31	− 0.30	−24.70	20 30 7.31	− 1.77
	* + 37° 45′	6	59.6	1.6	4.0	20.0	22.0	24.0	26.3	28.2	42.9	46.2	48.0	34 23.98	− 0.27	−24.70	20 33 59.01	− 1.87
	52 Cygni	7	34.8	36.8	39.6	53.3	55.2	57.1	59.0	0.9	14.6	17.5	19.2	40 57.09	− 0.20	−24.70	20 40 32.19	− 2.08
	* + 38° 49′	8	28.5	30.6	33.7	49.0	51.0	53.0	55.0	57.4	12.6	15.7	17.8	44 53.12	− 0.28	−24.70	20 44 28.14	− 1.92
	17 Delphini	9	49.1	50.8	53.2	5.9	7.1	8.7	10.5	12.0	24.4	26.8	28.4	50 8.81	− 0.07	−24.70	20 49 44.04	− 2.56
Nov. 11	1 Pegasi	10	37.5	39.0	41.6	54.0	55.7	57.4	59.2	0.9	13.5	16.3	17.9	16 57.55	− 0.38	−36.77	21 16 20.40	− 2.00
	β Aquarii.	11	19.0	20.5	22.0	35.0	36.4	38.2	39.9	41.5	53.4	56.1	57.6	25 38.23	− 0.26	−36.77	21 25 1.20	− 2.58
	5 Pegasi	12	13.6	15.1	17.8	30.3	32.0	33.8	35.6	37.0	49.7	52.3	54.2	32 33.76	− 0 44	−36.77	21 31 56.55	− 2.11
	Weisse (2) 871.	13	1.7	3.5	6.5	21.0	22.7	24.7	26.6	28.7	43.0	46.0	48.0	36 24.76	− 0.60	−36.77	21 35 47.39	− 1.77
	* + 34° 6′	14	. .	. .	. .	0.7	3.7	5.8	19.0	22.0	24.0	26.0	28.4	37 16.20	− 34.12	−36.77	21 36 5.31	− 1.77
	B. A. C. 7584	15	34.5	36.3	38.9	52.2	53.8	55.8	57.6	59.2	. .	. .	. .	40 48.54	+ 6.64	−36.78	21 39 18.40	− 2.03
	B. A. C. 7586	16	. .	. .	. .	38.3	41.1	42.9	55.2	57.9	59.6	1.5	3.5	41 52.50	− 31.12	−36.78	21 40 44.60	− 2.03
	Lacaille 8915	17	29.3	30.9	33.9	48.9	50.8	52.8	54.8	56.9	11.6	14.8	16.8	45 52.86	− 0.20	−36.78	21 45 15.88	− 3.41
	O. Arg. S. 21796	18	59.6	1.3	3.9	17.0	18.8	20.6	22.3	23.9	37.1	39.7	41.6	54 20.53	− 0.23	−36.78	21 53 43.52	− 3.11
	O. Arg. S. 21964	19	10.0	11.5	14.3	. .	. .	. .	. .	. .	46.5	48.8	51.7	5 30.47	− 0.23	−36.78	22 4 53.46	− 3.12
	θ Aquarii	20	34.8	36.4	38.8	50.8	52.5	54.2	55.9	57.5	9.3	11.8	13.6	10 54.15	− 0.29	−36.79	22 10 17.07	− 2.87
	* − 8° 6′	21	. .	. .	. .	18.2	19.7	21.4	23.1	24.7	. .	. .	. .	16 21.42	− 0.30	−36.79	22 15 44.33	− 2.88
	* − 8° 6′	22	57.6	59.4	1.1	2.6	5.3	. .	6.0	8.5	10.3	12.0	14.0	16 35.68	− 0.22	−36.79	22 15 58.67	− 2.88
	* − 31° 5′	23	27.5	29.0	31.9	46.0	47.9	49.8	51.7	53.5	. .	. .	. .	23 42.16	+ 7.35	−36.79	22 23 12.72	− 3.43
	O. Arg. N. 24689	24	36.9	39.9	44.0	7.0	. .	13.5	. .	19.5	41.8	46.5	49.7	43 13.20	− 1.08	−36.79	22 42 35.33	− 1.80
	Lalande 44848	25	. .	. .	. .	29.4	31.3	33.5	35.5	37.4	. .	. .	. .	49 33.42	− 0.62	−36.80	22 48 56.00	− 2.39
	* + 35° 22′	26	. .	. .	. .	46.1	48.1	50.1	52.2	54.0	. .	. .	. .	49 50.10	− 0.62	−36.80	22 49 12.68	− 2.39
	* + 35° 22′	27	6.8	9.0	10.9	13.0	14.3	. .	30.0	33.0	35.0	37.0	39.4	49 52.84	− 0.52	−36.80	22 49 15.52	− 2.39
	α Pegasi	28	52.3	54.0	56.5	8.7	10.4	12.1	13.8	15.4	27.7	30.3	32.1	59 12.12	− 0.41	−36.80	22 59 34.91	− 2.77
	Lalande 45323	29	19.4	21.2	24.5	39.7	41.7	43.8	45.8	47.8	2.8	6.2	8.2	3 43.74	− 0.65	−36.80	23 3 6.29	− 2.48
	O. Arg. S. 22712	30	23.0	24.6	27.2	40.3	41.8	43.7	45.5	47.3	0.2	2.9	4.6	9 43.74	− 0.24	−36.80	23 9 6.70	− 3.43
	* + 66° 21′	31	. .	. .	. .	42.9	46.7	51.2	55.2	59.0	. .	. .	. .	17 51.00	− 1.50	−36.81	23 17 12.69	− 2.18
	Radcliffe 6881.	32	28.5	31.0	35.1	55.4	58.3	0.8	4.0	6.0	27.0	31.4	33.8	22 1.11	− 0.96	−36.81	23 21 23.34	− 2.47
	* + 35° 6′	33	8.7	10.6	13.7	28.2	30.2	32.1	34.2	36.0	50.5	53.8	55.8	31 32.16	− 0.61	−36.81	23 30 54.74	− 2.78
	Weisse (2) 658	34	. .	. .	. .	15.1	18.0	20.0	33.6	36.8	38.6	40.7	43.0	32 30.72	− 34.54	−36.81	23 31 19.37	− 2.78
	Lalande 767	35	29.6	31.4	34.4	49.0	50.7	53.0	55.1	56.8	11.3	14.4	16.0	26 52.94	− 0.61	−36.83	0 26 15.50	− 3.26
	Weisse 510	36	35.8	37.5	39.9	51.8	53.3	55.2	57.0	58.4	10.4	13.1	14.7	31 55.19	− 0.37	−36.83	0 31 17.99	− 3.36
	λ Sculptoris	37	58.0	59.9	3.2	18.7	20.4	22.8	25.0	26.8	42.3	45.4	47.7	37 22.75	− 0.19	−36.83	0 36 45.73	− 4.06
	Lacaille 220	38	53.6	54.9	57.9	11.5	13.	15.3	17.1	18.9	32.6	35.4	37.2	43 15.25	− 0.22	−36.83	0 42 38.20	− 3.82
	Lalande 1504	39	57.6	59.6	2.9	18.1	20.0	21.0	24.2	25.0	41.2	44.5	46.6	48 22.05	− 0.64	−36.83	0 47 44.58	− 3.46
	70 Piscium	40	58.2	59.8	2.2	14.3	15.7	17.5	19.0	20.6	32.8	35.2	36.9	56 17.47	− 0.37	−36.83	0 55 40.27	− 3.47
	ε Piscium	41	48.6	50.3	52.5	4.8	6.3	8.0	9.6	11.3	23.2	25.7	27.6	57 7.99	− 0.37	−36.83	0 57 30.79	− 3.47
	Polaris	42	. .	. .	. .	26.0	32.0	14.0	53.0	58.0	. .	. .	. .	14 42.60	− 26.30	−36.84	. . . .	− 39.03
	η Piscium	43	8.9	10.5	13.0	25.3	26.9	28.6	30.3	31.8	44.1	47.0	48.5	25 28.63	− 0.42	−36.84	1 24 51.37	− 3.59
12	ξ Aquarii	44	26.5	28.0	30.4	42.7	44.0	45.7	47.4	48.9	1.0	3.6	5.3	31 45.77	− 0.31	−37.11	21 31 8.35	− 2.65
	ε Pegasi	45	23.2	24.8	27.2	39.4	40.9	42.6	44.3	45.8	57.9	0.4	2.2	38 42.61	− 0.37	−37.11	21 38 5.13	− 2.33
	B. A. C. 7599	46	. .	. .	. .	32.1	33.8	35.6	37.2	39.0	. .	. .	. .	43 35.54	− 0.30	−37.11	21 42 58.13	− 2.81
	* + 52° 15′	47	19.4	22.2	25.7	46.4	48.1	50.8	53.2	55.9	15.5	19.8	22.3	3 50.85	− 0.81	−37.11	22 3 12.93	− 1.42
	B. A. C. 7772	48	28.2	29.8	32.1	44.1	45.8	47.3	49.0	50.5	2.3	4.9	6.5	10 47.32	− 0.32	−37.11	22 10 9.89	− 2.74
	* − 35° 7′	49	47.7	49.5	52.4	7.4	9.2	11.0	12.9	14.8	29.5	32.6	34.5	14 11.05	− 0.26	−37.11	22 13 33.68	− 3.49

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	n	c
1875. h.	s.	s.	s.	s.
Nov. 11, 23.0	− 36.80	− 0.018	− 0.29	− 0.33
12, 23.5	− 37.11	+ 0.002	− 0.21	− 0.33

Date and Observer.	OBJECT.	Number.	SECONDS OF TRANSIT. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed R. Ascension.	Reduct'n to 1875.0.
1875.														m. s.	s.	s.	h. m. s.	s.
Nov. 12 Y.	*−35° 7′ . . .	1	0.9	2.5	5.5	. .	. .	. .	. .	. .	42.6	45.6	47.7	15 24.13	— 0.25	−37.11	22 14 46.77	— 3.49
	*−35° 7′ . . .	2	. .	. .	. .	27.4	29.1	31.2	33.1	35.0	. .	. .	. .	15 31.16	— 0.27	−37.11	22 14 53.78	— 3.49
	*−31° 5′ . . .	3	27.7	29.4	32.0	46.3	48.0	50.0	51.7	53.7	7.7	10.4	12.4	25 49.94	— 0.26	−37.11	22 25 12.57	— 3.42
	O. Arg. S. 22224 .	4	26.7	28.5	31.4	45.0	46.5	48.3	50.5	52.0	5.9	8.1	10.3	28 48.47	— 0.26	−37.11	22 28 11.10	-- 3.36
	ζ Pegasi	5	34.5	36.0	38.5	50.6	52.2	53.9	55.6	57.1	9.2	11.7	13.6	35 53.90	— 0.37	−37.11	22 35 16.42	— 2.67
	Lalande 45323. .	6	19.7	21.6	24.8	40.2	42.0	44.1	46.1	48.2	3.4	6.5	8.6	3 41.11	— 0.59	−37.11	23 3 6.41	— 2.46
	*+66° 21′ . . .	7	3.8	7.2	13.4	43.3	47.0	50.9	55.5	59.1	28.8	35.0	39.1	17 51.19	— 1.30	−37.11	23 17 12.78	— 2.14
	*+66° 18′ . . .	8	14.7	18.4	24.6	54.4	57.9	2.3	6.3	9.8	39.7	45.8	50.0	21 2.17	— 1.30	−37.11	23 20 23.76	— 2.22
	*+35° 6′ . . .	9	9.2	10.9	14.0	28.7	30.4	32.5	34.6	36.5	50.9	54.0	56.0	31 32.52	— 0.56	−37.11	23 30 54.85	— 2.76
	Weisse (2) 658. .	10	. .	. .	. .	15.1	18.3	20.4	33.8	37.0	38.9	40.9	43.2	32 30.95	- 34.49	−37.11	23 31 19.35	— 2.76
	Lalande 46496. .	11	55.4	57.0	59.4	. .	. .	. .	. .	. .	29.9	32.3	34.2	38 14.70	— 0.35	−37.11	23 37 37.24	— 3.09
	79 Pegasi	12	38.8	40.5	43.4	56.9	58.5	0.6	2.2	4.1	17.6	20.4	22.4	44 0.49	— 0.49	−37.11	23 43 22.89	— 2.93
	B. A. C. 8296 . .	13	22.8	24.5	27.0	39.8	41.4	43.2	45.0	46.8	59.4	2.2	4.0	46 43.28	— 0.43	−37.11	23 46 5.74	— 3.00
	*+21° 2′ . .	14	. .	. .	. .	15.8	18.5	20.3	32.2	34.8	36.4	38.3	40.4	47 29.59	— 30.17	−37.11	23 46 22.31	— 3.00
	*+ 0° 21′ . . .	15	57.8	59.2	1.4	13.6	15.2	16.8	18.4	19.8	32.0	34.3	36.0	54 16.77	— 0.33	−37.11	23 53 39.33	— 3.24
	Weisse 1090 . .	16	. .	. .	. .	47.6	49.1	51.0	52.5	54.0	. .	. .	. .	54 50.84	— 0.34	−37.11	23 54 13.39	— 3.24
	Lamont 9388 . .	17	36.3	37.8	40.2	52.4	53.8	55.6	57.1	58.5	10.7	13.2	14.9	57 55.50	— 0.33	−37.11	23 57 18.06	— 3.25
	Weisse 1179 . .	18	43.6	45.4	47.7	59.7	1.3	3.1	4.5	6.1	17.9	20.5	22.2	59 2.91	— 0.33	−37.11	23 58 25.47	— 3.25
	Lalande 47310. .	19	52.5	54.6	57.6	12.5	14.5	16.6	18.6	20.6	35.3	38.5	40.5	2 16.53	— 0.57	−37.11	0 1 38.85	— 3.04
	*+36° 42′ . . .	20	0.9	2.8	5.7	20.9	22.6	24.8	27.0	28.8	42.6	46.7	48.9	6 24.70	— 0.57	−37.11	0 5 47.02	— 3.07
	Lalande 100 . .	21	. .	. .	. .	11.6	13.6	15.7	17.9	19.8	. .	. .	. .	7 15.72	— 0.58	−37.11	0 6 38.03	— 3.08
	Lalande 231 . .	22	39.4	41.3	44.5	59.8	2.0	4.1	6.2	8.0	23.5	26.7	29.0	11 4.05	— 0.60	−37.11	0 10 26.34	— 3.12
	Lalande 409 . .	23	58.7	0.5	3.7	18.7	20.8	22.8	24.8	26.7	41.7	44.6	46.9	16 22.72	— 0.57	−37.11	0 15 45.04	— 3.16
	Lalande 489 . .	24	46.0	47.9	51.0	6.3	8.1	10.4	12.6	14.3	29.5	32.7	34.9	19 10.34	— 0.59	−37.11	0 18 32.64	— 3.19
	*−36° 25′ . . .	25	29.8	31.2	34.5	49.5	51.0	53.3	55.1	57.3	11.9	14.8	17.4	23 53.25	— 0.26	−37.11	0 23 15.88	— 3.95
	Weisse 444 . .	26	. .	. .	. .	14.6	15.9	17.7	19.3	20.9	. .	. .	. .	28 17.68	— 0.31	−37.11	0 27 40.26	— 3.48
	β Ceti	27	39.6	41.1	43.7	56.4	58.1	59.9	1.6	3.1	15.8	18.3	20.1	37 59.79	— 0.28	−37.11	0 37 22.40	— 3.63
	*−24° 5′ . . .	28	55.6	57.3	59.6	12.9	14.6	16.5	18.3	20.0	33.1	35.9	37.6	43 16.49	— 0.27	−37.11	0 42 39.11	— 3.72
	Lacaille 224 . .	29	. .	. .	. .	1.7	4.5	6.5	18.6	21.1	22.9	24.8	27.0	44 15.89	— 30.67	−37.11	0 43 8.11	— 3.72
	ϕ^4 Ceti	30	49.7	51.1	53.7	5.9	7.5	9.2	10.9	12.5	24.6	27.2	28.8	53 9.19	— 0.29	−37.11	0 52 31.79	— 3.58
	Polaris	31	. .	. .	. .	23.0	32.0	39.0	49.0	53.0	. .	. .	. .	14 39.20	— 24.10	−37.11	. . . .	— 38.79
	η Piscium . . .	32	9.0	10.7	13.2	25.5	27.1	28.8	30.6	32.2	44.4	47.2	48.7	25 28.85	— 0.38	−37.11	1 24 51.36	— 3.59
	B. A. C. 491 . .	33	44.4	45.9	48.5	0.5	2.2	3.9	5.5	7.0	19.0	21.7	23.3	32 3.81	— 0.30	−37.11	1 31 26.40	— 3.66
	*+39° 44′ . . .	34	31.0	32.9	36.2	51.6	53.9	56.1	58.2	0.3	15.5	18.8	21.1	35 55.94	— 0.60	−37.11	1 35 18.23	— 3.88
	ο Piscium . . .	35	. .	. .	. .	43.9	46.4	48.2	59.2	1.7	3.4	5.0	7.0	39 56.85	— 28.44	−37.11	1 38 51.30	— 3.64
16	B. A. C. 7599 . .	36	. .	. .	. .	32.0	33.5	35.4	37.1	38.7	. .	. .	. .	43 35.34	— 0.26	−36.80	21 42 58.28	— 2.79
	μ Capricorni. . .	37	48.9	50.5	53.0	5.3	6.9	8.6	10.4	11.9	24.2	26.8	28.5	47 8.64	— 0.25	−36.80	21 46 31.59	— 2.81
	O. Arg. S. 21796 .	38	. .	. .	. .	17.0	18.8	20.7	22.4	24.0	. .	. .	. .	54 20.58	— 0.19	−36.79	21 53 43.60	— 3.04
	α Aquarii . . .	39	42.5	43.9	46.4	58.3	59.7	1.5	3.1	4.7	16.4	19.0	20.8	0 1.48	— 0.34	−36.79	21 59 24.35	— 2.60
	α Andromedæ . .	40	14.4	16.0	. .	32.4	34.3	36.2	38.1	39.9	. .	56.1	57.9	2 36.14	— 0.59	−36.73	0 1 58.82	— 3.04
	γ Pegasi	41	8.7	10.1	12.7	25.0	26.6	28.4	30.1	31.7	43.9	46.4	48.2	7 28.35	— 0.48	−36.73	0 6 51.14	— 3.16
	Lalande 231 . . .	42	38.9	40.8	44.2	59.5	1.5	3.5	5.8	7.7	23.2	26.4	28.5	11 3.64	— 0.82	−36.73	0 10 26.09	— 3.07
	Lalande 409 . .	43	58.5	0.3	3.4	18.5	20.4	22.4	24.5	26.4	41.2	44.6	46.6	16 22.44	— 0.78	−36.72	0 15 44.94	— 3.13
	Weisse 321 . .	44	55.4	56.9	59.3	11.5	12.7	14.4	16.1	17.6	29.5	32.3	33.9	21 14.51	— 0.32	−36.72	0 20 37.47	— 3.38
	*+35° 8′ . . .	45	35.7	37.6	40.4	55.4	57.2	59.3	0.8	2.9	17.6	20.7	22.6	25 59.11	— 0.75	−36.72	0 25 21.64	— 3.22
	Weisse 510 . .	46	35.8	37.4	39.8	51.9	53.6	55.0	56.9	58.4	10.4	12.9	14.4	31 55.14	— 0.41	−36.72	0 31 18.01	— 3.34
	Weisse 588 . .	47	41.6	43.2	45.5	57.5	59.1	0.8	2.4	3.8	15.9	18.5	20.2	36 0.77	— 0.37	−36.72	0 35 23.68	— 3.38
	*−1° 53′ . . .	48	42.4	44.0	46.2	58.4	59.9	1.6	3.2	4.8	16.5	19.2	20.8	40 1.54	— 0.34	−36.71	0 39 24.49	— 3.43
	O. Arg. S. 435. .	49	55.2	56.8	59.3	12.8	14.3	16.1	18.0	19.7	32.8	35.8	37.4	43 16.20	— 0.18	−36.71	0 42 39.31	— 3.70

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1875. h.	s.	s.	s.	s.
Nov. 16, 23.0	— 36.76	+ 0.028	— 0.45	— 0.35

Date and Observer.	OBJECT.	Number.	SECONDS OF TRANSIT.												CORRECTIONS.		Observed. R. Ascension.	Reduct'n to 1875.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
														m. s.	s.	s.	h. m. s.	s.
1875. Nov. 17 Y.	B. A. C. 8010 . .	1	8.9	10.2	12.8	24.9	26.5	28.3	29.8	31.5	43.7	46.2	47.8	54 28.24	— 0.28	—36.86	22 53 51.10	— 3.04
	α Pegasi	2	52.5	53.8	56.6	9.0	10.2	12.1	13.9	15.7	27.6	30.2	32.1	59 12.15	— 0.48	—36.86	22 58 34.81	— 2.71
	O. Arg. S. 22670 .	3	. .	. .	. .	35.7	37.4	39.0	40.6	42.4	. .	. .	. .	6 39.02	— 0.23	—36.87	23 6 1.92	— 3.25
	O. Arg. S. 22721 .	4	18.3	19.6	22.3	34.9	. .	38.5	. .	42.1	54.9	57.5	59.4	10 38.61	— 0.19	—36.87	23 10 1.55	— 3.34
	O. Arg. S. 22723 .	5	. .	. .	. .	8.5	11.3	13.1	25.0	27.8	29.5	31.4	33.2	11 22.48	— 30.09	—36.87	23 10 15.52	— 3.34
	θ Piscium . . .	6	58.7	0.1	2.6	14.7	16.1	17.9	19.4	21.2	33.4	35.7	37.3	22 17.92	— 0.40	—36.88	23 21 40.64	— 2.96
	75 Pegasi . . .	7	58.6	0.2	2.6	15.1	16.9	18.6	20.4	22.0	34.5	36.9	38.8	32 18.60	— 0.51	—36.89	23 31 41.20	— 2.89
	Lalande 46496 .	8	55.3	56.7	59.3	11.2	12.7	14.7	16.1	17.8	29.7	32.2	34.0	38 14.52	— 0.40	—36.90	23 37 37.22	— 3.04
	B. A. C. 8280 . .	9	50.5	53.3	58.1	21.4	24.5	27.5	31.5	34.1	57.4	2.0	5.4	43 27.79	— 1.45	—36.90	23 42 49.44	— 2.61
	Lacaille 9701 . .	10	53.3	55.0	58.2	12.8	14.7	16.6	18.7	20.5	35.1	38.4	40.3	57 16.69	— 0.11	—36.92	23 56 39.66	— 3.81
	B. A. C. 8375 . .	11	47.4	49.5	52.5	8.0	10.0	12.0	14.0	15.9	31.8	34.8	37.1	1 12.09	— 0.08	—36.92	0 0 35.09	— 3.94
	γ Pegasi	12	8.9	10.3	12.7	25.6	26.9	28.5	30.3	31.9	44.2	46.7	48.6	7 28.60	— 0.48	—36.92	0 6 51.20	— 3.15
	Lalande 489 . .	13	. .	46.3	49.3	4.5	6.0	8.3	10.8	12.9	28.2	31.3	. .	19 8.62	— 0.82	—36.94	0 18 30.86	— 3.14
	* — 36° 25′ . .	14	29.1	31.2	33.9	49.5	51.3	53.0	55.0	56.9	12.1	15.0	17.0	23 53.09	— 0.10	—36.94	0 23 16.05	— 3.90
	Lalande 767 . .	15	29.5	31.6	34.5	49.3	51.2	53.3	55.0	57.0	11.7	14.8	16.8	26 53.15	— 0.75	—36.94	0 26 15.46	— 3.22
	β Ceti.	16	39.5	40.9	43.4	56.2	57.9	59.5	1.4	2.8	15.5	18.0	19.6	37 59.52	— 0.22	—36.95	0 37 22.35	— 3.60
	Lamont 223 . .	17	. .	. .	. .	41.4	43.1	45.0	47.0	48.7	. .	. .	. .	43 45.04	— 0.19	—36.96	0 43 7.89	— 3.70
	Lalande 1504 . .	18	36.8	39.1	41.2	43.0	46.6	. .	3.5	6.6	8.5	10.7	13.2	48 24.92	— 0.72	—36.96	0 47 47.24	— 3.43
	* — 38° 28′. . .	19	0.5	2.6	5.2	21.0	22.8	24.6	26.3	28.6	44.1	47.3	49.6	48 24.78	— 0.81	—36.96	0 47 47.01	— 3.43
	Polaris. . . .	20	. .	. .	. .	34.0	40.0	48.0	1.0	5.0	. .	. .	. .	14 49.60	— 35.13	—36.98	. . . .	— 37.11
	η Piscium . . .	21	9.0	10.7	13.1	25.6	27.1	28.8	30.5	32.2	44.5	47.2	48.8	25 28.86	— 0.48	—37.00	1 24 51.38	— 3.59
	B. A. C. 466 . .	22	. .	. .	. .	20.4	23.5	25.6	39.6	42.8	44.7	46.9	49.3	28 36.60	— 35.08	—37.00	1 27 24.52	— 3.99
	* + 39° 56′. . .	23	29.2	31.2	34.4	50.0	52.0	54.3	56.4	58.1	13.9	17.1	19.3	33 54.17	— 0.83	—37.01	1 33 16.33	— 3.86
	τ Ceti.	24	36.4	37.9	40.6	52.9	54.5	56.1	58.0	59.4	11.9	13.8	16.4	38 56.17	— 0.23	—37.01	1 38 18.93	— 3.71
	* + 36° 40′. . .	25	6.9	8.6	11.9	26.8	28.5	30.5	32.5	34.6	49.5	52.6	54.5	46 30.63	— 0.77	—37.02	1 45 52.84	— 3.91
	* + 36° 40′. . .	26	43.5	46.1	47.9	50.0	53.1	. .	8.3	11.2	13.2	15.4	17.9	46 30.66	— 0.68	—37.02	1 45 52.96	— 3.91
	B. A. C. 627 . .	27	58.4	0.1	3.2	17.0	18.6	20.7	22.5	24.5	38.2	41.2	43.3	56 20.70	— 0.14	—37.02	1 55 43.54	— 3.87
	Weisse I, 1048 .	28	19.8	21.2	23.5	35.6	37.3	38.9	40.4	41.9	54.0	56.5	58.2	0 38.85	— 0.31	—37.03	2 0 1.51	— 3.70
	ξ^1 Ceti.	29	44.6	46.0	48.3	0.6	2.1	3.8	5.3	6.9	19.0	21.6	23.2	7 3.76	— 0.42	—37.03	2 6 26.31	— 3.74
27	Weisse (2) 1148 .	30	3.5	5.1	7.8	20.9	22.6	24.5	26.3	28.2	41.1	43.9	45.8	49 24.52	— 0.55	—34.62	2 48 49.35	— 4.13
	α Ceti.	31	4.4	6.0	8.5	20.2	21.9	23.7	25.3	27.0	38.8	41.4	42.9	56 23.65	— 0.39	—34.62	2 55 48.64	— 3.89
	Weisse 26 . . .	32	23.4	24.9	27.3	39.3	40.9	42.5	44.2	45.8	57.8	0.3	2.2	4 42.60	— 0.44	—34.60	3 4 7.56	— 3.97
	ζ Arietis	33	2.1	3.7	6.2	19.9	20.5	22.3	24.2	25.8	38.4	41.0	42.8	8 22.45	— 0.53	—34.60	3 7 47.32	— 4.15
	B. A. C. 1047 . .	34	42.3	43.7	46.4	59.8	1.6	3.4	5.3	7.0	20.5	23.3	25.1	16 3.49	— 0.24	—34.59	3 15 28.66	— 3.82
	17 Eridani . . .	35	44.6	46.0	48.6	0.4	2.1	3.9	5.5	7.0	19.0	21.3	23.2	25 3.78	— 0.34	—34.58	3 24 28.86	— 3.88
	Lacaille 1124 . .	36	50.4	51.9	54.8	7.8	9.2	11.4	12.4	15.1	28.1	30.9	32.8	27 11.35	— 0.24	—34.58	3 26 36.53	— 3.81
	B. A. C. 1130 . .	37	52.7	54.4	57.0	10.4	12.4	14.2	16.2	17.9	31.2	34.3	36.2	34 14.26	— 0.23	—34.57	3 33 39.46	— 3.80
	Lacaille 1196 . .	38	25.0	26.8	29.5	43.5	45.3	47.2	49.3	51.2	5.0	7.8	9.8	38 47.31	— 0.22	—34.57	3 38 12.52	— 3.81
	Weisse (2) 882. .	39	36.2	38.3	41.7	58.7	0.6	3.0	5.3	7.4	24.2	27.7	30.1	42 3.02	— 0.86	—34.56	3 41 27.60	— 4.42
	Lalande 7206 . .	40	42.0	43.8	47.0	1.0	3.2	5.4	7.3	9.4	23.6	26.8	28.8	49 5.30	— 0.70	—34.56	3 48 30.04	— 4.69
	γ^1 Eridani . . .	41	30.8	32.4	34.9	47.2	48.9	50.6	52.3	53.9	6.0	8.7	10.3	52 50.55	— 0.30	—34.55	3 52 15.70	— 3.84
	Lalande 7773 . .	42	36.7	38.7	41.5	58.9	1.2	3.1	4.3	7.6	24.2	27.7	30.0	6 3.08	— 0.86	—34.54	4 5 27.68	— 5.22
	* + 44° 28′. . .	43	37.3	39.4	42.8	. .	. .	. .	. .	. .	25.4	28.8	30.9	7 4.10	— 0.85	—34.54	4 6 28.71	— 5.22
	51 Tauri	44	18.4	19.9	22.6	35.5	37.1	38.9	40.7	42.3	55.0	57.7	59.4	11 38.86	— 0.53	—34.53	4 11 3.80	— 4.36
	α Tauri	45	4.3	5.9	8.5	20.8	22.4	. .	26.0	27.6	40.0	42.5	44.3	29 24.23	— 0.47	—34.51	4 28 49.25	— 4.28
30	θ Piscium . . .	46	56.2	57.6	59.9	12.1	13.6	15.0	16.8	18.4	30.2	33.0	34.8	22 15.24	— 0.41	—34.37	23 21 40.46	— 2.83
	α Andromedæ . .	47	12.0	13.7	16.4	29.9	31.6	33.5	35.7	37.5	50.9	53.7	55.6	2 33.68	— 0.61	—34.40	0 1 58.67	— 2.89
	γ Pegasi	48	6.4	7.8	10.2	22.6	24.2	25.8	27.3	29.0	41.4	44.3	45.7	7 25.88	— 0.47	—34.41	0 6 51.00	— 3.04
	Weisse 305 . .	49	. .	. .	. .	5.6	7.2	8.8	10.4	12.2	. .	. .	. .	20 8.84	— 0.40	—34.42	0 19 34.02	— 3.20
	λ^1 Sculptoris. . .	50	55.4	57.5	0.5	15.9	17.6	19.8	22.1	24.3	39.2	42.8	44.7	37 19.98	— 0.19	—34.44	0 36 45.35	— 3.83
	O. Arg. S. 435. .	51	52.7	54.5	56.8	. .	. .	. .	. .	. .	30.3	33.2	35.0	43 13.75	— 0.24	—34.44	0.42 39.07	— 3.59

November 18. Image east $0^r.12$; clamp east.
Image east $0^r.90$, clamp west

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1869. h.	s.	s.	s.	s.
Nov. 17, 0.4	— 36.94	— 0.055	— 0.45	— 0.35
27, 3.6	— 34.57	+ 0.063	— 0.35	— 0.37
30, 1.2	— 34.47	— 0.056	— 0.35	— 0.37

Date and Observer.	OBJECT.	Number.	SECONDS OF TRANSIT.												CORRECTIONS.		Observed R. Ascension.	Reduct'n to 1875.0.
			I.	II.	III.	IV.	V.	VI.	VII	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
1875.														m. s.	s.	s.	h. m. s.	s.
Nov. 30 Y.	Lamont 223 . .	1	. .	. .	. .	. .	. .	. .	. .	. .	59.0	1.9	3.4	44 1.43	— 19.27	—34.44	0 43 7.72	— 3.59
	γ Cassiopeæ . . .	2	11.8	14.8	19.5	43.8	47.2	50.1	53.4	56.5	20.4	25.8	29.0	49 50.21	— 1.35	—34.45	0 49 14.41	— 3.55
	Weisse 972 . .	3	. .	. .	. .	7.1	8.6	10.2	11.9	13.8	25.5	27.8	29.5	57 16.80	— 7.00	—34.45	0 56 35.35	— 3.38
	O. Arg. S. 626. .	4	21.5	23.1	25.9	38.8	40.4	42.4	44.0	45.8	59.0	1.8	3.5	0 42.38	— 0.25	—34.46	1 0 7.67	— 3.63
	O. Arg. S. 635. .	5	25.9	27.5	30.2	43.0	45.0	47.0	49.0	50.5	3.6	6.1	8.0	1 46.89	— 0.25	—34.46	1 1 12.18	— 3.64
	B. A. C. 355 . .	6	31.6	33.4	36.0	50.7	52.4	54.3	56.2	58.1	12.4	15.5	17.6	5 54.38	— 0.21	—34.46	1 5 19.71	— 3.76
	Polaris	7	. .	. .	. .	20.0	26.0	35.0	47.0	53.0	. .	. .	. .	14 36.20	— 30.72	—34.47	. . . .	— 30.42
	η Piscium . . .	8	6.4	8.0	10.6	23.0	24.5	26.3	27.9	29.6	41.7	44.5	46.2	25 26.25	— 0.47	—34.48	1 24 51.30	— 3.55
	B. A. C. 491 . .	9	41.6	43.4	45.7	57.9	59.5	1.2	2.8	4.4	16.3	19.0	20.6	32 1.13	— 0.31	—34.49	1 31 26.33	— 3.61
	τ Ceti	10	34.0	35.4	38.1	50.5	51.9	53.9	55.5	57.1	9.6	12.3	13.8	38 53.83	— 0.28	—34.49	1 38 19.06	- 3.66
	Lalande 3390 . .	11	15.4	17.7	20.9	35.8	37.8	39.9	41.7	43.4	58.5	1.7	3.8	45 39.69	— 0.65	—34.50	1 45 4.54	— 3.87
	Weisse 155 . .	12	24.6	25.9	28.6	40.7	42.4	43.9	45.7	47.3	59.4	1.9	3.8	12 44.02	— 0.46	—34.53	2 12 9.03	— 3.80
	Lalande 4342 . .	13	. .	. .	. .	21.5	23.0	25.4	27.7	29.7	44.8	47.9	50.0	15 33.75	— 8.85	—34.53	2 14 50.37	— 4.15
	Lalande 749 . .	14	59.4	1.1	4.3	18.6	20.4	22.6	24.7	26.6	40.9	44.0	45.9	23 22.59	— 0.21	—34.54	2 22 47.84	— 3.87
	*—33° 42′ . . .	15	43.9	45.6	48.4	2.9	4.8	6.8	8.9	10.5	24.9	28.1	29.9	26 6.79	— 0.21	—34.54	2 25 32.04	— 3.87
	B. A. C. 803 . .	16	2.1	3.7	6.6	20.4	22.1	24.1	26.1	27.8	41.7	44.6	46.4	31 24.15	— 0.22	—34.54	2 30 49.39	— 3.84
	γ Ceti	17	9.0	10.5	13.0	25.0	26.6	28.5	30.0	31.4	43.5	45.8	47.3	37 28.32	— 0.39	—34.55	2 36 53.38	— 3.83
	Weisse (2) 1148 .	18	3.5	5.2	7.8	21.2	22.9	24.8	26.6	28.0	41.3	44.1	46.0	49 24.67	— 0.58	—34.56	2 48 49.53	— 4.15
	Weisse 1066 . .	19	33.4	34.6	37.0	49.7	51.1	53.0	54.6	56.3	8.4	11.1	13.4	1 52.96	— 0.47	—34.57	3 1 17.92	— 4.03
	Weisse 26 . . .	20	23.2	25.0	27.5	39.5	41.0	42.6	44.2	45.7	57.9	0.3	2.2	4 42.65	— 0.43	—34.58	3 4 7.64	— 3.98
	Lalande 5997 . .	21	43.1	44.7	47.4	0.0	1.4	2.9	4.8	6.5	19.0	21.6	23.4	8 3.16	— 0.28	—34.58	3 7 28.30	— 3.82
	B. A. C. 1047 . .	22	41.8	43.2	46.2	59.7	1.3	3.4	5.1	7.0	20.1	23.1	24.9	16 3.27	— 0.24	—34.59	3 15 28.44	— 3.82
	66 Arietis	23	27.1	28.5	31.3	44.1	45.8	47.7	49.3	51.1	3.8	6.6	8.4	21 47.61	— 0.54	—34.59	3 21 12.48	— 4.25
	η Tauri	24	22.0	23.8	26.3	39.5	41.0	42.8	44.6	46.2	59.2	2.1	4.0	40 42.86	— 0.56	—34.61	3 40 7.69	— 4.37
Dec. 2	ω Piscium . . .	25	13.4	15.0	17.5	29.7	31.1	32.8	34.4	36.2	48.0	50.4	52.3	53 32.80	— 0.42	—35.82	23 52 56.56	— 3.01
	B. A. C. 8374 . .	26	25.5	27.0	29.9	43.4	45.0	47.0	48.8	50.6	4.2	6.9	9.0	0 47.03	— 0.62	—35.83	0 0 10.58	— 2.85
	Lalande 100 . .	27	50.8	52.5	55.5	10.5	12.5	14.5	16.5	18.4	33.0	36.5	38.5	7 14.47	— 0.74	—35.83	0 6 37.90	— 2.85
	*+ 0° 27′ . . .	28	8.3	9.7	12.1	24.1	25.5	27.1	28.7	30.3	42.4	45.0	46.7	20 27.26	— 0.38	—35.84	0 19 51.04	— 3.21
	*+38° 16′ . . .	29	32.4	34.6	36.8	38.4	42.1	. .	58.8	2.1	4.0	6.2	8.6	25 20.40	— 0.68	—35.84	0 24 43.88	— 3.04
	Lalande 713 . .	30	59.9	1.8	4.7	20.0	21.8	34.1	26.1	28.1	43.4	46.5	48.6	25 24.09	— 0.77	—35.84	0 24 47.48	— 3.04
	(* 127) Washington	31	. .	. .	. .	48.5	49.6	51.4	52.9	54.7	. .	. .	. .	29 51.42	— 0.41	—35.84	0 29 15.17	— 3.25
	Lacaille 224 . .	32	42.9	44.5	47.0	0.2	1.9	3.9	5.8	7.4	20.2	22.9	24.9	44 3.78	— 0.26	—35.85	0 43 27.67	— 3.56
	γ Cassiopeæ . . .	33	13.1	15.8	21.4	45.2	48.1	51.5	55.1	58.2	21.8	26.6	29.8	49 51.51	— 1.37	—35.85	0 49 14.29	— 3.50
	Weisse 972 . .	34	51.9	53.8	56.5	. .	. .	. .	. .	. .	. .	. .	. .	56 54.07	+ 17.07	—35.86	0 56 35.28	— 3.37
	Polaris	35	. .	. .	. .	20.0	27.0	36.0	47.0	52.0	. .	. .	. .	14 36.40	— 31.32	—35.86	. . . .	— 29.06
	η Piscium . . .	36	7.9	9.4	12.0	24.5	26.1	27.8	29.5	30.8	43.3	46.0	47.7	25 27.73	— 0.49	—35.87	1 24 51.37	— 3.54
	o Piscium . . .	37	8.2	9.8	12.1	24.2	26.0	27.7	29.4	30.8	42.7	45.3	47.0	39 27.56	— 0.44	—35.88	1 38 51.24	— 3.62
	Lalande 3390 . .	38	17.3	19.3	22.2	37.2	39.1	41.2	43.2	45.2	59.8	3.2	5.2	45 41.17	— 0.74	—35.88	1 45 4.55	— 3.86
	Weisse 1048 . .	39	18.7	20.1	22.2	34.4	35.9	37.8	39.3	40.9	52.9	55.4	57.1	0 37.70	— 0.35	—35.89	2 0 1.46	— 3.69
	64 Ceti	40	5.7	7.5	9.9	22.0	23.6	25.5	27.0	28.5	40.4	43.2	44.8	5 25.28	— 0.43	—35.89	2 4 48.96	— 3.74
	Lalande 4238 . .	41	11.0	12.5	15.2	27.5	29.2	31.0	32.6	34.4	46.8	49.5	51.1	11 30.98	— 0.51	—35.89	2 10 54.58	— 3.83
	Lalande 4342 . .	42	3.1	5.2	8.0	. .	. .	. .	. .	. .	46.3	48.9	51.0	15 27.08	— 0.75	—35.90	2 14 50.43	— 4.15
	B. A. C. 766 . .	43	40.7	42.3	44.9	58.3	59.7	1.6	3.3	5.0	18.1	21.0	22.9	24 1.62	— 0.58	—35.90	2 23 25.14	— 3.99
	*+25° 41′ . . .	44	3.7	5.5	8.2	21.5	23.3	25.0	27.0	28.5	41.5	44.5	46.4	32 25.01	— 0.59	—35.90	2 31 48.52	— 4.06
	γ Ceti	45	10.5	12.0	14.5	26.5	27.9	29.6	31.2	32.6	44.5	47.2	48.8	37 29.57	— 0.40	—35.91	2 36 53.26	— 3.83
15	β Ceti	46	39.5	40.9	43.7	57.2	58.8	0.7	2.3	4.2	16.8	19.4	21.0	38 0.41	— 0.29	—38.07	0 37 22.05	— 3.35
	γ Cassiopeæ . .	47	15.3	18.1	23.1	47.0	50.4	53.6	56.7	59.8	23.7	28.7	32.1	49 53.50	— 1.35	—38.08	0 49 14.07	— 3.18
	Weisse 950 . .	48	. .	. .	. .	. .	. .	. .	37.8	40.4	41.9	43.5	45.6	56 41.82	— 34.97	—38.09	0 55 28.76	— 3.26
	Weisse 972 . .	49	. .	. .	. .	29.1	31.6	33.6	44.0	46.7	48.7	50.4	52.4	57 42.14	— 28.59	—38.09	0 56 35.46	— 3.27
	B. A. C. 326 . .	50	5.6	7.6	10.0	24.9	26.4	28.1	30.0	32.2	46.9	49.6	52.1	2 28.49	— 0.25	—38.10	1 1 50.14	— 3.58
	Lacaille 355 . .	51	35.8	37.4	39.9	54.3	55.8	57.9	0.0	1.9	16.0	19.2	21.0	5 58.11	— 0.25	—38.10	1 5 19.76	— 3.58

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1875. h.	s.	s.	s.	s.
Dec. 2, 1.4	— 35.87	— 0.031	— 0.35	— 0.38
15, 2.3	— 38.19	— 0.071	— 0.33	— 0.39

December 16. Image east 0r.14; clamp east.
Image east 1r.04; clamp west.
After adjusted level, collimation, and azimuth, and reversed the diaphragm.

Date and Observer.	OBJECT.	Number.	SECONDS OF TRANSIT.												CORRECTIONS.		Observed R. Ascension.	Reduct'n to 1875.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
														m. s.	s.	s.	h. m. s.	s.
1875. Dec. 15 Y.	Polaris	1	. .	. .	. .	12.0	18.0	29.0	41.0	45.0	. .	. .	. .	14 29.00	− 30.36	−38.11	. . . .	− 20.13
	η Piscium	2	. .	. .	. .	26.5	28.2	30.0	31.7	33.1	45.6	48.1	49.8	25 36.62	− 7.19	−38.13	1 24 51.30	− 3.46
	τ Andromedæ	3	30.0	32.0	35.4	50.8	52.9	55.3	57.5	59.3	15.0	18.3	20.4	33 55.17	− 0.79	−38.14	1 33 16.24	− 3.69
	*+36° 41′	4	19.5	21.0	24.5	39.4	41.3	43.3	45.4	47.2	2.1	5.5	7.5	45 43.34	− 0.74	−38.15	1 45 4.45	− 3.77
	Lalande 3412	5	. .	. .	. .	27.5	29.4	31.5	33.6	35.4	. .	. .	. .	46 31.48	− 0.75	−38.15	1 45 52.58	− 3.78
	B. A. C. 627	6	59.8	1.5	4.0	18.2	19.9	21.8	23.7	25.4	39.4	42.4	44.3	56 21.85	− 0.26	−38.16	1 55 43.43	− 3.68
	*−4° 59′	7	15.0	16.5	18.9	31.0	32.5	34.1	35.8	37.4	49.2	51.9	53.3	59 34.15	− 0.36	−38.17	1 58 55.62	− 3.63
	Weisse 1048	8	. .	. .	. .	36.8	38.3	40.0	41.6	43.1	. .	. .	. .	0 39.96	− 0.37	−38.17	2 0 1.42	− 3.63
	Lalande 4238	9	13.2	14.6	17.4	29.6	31.4	33.3	34.9	36.7	49.1	51.9	53.4	11 33.25	− 0.52	−38.18	2 10 54.55	− 3.79
	Lalande 4342	10	5.5	7.4	10.5	25.5	27.4	29.7	31.6	33.5	48.5	51.5	53.6	15 29.52	− 0.74	−38.19	2 14 50.59	− 4.09
	O. Arg. S. 1554	11	32.6	34.2	36.7	50.3	51.6	53.6	55.6	57.5	10.1	12.8	14.9	20 53.63	− 0.28	−38.19	2 20 15.16	− 3.71
	O. Arg. S. 1558	12	. .	. .	. .	34.3	37.0	38.9	51.0	53.6	55.4	57.1	59.6	21 48.36	− 30.76	−38.19	2 20 39.41	− 3.71
	Lacaille 767	13	16.1	17.7	20.4	35.0	36.6	38.4	40.6	42.3	56.8	0.0	2.0	25 38.72	− 0.25	−38.20	2 25 0.27	− 3.76
	B. A. C. 803	14	5.7	7.4	10.1	24.1	26.0	27.9	29.9	31.7	45.5	48.4	50.3	31 27.91	− 0.26	−38.20	2 30 49.45	− 3.75
	γ Ceti	15	12.8	14.3	16.8	28.6	30.2	32.0	33.6	35.2	47.0	49.5	51.2	37 31.93	− 0.41	−38.21	2 36 53.31	− 3.81
	*+8° 1′	16	53.9	55.4	57.9	10.1	11.4	13.1	14.8	16.3	. .	. .	. .	49 6.62	+ 6.10	−38.23	2 48 34.49	− 3.92
	Weisse 881	17	7.2	8.6	11.2	23.6	25.2	27.0	28.5	30.2	42.4	44.9	46.8	52 26.87	− 0.49	−38.23	2 51 48.15	− 4.01
	α Ceti	18	8.1	9.8	12.3	24.1	25.7	27.4	29.0	30.6	42.5	45.0	46.6	56 27.37	− 0.41	−38.23	2 55 48.73	− 3.91
	*+37° 6	19	. .	. .	. .	46.1	48.1	50.3	52.3	54.3	. .	. .	. .	58 50.22	− 0.75	−38.24	2 58 11.23	− 4.51
	*+38° 27′	20	55.9	58.2	0.2	2.4	5.6	. .	22.8	25.7	27.8	30.1	32.3	5 44.10	− 0.67	−38.25	3 5 5.18	− 4.61
	*+38° 29′	21	23.5	25.6	28.7	. .	. .	. .	. .	. .	7.5	10.6	12.9	5 48.13	− 0.75	−38.25	3 5 9.13	− 4.62
	*+38° 29′	22	. .	. .	. .	. .	. .	. .	43.9	47.1	49.2	51.3	53.8	6 49.06	− 44.26	−38.25	3 5 26.55	− 4.62
	Weisse (2) 209	23	22.9	24.4	27.2	40.1	41.9	43.7	45.5	47.8	. .	. .	. .	11 36.69	+ 6.50	−38.25	3 11 4.94	− 4.28
	*+31° 36′	24	. .	. .	. .	15.1	18.3	20.3	33.1	36.1	37.8	39.8	42.2	28 30.34	− 33.25	−38.27	3 27 18.82	− 4.57
	*+31° 36′	25	7.2	8.8	11.7	25.7	27.6	29.9	31.8	33.5	47.3	50.5	52.5	29 29.68	− 0.66	−38.27	3 28 50.75	− 4.58
	B. A. C. 1130	26	56.2	57.8	0.7	14.2	15.9	18.0	19.8	21.5	35.1	37.8	39.9	34 17.90	− 0.26	−38.28	3 33 39.36	− 3.81
	21 Tauri	27	50.2	51.9	54.5	7.6	9.2	11.1	13.0	14.6	27.8	30.4	32.3	39 11.15	− 0.58	−38.29	3 38 32.28	− 4.44
	22 Tauri	28	. .	. .	. .	. .	. .	. .	52.6	55.4	57.1	58.9	1.2	39 57.04	− 37.89	−38.29	3 38 40.86	− 4.44
	O. Arg. S. 2571	29	41.9	43.4	46.2	59.6	1.2	3.4	5.2	6.9	20.4	23.3	25.0	45 3.32	− 0.27	−38.29	3 44 24.76	− 3.83
	γ^1 Eridani	30	34.8	36.2	38.7	51.0	52.7	54.4	56.1	57.4	9.8	12.5	14.2	52 54.35	− 0.32	−38.30	3 52 15.73	− 3.92
17	ε Piscium	31	50.9	52.3	55.0	7.0	8.4	10.1	11.8	13.5	25.5	27.9	29.7	57 10.19	+ 0.06	−39.55	0 57 30.70	− 3.26
	B. A. C. 326	32	7.4	8.9	11.6	. .	. .	. .	. .	. .	48.6	51.2	53.2	2 30.18	− 0.12	−39.56	1 1 50.50	− 3.56
	Polaris	33	. .	. .	31.0	38.0	48.0	59.0	1.0	. .	. .	. .	. .	13 47.40	+ 10.75	−39.58	. . . .	− 18.36
	η Piscium	34	11.1	12.5	15.1	27.5	28.9	30.7	32.5	34.0	46.5	49.0	50.7	25 30.77	+ 0.09	−39.61	1 25 51.25	− 3.45
	Anonymous	35	37.6	38.7	41.1	54.7	56.0	57.4	58.8	0.2	. .	. .	. .	31 50.56	+ 6.53	−39.63	1 31 17.46	− 3.48
	o Piscium	36	11.3	12.6	15.5	27.5	29.1	30.8	32.4	33.9	45.8	48.5	50.3	39 30.73	+ 0.06	−39.64	1 38 51.15	− 3.54
	β Arietis	37	7.1	8.6	11.4	24.1	25.8	27.5	29.0	30.8	43.6	46.4	47.9	48 27.47	+ 0.11	−39.66	1 47 47.92	− 3.64
	Neptune	38	7.4	8.9	11.4	23.5	25.0	26.9	28.4	29.8	41.9	44.5	46.6	56 26.70	+ 0.07	−39.68	1 55 47.09	. .
	ξ^1 Ceti	39	46.3	48.6	50.2	3.6	4.1	5.9	7.4	9.6	21.0	23.6	25.2	7 5.85	+ 0.06	−39.71	2 6 26.20	− 3.68
	*+13° 2′	40	. .	. .	. .	28.6	30.1	31.8	33.6	35.2	. .	. .	. .	14 31.86	+ 0.09	−39.72	2 13 52.23	− 3.77
	B. A. C. 766	41	43.6	45.6	47.8	1.0	2.9	4.7	6.5	8.1	21.1	24.0	25.9	24 4.60	+ 0.14	−39.75	2 23 24.99	− 3.95
20	γ Andromedæ	42	. .	. .	. .	38.5	41.9	44.0	58.4	1.8	3.8	6.0	8.7	43 55.39	− 36.16	−20.75	0 42 58.48	− 3.00
	*+1° 54″	43	. .	. .	. .	. .	. .	. .	51.7	54.5	56.4	58.1	1.1	52 56.36	− 34.18	−20.76	0 52 1.42	− 3.23
	ε Piscium	42	32.2	33.6	36.0	48.1	49.5	51.3	53.1	54.5	6.5	9.1	10.8	56 51.34	+ 0.09	−20.76	0 56 30.67	− 3.24
	B. A. C. 326	45	. .	. .	. .	7.2	9.1	11.2	13.1	15.0	. .	. .	. .	2 11.12	− 0.24	−20.76	1 1 50.12	− 3.51
	B. A. C. 355	46	18.4	19.9	22.9	37.0	38.7	40.8	42.9	44.5	. .	. .	. .	5 33.14	+ 7.47	−20.77	1 5 19.84	− 3.52
	Polaris	47	. .	. .	. .	59.0	5.0	16.0	27.0	31.0	. .	. .	. .	13 15.60	+ 20.11	−20.77	. . . .	− 15.80
	B. A. C. 445	48	. .	. .	. .	. .	. .	. .	54.5	57.6	59.2	1.3	3.4	23 59.20	− 39.93	−20.78	1 22 58.49	− 3.55
	Weisse 432	49	25.5	27.1	29.6	41.6	43.2	44.8	46.2	47.7	. .	. .	. .	26 38.21	+ 6.47	−20.78	1 26 23.90	− 3.43
	*−2° 18	50	21.6	23.1	25.6	37.5	38.9	40.8	42.4	44.0	55.8	58.2	0.0	27 40.72	− 0.01	−20.78	1 27 19.93	− 3.44

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1875. h.	s.	s.	s.	s.
Dec. 17, 1.6	− 39.64	− 0.134	+ 0.22	+ 0.03
20, 3.0	− 20.85	− 0.044	+ 0.44	+ 0.03

Date and Observer.	OBJECT.	Number.	SECONDS OF TRANSIT. I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	CORRECTIONS. Inst.	Clock.	Observed R. Ascension.	Reduct'n to 1875.0.
1875.														m. s.	s.	s.	h. m. s.	s.
Dec. 20	* + 3° 26′ . . .	1	39.3	40.8	43.2	55.3	56.8	58.2	59.9	1.7	12.8	15.3	17.0	31 58.21	+ 0.06	−20.78	1 31 37.49	− 3.46
Y.	B. A. C. 575 . .	2	. .	. .	. .	6.6	10.0	12.3	26.5	29.8	31.8	34.1	36.7	48 23.48	− 36.00	−20.80	1 47 26.68	− 3.79
	Weisse 1069 . .	3	50.2	51.8	54.1	6.2	7.6	9.2	10.9	13.4	24.4	26.9	28.7	1 9.40	− 0.01	−20.80	2 0 48.59	− 3.60
	64 Ceti.	4	50.2	51.8	54.2	6.3	7.9	9.6	11.3	12.8	24.8	27.4	29.0	5 9.57	+ 0.09	−20.81	2 4 48.85	− 3.66
	Weisse 102 . .	5	32.5	34.1	36.5	48.5	50.1	51.8	53.3	55.0	6.9	9.4	11.1	8 51.75	+ 0.06	−20.81	2 8 31.00	− 3.67
	Weisse 186 . .	6	24.1	25.6	28.2	40.3	41.8	43.6	45.1	46.6	58.9	1.5	3.0	13 43.52	− 0.06	−20.81	2 13 22.65	− 3.65
	O. Arg. S. 1558 .	7	39.3	40.9	43.5	57.8	58.3	0.0	1.5	3.5	. .	. .	. .	20 53.10	+ 6.95	−20.82	2 20 39.23	− 3.67
	Lacaille 767 . .	8	58.5	0.0	2.7	17.3	19.2	21.3	23.2	24.9	39.6	42.4	44.6	25 21.25	− 0.26	−20.82	2 25 0.17	− 3.71
	Weisse (2) 727 .	9	24.3	25.9	28.6	41.9	43.4	45.3	47.0	48.9	2.2	4.8	6.7	31 45.36	+ 0.25	−20.83	2 31 24.78	− 4.01
	γ Ceti	10	54.9	56.6	58.9	10.8	12.4	14.1	15.7	17.2	29.1	31.7	33.5	37 14.08	+ 0.05	−20.83	2 36 53.30	− 3.79
	* + 37° 6′ . .	11	7.8	9.6	12.7	27.7	29.6	31.7	33.8	35.7	50.5	53.7	55.9	58 31.70	+ 0.37	−20.85	2 58 11.22	− 4.49
	* + 38° 27′ . .	12	5.3	7.1	10.4	. .	. .	. .	. .	. .	48.8	52 3	54.3	5 29.70	+ 0.38	−20.85	3 5 9.23	− 4.60
	* + 38° 27′ . .	13	22.5	24.2	27.2	. .	. .	. .	. .	. .	6.0	9.0	11.2	5 46.68	+ 0.38	−20.85	3 5 26.21	− 4.60
	Weisse (2) 209 .	14	4.6	5.9	8.5	. .	. .	. .	. .	. .	42.0	44.5	46.1	11 25.27	+ 0.22	−20.86	3 11 4.63	− 4.27
	* + 24° 58′ . .	15	23.9	25.4	27.9	. .	. .	. .	. .	. .	1.7	4.3	6.4	16 44.93	+ 0.23	−20.86	3 16 24.30	− 4.33
	* + 5° 26′ . .	16	37.7	39.4	41.3	42.8	45.3	. .	45.9	48.3	50.0	51.8	53.7	23 15.62	0.00	−20.87	3 22 54.75	− 4.04
	* + 5° 29′ . .	17	. .	. .	. .	21.3	22.8	24.5	26.0	27.7	. .	. .	. .	23 24.46	+ 0.08	−20.87	3 23 3.67	− 4.04
	* + 31° 17′ . .	18	38.5	40.1	42.8	56.9	58.7	0.6	2.4	4.3	17.9	21.2	23.1	28 0.59	+ 0.30	−20.87	3 27 40.02	− 4.57
	B. A. C. 1130 . .	19	38.9	40.5	43.2	56.9	58.4	0.5	2.3	4.1	17.7	20.4	22.3	34 0.47	− 0.20	−20.87	3 33 39 40	− 3.80
	16 Tauri	20	26.7	28.5	31.1	. .	. .	. .	. .	. .	4.1	6.9	8.7	37 47.67	+ 0.22	−20.88	3 37 27.01	− 4.44
	* + 23° 52′ . .	21	45.0	46.7	49.4	. .	. .	. .	. .	. .	22.5	25.3	27.0	38 5.98	+ 0.22	−20.88	3 37 45.32	− 4.44
	τ⁶ Eridani. . . .	22	32.1	33.9	36.6	49.5	51.4	53.1	54.7	56.4	9.4	12.2	14.2	41 53.05	− 0.16	−20.88	3 41 32.01	− 3.83
	Lalande 7206 . .	23	27.8	29.5	32.5	47.0	48.7	50 9	53.0	55.0	9.2	12.4	1 .4	48 50.95	+ 0.34	−20.89	3 48 30.40	− 4.84
	γ Eridani. . . .	24	16.9	18.5	21.1	33.2	35.0	36.6	38.3	40 0	52.3	54.9	56.6	52 36.67	− 0.08	−20.89	3 52 15.70	− 3.92
	* + 21° 43′ . .	25	1.8	3.6	6.2	19.1	20.7	22.5	24.4	26.1	38.8	41.5	43.2	58 22.54	+ 0.21	−20.89	3 58 1.86	− 4.50
	O. Arg. S. 2803 .	26	54.6	56.2	58.7	. .	13.5	15.1	17.0	. .	31.7	34.3	35.9	1 15.22	− 0.16	−20.89	4 0 54.17	− 3.85
	B. A. C. 1307 . .	27	47.6	49.6	53.6	11.9	14.5	17.1	19.4	21.9	40.3	44.2	46.8	10 16.99	+ 0.57	−20.90	4 9 56.66	− 5.81
	α Tauri	28	50.4	52.1	54.5	7.0	8.6	10.3	12.0	13.5	26.0	28.6	30.3	29 10.30	+ 0.16	−20.92	4 28 49.54	− 4.50
22	ω Piscium . . .	29	. .	. .	. .	14.4	15.9	17.8	19.2	20.8	32.8	35.4	37.1	53 24.18	− 6.45	−21.26	23 52 56.47	− 2.81
	γ Pegasi	30	52.3	53.8	56.4	8.6	10.3	12.0	13.7	15.4	27.7	30.2	32.0	7 12.04	+ 0.09	−21.27	0 6 50.86	− 2.82
	Weisse 305 . .	31	. .	. .	. .	. .	. .	. .	25.2	27.9	29.6	31.3	33.1	20 29.42	− 34.21	−21.28	0 19 33.93	− 3.00
	* + 38° 16′. . .	32	16.3	18.7	20.9	22.9	26.3	. .	42.9	46.2	48.1	50.4	52.5	25 4.52	+ 0.14	−21.28	0 24 43.38	− 2.76
	Lalande 713 . .	33	43.8	45.7	49.0	4.2	6.2	8.3	10.4	12.3	27.2	30.6	32.7	25 8.22	+ 0.23	−21.28	0 24 47.17	− 2.76
	Weisse 832 . .	34	54.1	55.6	58.7	11.8	13.7	15.5	17.4	19.1	32.3	35.1	36.8	33 15.46	+ 0.15	−21.29	0 32 54.32	− 2.94
	* − 1° 53′ . . .	35	26.4	27.9	30.5	42.1	43.8	45.6	47.2	48.8	0.5	3.3	4.8	39 45.54	+ 0.02	−21.29	0 39 24.27	− 3.16
	Lalande 1504 . .	36	19.8	22.1	24.2	26.2	29.6	. .	46.4	49.3	51.5	53.7	56.1	48 7.89	+ 0.14	−21.30	0 47 46.73	− 3.03
	* + 38° 30′. . .	37	43.4	45.3	48.3	3.9	5.8	7.8	9.7	11.5	27.0	30.4	32.7	48 7.80	+ 0.23	−21.30	0 47 46.73	− 3.03
	* + 1° 5′. . .	38	3.7	5.1	7.1	19.2	20.8	22.5	24.1	25.7	. .	. .	. .	52 16.02	+ 6.52	−21.30	0 52 1.24	− 3.21
	Weisse 88 . . .	39	29.4	31.3	32.9	34.4	37.0	. .	. .	. .	. .	. .	. .	7 33.00	+ 39.11	−21.31	1 7 45.80	− 3.32
	Weisse 91 . . .	40	57.9	59.3	1.7	13.7	15.4	17.0	18.5	20.0	32.0	34.4	36.2	8 16.92	+ 0.02	−21.31	1 7 55.63	− 3.32
	Polaris	41	. .	. .	. .	6.0	13.0	24.0	34.0	39.0	. .	. .	. .	13 23.20	+ 12.41	−21.32	. . . .	− 14.25
	* − 32° 28′. . .	42	. .	. .	. .	16.4	18.0	20.0	21.8	23.7	. .	. .	. .	19 19.98	− 0.11	−21.32	1 18 58.65	− 3.53
	Weisse 432 . .	43	. .	. .	. .	42.2	43.4	44.8	46.1	47.8	0.5	2.9	4.4	26 51.51	− 6.46	−21.33	1 26 23.72	− 3.42
	τ Andromedæ . .	44	12.2	14.0	17.4	32.8	35.0	37.0	39.0	41.2	56.7	0.0	2.1	33 37.04	+ 0.24	−21.34	1 33 15.94	− 3.60
	ο Piscium . . .	45	53.1	54.6	57.1	9.2	10.7	12 6	14.3	15.6	27.7	30.2	31.9	39 12.45	+ 0.07	−21.34	1 38 51.18	− 3.50
	* + 36° 40′. . .	46	38.3	40.8	42.7	44.6	48.1	. .	3.3	6 4	9.3	0.6	12.9	45 55.70	+ 0.13	−21.35	1 45 34.48	− 3.64
	* + 36° 35′. . .	47	. .	. .	. .	32.2	35.5	37.4	51.1	54.3	56.3	58.3	1.0	46 48.26	− 34.47	−21.35	1 45 52.44	− 3.71
	Weisse 1069 . .	48	50.7	52.1	54.5	6.7	8.2	9.8	11.4	12.9	24.9	27.0	29.0	1 9.80	+ 0.01	−21.36	2 0 48.44	− 3.59
	O. Arg. S. 1354 .	49	10.9	12.7	15.5	29.2	30.9	32.9	34.9	36.6	50.3	53.4	55.0	4 32.94	− 0.10	−21.36	2 4 11.48	− 3.62

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	*n*	*c*
1875. h.	s.	s.	s.	s.
Dec. 22, 2.7	− 21.39	− 0.048	+ 0.24	+ 0.03

Date and Observer.	OBJECT.	Number.	SECONDS OF TRANSIT.												CORRECTIONS.		Observed R. Ascension.	Reduct'n to 1875.0.
			I.	II.	III.	IV.	V.	VI.	VII.	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
														m. s.	s.	s.	h. m. s.	s.
1875. Dec. 22 Y.	Weisse 102	1	33.2	34.7	37.0	49.2	50.8	52.4	53.9	55.6	7.5	10.1	11.6	8 52.36	+ 0.05	−21.36	2 8 31.05	− 3.66
	Weisse 186	2	5.8	7.4	9.3	10.8	13.5	. .	15.1	17.4	18.9	20.7	22.8	13 44.17	− 0 09	−21.37	2 13 22.71	− 3.63
	Lacaille 749	3	46.6	48.3	51.4	5.7	7.5	9.3	11.4	13.3	27.9	30.9	32.8	23 9.55	− 0.13	−21.37	2 22 48.05	− 3.68
	B. A. C. 793	4	19.7	21.2	23.7	35.7	37.2	39.0	40.5	42.1	54.0	56.6	58.1	29 38.89	+ 0.06	−21.38	2 29 17.57	− 3.78
	Weisse 881	5	49.6	51.2	54.2	6.3	7.6	9.3	10.8	12.7	25.0	27.6	29.2	52 9.40	+ 0.10	−21.40	2 51 48.10	− 3.99
	*+38° 27'	6	. .	. .	. .	21.9	24.0	26.2	28.0	30.0	. .	. .	. .	5 26.02	+ 0.24	−21.41	3 5 4.85	− 4.59
	Weisse 58	7	42.2	44.5	46.5	48.5	52.0	. .	8.9	12.3	14.1	16.4	18.6	5 30.40	+ 0.14	−21.41	3 5 9.13	− 4.59
	Weisse 67	8	59.3	1.6	3.7	5.7	9.1	. .	26.0	29.2	31.2	33.4	35.9	5 47.51	+ 0.14	−21.41	3 5 26.24	− 4.59
	Lacaille 1124	9	37.0	38.4	41.3	54.6	56.5	58.4	0.2	1.9	15.0	17.7	19.6	27 58.24	− 0.08	−21.43	3 27 36.73	− 3.79
	16 Tauri	10	27.4	28.8	31.7	44.7	46.4	48.3	50.0	51.8	4.7	7.4	9.4	37 48.24	+ 0.14	−21.44	3 37 26.94	− 4.44
	*+23° 52'	11	. .	. .	. .	22.9	25.7	27.6	49.7	52.4	53.9	55.8	58.0	38 43.25	− 30.32	−21.44	3 37 51.49	− 4.44
	23 Pleiadum	12	6.9	8.8	11.3	24.5	26.2	28.1	30.0	31.5	44.5	47.3	48.9	40 28.00	+ 0.14	−21.44	3 40 6.70	− 4.44
	*+35° 35'	13	39.7	41.5	44.6	59.3	1.3	3.0	5.0	7.2	21.7	24.9	27.0	49 3.20	+ 0.21	−21.44	3 48 41.97	− 4.87
	*+35° 35'	14	. .	. .	. .	53.9	55.5	57.5	59.3	1.1	. .	. .	. .	49 57.46	+ 0.22	−21.44	3 49 36.24	− 4.88
	γ^1 Eridani	15	17.4	19.2	21.7	33.8	35.5	37.2	38.8	40.5	52.8	55.4	57.0	52 37.21	− 0.03	−21.44	3 52 15.74	− 3.92
	*+21° 43'	16	42.4	44.3	46.1	47.9	50.9	. .	55.5	58.1	0.0	1.8	3.7	58 23.07	+ 0.05	−21.45	3 58 1.67	− 4.51
	B. A. C. 1307	17	48.4	50.5	54.2	12.7	15.1	17.5	19.8	22.4	41.1	44.9	47.5	10 17.65	+ 0.33	−21.46	4 9 56.52	− 5.81
	+33° 50'	18	58.4	0.7	2.6	4.5	7.5	. .	20.3	23.4	25.4	27.3	29.6	16 43.97	+ 0.12	−21.47	4 16 22.62	− 5.00
	55 Persei	19	25.7	27.5	30.6	45.0	47.0	48.8	50.8	52.7	7.0	10.0	12.1	16 48.84	+ 0.20	−21.47	4 16 27.57	− 4.99
	ε Tauri	20	24.8	26.4	29.0	41.6	43.3	45.1	46.9	48.2	1.0	3.7	5.4	21 45.04	+ 0.11	−21.47	4 21 23.68	− 4.55
	*+35° 35'	21	50.5	52.2	55.5	10.0	11.7	14.0	16.0	17.7	32.5	35.4	37.6	25 13.92	+ 0.21	−21.47	4 24 52.66	− 5.12
	*+27° 0'	22	6.0	7.6	10.2	23.7	25.4	27.2	29.1	30.9	44.4	46.6	48.5	29 27.24	+ 0.16	−21.48	4 29 5.92	− 4.82
	*+38° 8'	23	. .	. .	. .	31.3	33.5	35.7	37.7	39.7	. .	. .	. .	34 55.58	+ 0.24	−21.48	4 34 14.34	− 5.30
	*+38° 11'	24	58.5	1.0	3.4	5.2	8.7	. .	25.1	28.5	30.4	32.5	35.1	34 46.84	+ 0.14	−21.48	4 34 25.50	− 5.31
	π^1 Orionis	25	9.9	11.4	13.9	25.8	27.5	29.2	30.9	32.3	44.3	47.0	48.6	43 29.16	+ 0.06	−21.49	4 43 7.73	− 4.34
	Weisse 1105	26	43.9	45.3	47.8	59.7	1.3	2.9	4.5	6.2	18.0	20.5	22.2	52 2.94	+ 0.04	−21.49	4 51 41.49	− 4.26
	Weisse 111	27	19.2	21.0	23.7	37.7	39.5	41.4	43.2	45.1	59.0	1.8	3.7	6 41.39	+ 0.17	−21.50	5 6 20.06	− 5.11
	*+38° 58'	28	47.7	50.1	52.5	54.3	57.9	. .	15.2	18.4	20.5	22.7	25.3	19 36.46	+ 0.14	−21.52	5 19 15.08	− 5.59
	*+38° 58'	29	7.0	9.7	11.7	13.3	16.6	. .	35.0	38.2	40.2	42.2	44.5	19 55.84	+ 0.14	−21.52	5 19 34.46	− 5.59
	Lalande 10621	30	58.9	0.9	3.9	19.4	21.1	23.2	25.2	27.3	42.6	45.9	47.8	33 23.29	+ 0.23	−21.53	5 33 1.99	− 5.59
	Weisse 1034	31	19.0	20.5	22.5	35.0	36.5	38.0	39.9	41.4	53.7	56.2	58.2	42 38.26	+ 0.07	−21.53	5 42 16.80	− 4.52
	*+66° 53'	32	32.1	36.2	42.3	12.8	17.1	21.3	25.6	29.4	59.3	5.9	10.3	48 21.12	+ 0.64	−21.54	5 48 0.22	− 9.31
	δ Ursæ Minoris, S. P.	33	. .	. .	. .	. .	53.0	22.0	51.0	. .	. .	. .	. .	12 22.00	− 2.08	−21.56	. . . .	+ 42.03
	γ Geminorum	34	35.6	37.3	40.0	52.4	54.0	55.9	57.6	59.1	11.5	14.1	15.9	30 55.76	+ 0.10	−21.57	6 30 34.29	− 4.75
27	β Ceti	35	22.6	24.2	27.0	39.5	41.0	43.0	44.7	46.3	58.8	1.6	3.2	37 42.90	− 0.06	−20.78	0 37 22.06	− 3.23
	γ Andromedæ	36	. .	. .	. .	14.7	16.7	18.9	21.1	23.1	. .	. .	. .	43 18.90	+ 0.28	−20.78	0 42 58.40	− 2.90
	Lalande 1504 (1st *)	37	42.6	44.6	47.7	3.2	5.2	7.0	9.0	11.1	26.6	29.7	31.9	48 7.15	+ 0.25	−20.78	0 47 46.62	− 2.97
	Lalande 1504 (2d *)	38	19.0	21.5	23.6	25.5	29.0	. .	45.8	49.0	51.0	53.4	55.9	48 7.37	+ 0.16	−20.78	0 47 46.75	− 2.97
	*+1° 54'	39	2.6	4.4	6.9	. .	. .	. .	. .	. .	36.6	39.1	41.4	52 21.83	+ 0.03	−20.78	0 52 1.08	− 3.17
	ε Piscium	40	32.0	33.5	35.9	48.0	49.7	51.4	53.0	54.5	6.5	9.1	10.7	56 51.30	+ 0.06	−20.78	0 56 30.58	− 3.17
	34 Ceti	41	26.8	28.3	30.9	42.7	44.4	46.2	47.9	49.3	1.1	3.7	5.3	5 46.06	+ 0.02	−20.78	1 5 25.30	− 3.26
	Weisse 88	42	47.4	48.9	51.3	. .	. .	. .	. .	. .	21.6	24.3	25.8	8 6.65	+ 0.01	−20.76	1 7 45.90	− 3.27
	Weisse 91	43	57.4	58.7	1.2	. .	. .	. .	. .	. .	31.5	34.0	35.6	8 16.40	+ 0.01	−20.78	1 7 55.63	− 3.27
	Polaris	44	. .	. .	. .	2.0	9.0	19.0	29.0	33.0	. .	. .	. .	13 18.40	+ 13.01	−20.78	. . . .	− 10.45
	B. A. C. 445	45	. .	. .	. .	15.5	17.0	19.0	21.0	22.9	36.7	39.5	41.6	23 26.65	− 7.64	−20.78	1 22 58.23	− 3.45
	*+2° 54'	46	11.4	12.8	15.4	27.3	28.8	30.5	32.2	33.5	45.6	48.2	49.8	33 30.50	+ 0.04	−20.78	1 33 9.76	− 3.41
	*+0° 21'	47	. .	. .	. .	56.7	58.2	0.1	1.5	3.0	15.0	17.5	18.9	41 6.36	− 6.47	−20.78	1 40 39.11	− 3.44
	Weisse 778	48	36.3	37.7	40.1	52.1	53.7	55.2	57.0	58.7	10.6	12.9	14.7	44 55.36	+ 0.04	−20.78	1 44 34.62	− 3.48
	B. A. C. 575	49	22.0	24.0	27.3	42.8	44.9	47.0	49.2	51.2	6.7	10.1	12.2	47 47.04	+ 0.27	−20.78	1 47 26.53	− 3.71
	Neptune	50	. .	. .	. .	58.3	0.9	2.6	13.8	16.3	17.8	19.6	21.5	56 11.35	− 28.20	−20.78	1 55 22.37	. .

December 29. Image west 0r.32 ; clamp east.
Image west 0r.42 ; clamp west.

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	n	c
1875. h.	s.	s.	s.	s.
Dec. 27, 2.8	− 20.78	− 0.002	+ 0.27	+ 0.03

Date and Observer.	OBJECT.	Number.	SECONDS OF TRANSIT.												CORRECTIONS.		Observed R. Ascension.	Reduct'n to 1875.0.
			I.	II.	III.	IV.	V.	VI.	VII	VIII	IX.	X.	XI.	Mean wire.	Inst.	Clock.		
1875.														m. s.	s.	s.	h. m. s.	s.
Dec. 27 Y.	O. Arg. N. 2484	1	5.3	7.7	11.8	31.2	33.8	36.5	39.0	41.8	1.0	5.4	8.1	5 36.51	+ 0.40	−20.78	2 5 16.13	− 4.21
	Weisse 102	2	32.5	34.0	36.5	48.4	50.0	51.8	52.4	54.9	6.8	9.4	11.0	8 51.61	+ 0.05	−20.78	2 8 30.88	− 3.62
	* − 11° 8′	3	. .	. .	. .	26.7	28.3	30.1	32.0	33.8	. .	. .	. .	13 30.18	− 0.01	−20.78	2 13 9.39	− 3.59
	Weisse 186	4	4.9	7.0	8.7	10.2	12.9	. .	14.4	16.7	18.5	20.2	22.0	13 43.55	− 0.09	−20.78	2 13 22.68	− 3.59
	B. A. C. 793	5	18.9	20.4	23.0	35.0	36.7	38.3	39.9	41.4	53.5	55.9	57.6	29 38.24	+ 0.06	−20.78	2 29 17.52	− 3.75
	γ Ceti	6	54.9	56.3	58.8	10.7	12.4	14.1	15.5	17.1	29.0	31.7	33.2	36 13.97	+ 0.04	−20.78	2 36 53.23	− 3.75
	α Ceti	7	50.2	51.8	54.3	6.2	7.7	9.5	10.1	12.7	24.6	27.2	28.8	56 9.37	+ 0.05	−20.78	2 55 48.64	− 3.88
	* + 38° 28′	8	. .	. .	. .	21.5	23.4	25.4	27.5	29.3	. .	. .	. .	5 25.42	+ 0.26	−20.78	3 5 4.90	− 4.56
	Weisse 58	9	5.2	7.3	10.4	. .	. .	. .	. .	. .	49.0	52.2	54.3	5 29.73	+ 0.24	−20.78	3 5 9.19	− 4.56
	Weisse 67	10	. .	. .	. .	6.1	9.2	11.4	25.4	28.6	30.5	32.7	35.0	6 22.36	− 35.34	−20.78	3 5 26.24	− 4.56
	* + 24° 58′	11	. .	. .	. .	41.3	42.9	44.8	46.4	48.2	. .	. .	. .	16 44.72	+ 0.17	−20.78	3 16 24.11	− 4.31
	66 Arietis	12	12.5	14.2	16.9	29.9	31.4	33.3	35.0	36.6	49.6	52.3	54.2	21 33.26	+ 0.14	−20.78	3 21 12.62	− 4.29
	* + 46° 50′	13	27.0	29.2	32.2	. .	. .	. .	. .	. .	16.1	20.6	23.5	25 54.77	+ 0.33	−20.78	3 25 34.32	− 5.12
	* + 46° 50′	14	55.3	57.4	1.0	. .	. .	. .	. .	. .	45.2	48.8	51.2	28 23.15	+ 0.33	−20.78	3 28 2.70	− 5.15
	* + 46° 50′	15	15.0	17.2	20.6	. .	. .	. .	. .	. .	4.8	8.8	11.0	28 42.90	+ 0.33	−20.78	3 28 22.45	− 5.16
	Weisse (2) 776	16	49.6	51.6	55.1	. .	. .	. .	. .	. .	37.8	41.6	43.5	37 16.53	+ 0.31	−20.78	3 36 56.06	− 5.16
	Weisse (2) 847	17	20.2	22.3	25.6	42.6	44.8	47.2	49.5	51.7	8.2	12.0	14.4	39 47.14	+ 0.32	−20.78	3 39 26.68	− 5.19
	Radcliffe 1084	18	41.0	43.0	46.2	2.0	3.9	6.2	8.5	10.5	25.9	29.3	31.5	44 6.18	+ 0.27	−20.78	3 43 45.67	− 5.02
	* + 35° 35′	19	39.1	41.0	44.0	58.8	0.7	2.5	4.7	6.4	21.2	24.2	26.3	49 2.63	+ 0.23	−20.78	3 48 42.08	− 4.87
	Weisse (2) 1143	20	38.0	39.8	42.5	57.3	59.0	1.2	3.3	5.3	. .	. .	. .	54 53.30	+ 8.14	−20.78	3 54 40.66	− 4.89
	A^2 Tauri	21	40.9	42.9	44.8	46.4	49.3	. .	53.8	56.9	58.6	0.3	2.4	58 21.63	+ 0.06	−20.78	3 58 0.91	− 4.51
	* + 21° 43′	22	1.7	3.4	6.1	18.9	20.6	22.5	24.2	25.8	38.7	41.3	43.3	58 22.41	+ 0.14	−20.78	3 58 1.77	− 4.51
	* + 44° 28′	23	. .	. .	. .	40.8	43.0	45.5	48.4	50.6	. .	. .	. .	6 45.66	+ 0.32	−20.78	4 6 25.20	− 5.43
	* + 44° 28′	24	22.8	24.8	28.0	. .	. .	. .	. .	. .	10.8	14.3	16.5	6 49.53	+ 0.30	−20.78	4 6 29.05	− 5.43
	51 Tauri	25	4.2	5.9	8.5	21.3	23.0	24.7	26.4	28.2	40.7	43.5	45.4	11 24.71	+ 0.14	−20.78	4 11 4.07	− 4.57
	Weisse (2) 344	26	22.8	24.6	27.1	39.5	41.0	42.9	44.5	46.1	58.7	1.3	3.0	17 42.86	+ 0.11	−20.78	4 17 22.19	− 4.48
	Lacaille 1463	27	55.7	57.4	0.3	14.6	16.7	18.5	20.5	22.3	36.6	39.4	41.4	23 18.49	− 0.14	−20.78	4 22 57.57	− 3.78
	B. A. C. 1404	28	. .	. .	. .	50.0	51.7	53.5	55.4	57.2	11.2	14.0	15.8	26 1.10	− 7.67	−20.78	4 25 32.65	− 3.80
	Weisse (2) 676	29	46.0	47.7	51.0	7.3	9.2	11.5	13.7	15.7	31.8	35.2	37.5	33 11.51	+ 0.29	−20.78	4 32 51.02	− 5.55
	Lacaille 1611	30	37.8	39.2	42.5	57.2	59.1	1.1	3.2	4.8	. .	. .	. .	44 53.11	+ 7.79	−20.78	4 44 40.12	− 3.77
	ι Aurigæ	31	54.4	56.2	59.1	13.2	15.0	17.0	19.1	21.0	35.1	38.0	40.1	49 17.11	+ 0.21	−20.78	4 48 56.54	− 5.18
	Weisse 1105	32	43.0	44.6	47.1	58.9	0.6	2.2	3.9	5.3	17.3	19.8	21.5	52 2.20	+ 0.04	−20.78	4 51 41.46	− 4.28
	11 Orionis	33	31.0	32.6	35.1	47.7	49.2	51.0	52.8	54.3	6.7	9.1	10.9	57 50.95	+ 0.11	−20.78	4 57 30.28	− 4.61

CORRECTIONS, &c.

Date.	Error of clock.	Hourly rate.	n	c
1875. h.	s.	s.	s.	s.

OBSERVATIONS

WITH THE

MURAL CIRCLE.

1875.

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. Jan. 5	1	ψ^2 Piscium	6.0	3	III–VII	38 50 2.8	5.1	10.8	7.0	11.1	3.9	6.78	33.136	−0.597	32.535
	2	40 Ceti	. .	3	III–VII	61 50 3.1	6.6	10.7	7.1	10.5	3.9	6.98	33.033	. .	32.437
	3	B. A. C. 445 . . .	8.0	3	V–IX	89 25 4.6	8.0	13.2	10.2	11.8	5.1	8.82	33.663	. .	33.078
	4	105 Piscium	. .	3	III–VII	43 9 55.8	58.5	63.4	59.8	63.2	oblit.	59.45	36.529	. .	35.929
	5	Lalande 3412. . .	7.5	3	III–VII	22 10 0.5	3.0	7.8	4.1	5.2	0.4	3.50	28.591	. .	27.987
	6	B. A. C. 643 . . .	5.5	3	·III, VII	88 45 4.3	9.9	12.9	10.8	12.2	6.0	9.35	30.827	. .	30.236
	7	η Arietis	. .	3	III–VII	38 14 57.8	59.6	67.1	61.0	65.2	58.9	61.60	29.088	. .	28.487
	8	70 Ceti	6.0	3	III–VII	60 19 55.6	57.8	65.2	61.8	62.3	56.6	59.88	30.464	. .	29.867
	9	Weisse II, 437 . .	7.8	3	III–VII	65 25 1.0	4.9	10.3	7.5	10.2	2.1	6.00	28.884	. .	28.288
	10	Weisse (2) II, 972 .	8.0	3	III–VII	34 5 2.8	6.3	12.7	9.8	9.0	4.2	7.47	27.264	. .	26.663
	11	47 Arietis	5.5	3	III–VII	38 45 7.0	11.2	17.7	14.7	16.4	8.8	12.63	34.438	. .	33.837
	12	Anon. 2^h 58^m 42^s .	8.5	3	III–VII	82 30 4.7	8.8	13.7	11.4	13.0	4.8	9.40	31.442	. .	30.849
	13	15 Eridani	5.0	3	III–VII	81 50 3.2	7.5	11.8	9.8	9.8	3.2	7.55	30.954	. .	30.361
	14	B. A. C. 1073 . .	6.0	3	III–VII	86 35 3.2	8.0	13.1	11.9	10.3	4.8	8.55	27.308	. .	26.716
	15	Lacaille 1196. . .	7.2	3	III–VII	90 15 5.2	10.7	15.1	11.4	12.4	5.7	10.08	29.249	. .	28.658
	16	Anon. 3^h 45^m 25^s .	7.0	3	III–VII	91 30 1.2	6.8	9.9	7.8	9.3	1.6	6.10	29.680	. .	29.089
	17	A^1 Tauri	5.0	3	III–VII	37 10 2.8	5.1	11.1	7.8	9.3	2.8	6.48	33.004	. .	32.403
	18	Rumker 1110 . .	7.0	3	III–VII	41 54 49.8	54.5	59.2	56.2	57.2	50.5	54.57	28.816	. .	28.216
	19	B. A. C. 1340 . .	. .	3	III–VII	84 9 57.8	62.7	68.2	66.0	65.7	58.1	63.08	28.460	. .	27.868
	20	Nadir	. .	.	. .	199 59 58.8	63.2	66.9	67.7	63.7	61.0	63.55	30.56:	. .	. .
11	21	Lacaille 444 . . .	7.0	3	III–VII	83 40 3.4	7.4	10.2	8.7	10.4	4.2	7.38	29.569	−0.589	28.984
	22	B. A. C. 527 . . .	6.0	3	V–IX	91 50 3.7	9.7	12.0	10.0	12.4	4.1	8.65	34.266	. .	33.691
	23	γ Arietis (2d *) . .	. .	2	I, IX	40 15 1.8	5.2	10.8	7.9	8.8	3.2	6.28	35.848	. .	35.243
	24	γ Arietis (1st *) . .	. .	3	IV–VI	" " "	"	"	"	"	"	"	36.136	. .	35.546
	25	B. A. C. 643 . . .	5.5	3	III–VII	88 45 6.0	10.4	12.0	12.2	14.2	7.9	10.45	30.890	. .	30.307
	26	20 Arietis	. .	3	III–VII	33 40 1.3	6.3	10.8	7.9	11.2	3.9	6.90	28.607	. .	28.013
	27	κ Fornacis	. .	3	III–VII	83 15 0.5	6.8	9.2	7.8	8.2	1.8	5.72	31.051	. .	30.466
	28	Weisse II, 437 . .	8.0	3	III–VII	65 25 1.7	5.2	8.7	6.8	10.1	1.6	5.68	28.803	. .	28.215
	29	Lacaille 816 . . .	7.0	3	III–VII	85 0 4.9	10.2	14.7	12.3	14.2	7.0	10.55	34.490	. .	33.906
	30	17 Persei	4.5	3	III–VII	24 20 1.2	6.7	10.8	9.1	10.8	2.8	6.90	29.403	. .	28.807
	31	B. A. C. 940 . . .	6.0	3	III–VII	84 40 2.4	6.3	12.1	9.3	10.8	4.8	7.62	34.362	. .	33.778
	32	Lacaille 988 . . .	7.0	3	III–VII	89 40 1.2	8.3	9.7	8.9	10.2	3.0	6.88	33.398	. .	32.815
	33	B. A. C. 1047 . .	6.5	3	III–VII	85 55 2.7	8.8	11.2	10.2	11.4	3.7	8.00	30.866	. .	30.282
	34	66 Arietis	6.2	3	III–VII	36 30 4.8	10.4	13.2	12.6	13.3	5.2	9.92	29.193	. .	28.600
	35	9 Tauri	7.5	3	III–VII	36 5 4.9	12.1	14.8	13.4	15.7	6.4	11.22	30.101	. .	29.508
	36	O. Arg. S. 2488 . .	8.6	3	V–IX	81 10 2.8	8.8	11.9	10.8	10.3	3.2	7.97	27.390	. .	26.810
	37	Anon. 3^h 45^m 22^s .	7.0	3	III–VII	91 29 58.8	64.8	66.7	66.1	67.2	58.9	63.75	29.533	. .	28.950
	38	A^2 Tauri	. .	3	III–VII	37 10 3.1	8.4	11.2	10.2	10.8	3.8	7.92	25.110	. .	24.517
	39	Rumker 1110 . .	6.0	3	III–VII	41 55 2.4	10.8	11.1	11.1	12.2	5.1	8.78	29.192	. .	28.600
	40	Lalande 7994 . .	6.5	3	V–IX	21 9 56.3	62.2	64.0	62.9	65.7	57.1	61.37	27.015	. .	26.410
	41	B. A. C. 1404 . .	. .	3	III–VII	89 35 1.2	7.3	9.6	7.9	8.7	1.2	5.98	32.875	. .	32.292
	42	υ^7 Eridani	5.0	3	III–VII	89 40 0.2	6.8	8.1	6.8	8.2	1.4	5.25	30.568	. .	29.985
	43	Anon. 4^h 42^m 9^s . .	8.0	3	III–VII	88 50 1.9	8.8	11.2	9.4	12.2	4.5	8.00	30.368	. .	29.785
	44	Nadir	. .	.	. .	199 59 58.9	64.0	67.1	67.1	65.6	60.2	63.82	30.558	. .	. .
14	45	56 Ceti	6.0	3	III–VII	82 0 1.8	4.8	7.0	4.1	8.4	3.1	4.87	30.427	−0.649	29.782
	46	B. A. C. 643 . . .	5.5	3	III–VII	88 45 1.8	5.1	7.1	4.7	8.6	3.0	5.05	30.609	. .	29.966
	47	20 Arietis	6.0	3	III–VII	33 40 4.2	7.9	11 9	8.8	12.4	5.3	8.42	28.719	. .	28.065
	48	κ Fornacis	5.5	3	III–VII	83 15 0.6	5.2	7.8	4.9	7.2	1.4	4.52	30.942	. .	30.297
	49	Weisse 437 . . .	8.0	3	III–VII	65 25 4.1	6.3	11.0	8.8	12.4	4.9	7.92	28.848	.	28.200
	50	Lacaille 816 . . .	. .	3	III–VII	84 59 59.1	61.5	67.0	63.0	67.8	59.9	63.05	34.221	. .	33.577
	51	Nadir	. .	.	. .	199 59 55.2	58.2	61.2	59.8	61.2	57.4	58.83	30.462	. .	. .
	52	Lacaille 1196. . .	. .	3	III–VII	90 15 3.8	8.5	10.1	8.0	11.3	4.8	7.75	29.038	. .	28.395
	53	Weisse (2) III, 1030.	8.3	3	III–VII	23 15 4.8	8.1	12.2	9.4	13.2	6.2	8.98	30.620	. .	29.964
	54	Weisse IV, 24 . .	8.5	3	III–VII	44 0 1.2	4.3	7.7	5.6	8.7	3.2	5.12	33.494	. .	32.842
	55	Anon. 4^h 8^m 20^s .	8.2	3	III–VII	90 30 5.4	10.4	13.7	10.2	13.3	5.3	9.72	36.550	. .	35.907
	56	Anon. 4^h 18^m 10^s .	7.8	3	III–VII	79 24 58.9	61.8	65.2	61.4	66.2	59.7	62.20	29.110	. .	28.465
	57	Anon. 4^h 25^m 52^s .	8.2	3	III–VII	43 20 6.8	12.1	14.2	10.9	14.2	oblit	10.97	31.055	. .	30.403
	58	Anon. 4^h 34^m 21^s .	6.0	3	III–VII	20 39 55.0	60.5	63.8	60.8	64.3	55.6	60.00	26.170	. .	25.513
	59	Anon. 4^h 42^m 8^s .	8.2	3	IV–VI	88 50 1.2	4.9	7.8	4.8	8.2	2.1	4.83	30.208	. .	29.561
	60	O. Arg. S. 3513 . .	8.0	3	III–VII	86 45 2.9	7.8	12.2	10.7	11.8	4.9	8.38	29.892	. .	29.248
	61	O. Arg. S. 3630 . .	8.5	3	III–VII	" " "	"	"	"	"	"	8.38	37.491	. .	36.847
	62	O. Arg. S. 3720 . .	3.5	3	III–VII	84 25 5.8	11.1	16.6	14.7	16.8	8.6	12.27	32.728	. .	32.084
	63	Anon. 5^h 19^m 11^s .	8.3	3	III–VII	19 50 3.9	9.8	13.2	10.7	12.6	4.2	9.07	31.141	. .	30.484
	64	Anon. 5^h 27^m 48^s .	8.3	3	III–VII	64 35 3.2	10.0	13.1	12.3	12.2	5.0	9.30	32.408	−0.649	31.760

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	30.280	35.8	29.7	− 1 19.5	S. 18 48 47.3	20.9	+ 20 4 30.6	− 5.2	Y.	
2	. .	. .	. .	− 1 16.4	41 48 50.6	54.9	− 2 56 6.7	+ 2.6	Y.	
3	30.290	35.3	29.4	− 1 36.5	69 23 32.4	2 42.0	− 30 32 35.6	+ 11.1	Y.	−1″.77 applied to mean of B, C, D, and E.
4	. .	. .	. .	− 3 5.8	23 6 53.6	26.2	+ 15 46 19.0	− 4.7	Y.	
5	. .	. .	. .	+ 1 3.1	2 11 6.6	2.3	+ 36 42 29.9	− 11.9	Y.	
6	30.303	34.7	28.4	− 7.4	68 45 1.9	2 37.0	− 29 54 0.1	+ 9.4	Y.	
7	. .	. .	. .	+ 47.4	18 15 49.0	20.4	+ 20 37 29.4	− 7.3	Y.	
8	. .	. .	. .	+ 4.1	40 20 4.0	52.3	− 1 27 17.5	− 0.2	Y.	
9	. .	. .	. .	+ 53.7	45 25 59.7	1 2.5	− 6 33 23.4	+ 1.0	Y.	
10	. .	. .	. .	+ 1 44.6	14 6 52.1	15.5	+ 24 46 31.2	− 9.4	Y.	
11	30.334	33.7	27.3	− 2 0.3	18 43 12.4	20.9	+ 20 10 5.5	− 8.1	Y.	
12	. .	. .	. .	− 26.6	62 29 42.8	1 58.2	− 23 38 2.2	+ 4.7	Y.	
13	. .	. .	. .	− 11.3	61 49 56.2	1 55.0	− 22 58 12.4	+ 3.9	Y.	
14	30.340	33.2	26.7	+ 1 42.9	66 36 51.5	2 22.2	− 27 45 34.9	+ 4.6	Y.	
15	. .	. .	. .	+ 42.1	70 15 52.1	2 51.1	− 31 25 4.4	+ 4.5	Y.	
16	30.350	32.5	26.1	+ 28.5	71 30 34.6	3 3.5	− 32 39 59.3	+ 4.3	Y.	
17	. .	. .	. .	− 1 15.3	17 8 51.1	19.1	+ 21 44 28.6	− 9.2	Y.	
18	. .	. .	. .	+ 55.9	21 55 50.5	25.0	+ 16 57 23.3	− 8.1	Y.	
19	30.366	32.0	25.5	+ 1 6.8	64 11 9.9	2 7.7	− 25 19 38.8	+ 1.3	Y.	
20	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
21	30.340	32.2	25.0	+ 31.8	63 40 39.2	2 4.9	− 24 49 5.3	+ 9.7	Y.	
22	. .	. .	. .	− 1 55.7	71 48 13.0	3 7.0	− 32 57 41.2	+ 11.6	Y.	
23	. .	. .	. .	− 2 44.3	20 12 22.0	22.9	+ 18 40 53.9	− 5.8	Y.	
24	. .	. .	. .	− 2 53.8	20 12 12.4	22.9	+ 18 41 3.5	− 5.8	Y.	
25	30.334	32.0	24.3	− 9.6	68 45 0.8	2 38.7	− 29 54 0.7	+ 9.9	Y.	
26	. .	. .	. .	+ 1 2.3	13 41 9.2	15.1	+ 25 12 14.5	− 8.7	Y.	
27	. .	. .	. .	− 14.6	63 14 51.1	2 2.8	− 24 23 15.1	+ 7.6	Y.	
28	. .	. .	. .	+ 55.9	45 26 1.6	1 3.0	− 6 33 25.8	+ 1.6	Y.	
29	30.330	30.5	24.4	− 2 2.4	64 58 8.1	2 12.4	− 26 6 41.7	+ 7.4	Y.	
30	. .	. .	. .	+ 37.4	4 20 44.3	4.7	+ 34 32 49.8	− 12.3	Y.	
31	. .	. .	. .	− 1 58.4	64 38 9.2	2 10.6	− 25 46 41.0	+ 6.4	Y.	
32	30.336	29.8	23.6	− 1 28.2	69 38 38.7	2 46.5	− 30 47 46.4	+ 7.3	Y.	
33	. .	. .	. .	− 8.8	65 54 59.2	2 18.6	− 27 3 39.0	+ 5.7	Y.	
34	. .	. .	. .	+ 43.9	16 30 53.8	18.5	+ 22 22 26.5	− 9.0	Y.	
35	. .	. .	. .	+ 15.4	16 5 26.6	18.0	+ 22 47 54.2	− 9.3	Y.	
36	. .	. .	. .	+ 1 40.0	61 11 47.9	1 53.1	− 22 20 2.2	+ 3.5	Y.	
37	30.330	28.8	22.1	+ 32.9	71 30 36.7	3 5.0	− 32 40 2.9	+ 5.5	Y.	
38	. .	. .	. .	+ 2 51.9	17 12 59.8	19.4	+ 21 40 19.6	− 9.1	Y.	
39	. .	. .	. .	+ 43.9	21 55 52.7	25.2	+ 16 57 20.9	− 7.8	Y.	
40	. .	. .	. .	+ 1 52.5	1 11 53.9	1.3	+ 37 41 43.6	− 13.1	Y.	
41	30.314	27.8	20.5	− 1 11.8	69 33 54.1	2 46.8	− 30 43 2.1	+ 3.0	Y.	
42	. .	. .	. .	+ 0.5	69 40 5.7	2 47.8	− 30 49 14.7	+ 2.7	Y.	
43	30.316	27.2	20.0	+ 6.8	68 50 14.8	2 40.8	− 29 59 16.8	+ 2.0	Y.	
44	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
45	30.130	36.2	31.3	+ 6.8	62 0 11.7	1 54.0	− 23 8 26.9	+ 8.3	Y.	
46	. .	. .	. .	+ 1.1	68 45 6.1	2 35.4	− 29 54 2.7	+ 10.0	Y.	
47	. .	. .	. .	+ 1 0.7	13 41 9.1	14.8	+ 25 12 14.9	− 8.6	Y.	
48	. .	. .	. .	− 9.3	63 14 55.2	2 0.5	− 24 23 16.9	+ 7.7	Y.	
49	30.130	36.0	29.6	+ 56.4	45 26 4.4	1 1.9	− 6 33 27.5	+ 1.7	Y.	
50	. .	. .	. .	− 1 52.1	64 58 10.9	2 10.2	− 26 6 42.3	+ 7.5	Y.	
51	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
52	30.106	35.4	29.0	+ 50.3	70 15 58.1	2 48.8	− 31 25 8.1	+ 5.9	Y.	
53	. .	. .	. .	+ 1.1	3 15 10.1	3.5	+ 35 38 25.2	− 13.0	Y.	
54	. .	. .	. .	− 1 29.1	23 58 36.1	27.2	+ 14 54 35.5	− 7.3	Y.	
55	30.112	34.5	28.2	− 3 5.1	70 27 4.6	2 50.8	− 31 36 16.6	+ 4.5	Y.	
56	. .	. .	. .	+ 48.1	59 25 50.3	1 40.3	− 20 33 51.8	+ 1.7	Y.	−1″.88 applied to mean of B, C, D, and E.
57	. .	. .	. .	− 12.6	23 19 58.4	26.4	+ 15 33 14.0	− 7.6	Y.	
58	. .	. .	. .	+ 2 20.6	0 42 20.6	0.8	+ 38 11 17.4	− 13.1	Y.	
59	30.118	33.0	28.3	+ 13.8	68 50 18.6	2 37.0	− 29 59 16.8	+ 2.5	Y.	
60	. .	. .	. .	+ 23.6	66 45 31.9	2 21.7	− 27 54 14.8	+ 1.7	Y.	
61	. .	. .	. .	− 3 34.6	66 41 33.8	2 21.3	− 27 50 16.3	+ 1.3	Y.	
62	. .	. .	. .	− 1 5.3	S. 64 24 7.0	2 7.2	− 25 32 35.4	+ 0.7	Y.	
63	. .	. .	. .	− 15.1	N. 0 10 6.1	0.2	+ 39 3 45.1	− 12.0	Y.	
64	30.124	32.2	27.8	− 55.2	S. 44 34 14.2	1 0.3	− 5 41 35.7	− 3.4	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. Jan. 16	1	O. Arg. S. 1655	. .	3	III–VII	76 45 1.9	6.5	11.4	9.8	10.3	2.7	7.10	35.692	−0.632	35.063
	2	μ Arietis	6.0	3	III–VII	39 25 7.8	13.6	17.2	16.1	18.3	10.2	13.87	32.023	. .	31.388
	3	41 Arietis	3.5	3	III–VII	32 10 1.7	6.7	9.8	8.9	10.2	3.7	6.83	33.448	. .	32.811
	4	4 Eridani	. .	3	III–VII	83 15 1.0	6.8	10.0	7.9	10.2	3.0	6.48	33.438	. .	32.810
	5	Lacaille 988	7.0	3	III–VII	89 40 3.9	8.8	11.6	10.0	11.7	4.9	8.48	33.370	. .	32.744
	6	B. A. C. 1047	. .	3	III–VII	85 55 3.7	8.5	12.8	11.6	12.6	4.2	8.90	30.828	. .	30.201
	7	B. A. C. 1073	6.0	3	III–VII	86 35 1.7	7.3	11.1	11.0	11.2	4.1	7.73	27.187	. .	26.560
	8	Anon. 3h 28m	7.0	3	V–IX	27 20 4.0	9.2	12.1	12.4	11.2	5.0	8.98	35.719	. .	35.074
	9	Anon. 3h 39m 10s	8.0	2	V, VII	35 40 7.6	10.7	15.7	14.0	15.2	7.5	11.78	32.588	. .	31.951
	10	B. A. C. 1273	5.0	3	III–VII	66 50 2.7	9.8	11.2	11.6	11.8	4.9	8.67	28.840	. .	28.213
	11	B. A. C. 1340	. .	3	III–VII	84 10 2.2	9.1	12.2	11.1	12.1	4.0	8.45	28.515	. .	27.888
	12	Nadir	. .	.	. .	200 0 1.6	6.8	8.7	9.2	7.2	3.4	6.15	30.680	. .	. .
22	13	O. Arg. S. 1655	8.0	3	III–VII	76 45 1.7	5.2	8.0	4.4	10.2	3.8	5.55	35.435	−0.552	34.886
	14	41 Arietis	. .	3	III–VII	32 10 4.4	7.3	10.2	6.7	13.2	6.7	8.08	33.370	. .	32.813
	15	Lacaille 922	6.5	3	III–VII	84 40 0.2	2.2	6.2	2.9	8.7	2.9	3.85	30.036	. .	29.489
	16	τ³ Eridani	5.0	3	IV–VI	82 59 57.2	60.8	63.9	60.7	67.2	58.4	61.37	32.915	. .	32.364
	17	3 Arietis	5.0	3	III–VII	38 20 1.8	4.1	8.2	3.8	11.4	4.9	5.70	33.795	. .	33.239
	18	11 Ursæ Minoris, S.P.	. .	3	IV–VI	311 15 0.3	0.2	5.7	59.6	8.3	1.3	2.57	35.582	. .	35.039
	19	Anon. 3h 27m 37s	8.5	3	III–VII	27 35 5.8	9.5	12.9	8.7	14.6	9.8	10.22	28.582	. .	28.024
	20	O. Arg. S. 2488	8.5	3	III–VII	81 10 0.7	5.0	7.8	3.8	9.2	2.9	4.90	27.018	. .	26.470
	21	Weisse (2) III, 1030.	8.3	3	III–VII	23 15 2.2	5.2	9.1	4.0	10.8	5.4	6.12	30.455	. .	29.896
	22	Anon. 3h 37m 59s	8.0	3	III–VII	37 10 4.2	7.8	10.8	7.4	13.7	8.1	8.67	30.423	. .	29.867
	23	Anon. 4h 6m 17s	8.5	2	I, IX	14 25 3.1	6.4	8.8	4.8	12.1	4.2	6.57	29.432	. .	28.832
	24	Lalande 7817	7.5	3	III–VII	" " "	"	"	"	"	"	"	27.788	. .	27.227
	25	55 Persei	5.0	3	III–VII	25 5 3.7	7.1	9.8	6.8	11.5	4.8	7.28	34.596	. .	34.038
	26	Anon. 4h 25m 58s	9.2	3	V–IX	30 25 1.6	4.7	7.5	3.4	11.2	5.2	5.60	29.925	. .	29.362
	27	Anon. 4h 35m 7s	7.5	3	III–VII	84 45 2.9	6.0	11.2	7.1	14.2	7.2	8.10	30.518	. .	29.971
	28	Anon. 4h 46m 50s	9.0	3	IV–VI	14 54 57.3	60.3	63.2	57.5	64.6	58.1	60.17	27.586	. .	27.031
	29	Anon. 4h 57m 33s	8.2	3	III–VII	14 20 4.1	7.3	10.2	5.4	11.8	4.7	7.25	30.834	. .	30.273
	30	B. A. C. 1615	. .	3	III–VII	89 15 4.2	9.7	11.0	6.9	13.0	7.9	8.78	33.037	. .	32.491
	31	Weisse (2) V, 430	. .	2	VII, IX	20 55 2.9	7.0	10.1	5.2	11.7	5.7	7.10	25.920	. .	25.343
	32	Anon. 5h 27m 48s	8.0	3	III–VII	64 34 59.7	62.4	65.8	62.7	69.2	61.1	63.48	32.078	. .	31.527
	33	Anon. 5h 35m 40s	9.0	3	III–VII	20 40 0.2	3.2	7.7	1.8	9.4	2.1	4.07	28.700	. .	28.140
	34	O. Arg. S. 4395	6.7	3	III–VII	84 50 1.9	5.2	9.8	6.4	12.2	6.1	6.93	30.484	. .	29.937
	35	Lacaille 2090.	8.0	3	IV–VI	93 14 58.2	61.1	61.8	60.1	64.8	60.6	61.10	35.270	. .	34.720
	36	Nadir	. .	.	. .	200 0 3.8	7.2	9.1	7.6	10.2	7.9	7.63	30.645	. .	. .
25	37	Anon. 2h 48m 30s	9.2	3	V–IX	50 50 2.4	7.2	10.8	7.9	12.3	6.4	7.83	22.941	−0.530	22.408
	38	ζ Arietis	5.0	3	III–VII	38 20 1.1	5.4	10.7	6.3	12.2	4.1	6.63	33.838	. .	33.304
	39	11 Ursæ Majoris, S.P.	. .	3	IV, VI, VII	311 15 2.3	5.1	10.3	6.0	11.4	3.6	6.45	35.621	. .	35.115
	40	Anon. 3h 27m 37s	8.5	3	V–IX	27 35 3.1	8.7	12.1	8.8	11.7	6.1	8.42	28.554	. .	28.011
	41	B. A. C. 1165	7.0	3	III–VII	35 0 2.2	8.0	11.1	8.3	11.2	4.3	7.52	32.287	. .	31.753
	42	Anon. 3h 40m 48s	8.2	3	V–IX	" " "	"	"	"	"	"	"	35.975	. .	35.436
	43	Lacaille 1291	7.0	3	IV–VI	88 54 58.2	63.9	67.1	61.5	67.8	60.1	63.10	35.257	. .	34.729
	44	Anon. 4h 2m 24s	9.0	3	III–VII	66 40 1.8	4.7	10.2	6.1	10.8	4.2	6.30	27.698	. .	27.169
	45	Weisse (2) IV, 137	7.5	3	III–VII	14 30 5.1	10.7	14.6	9.8	13.1	5.9	9.87	28.988	. .	28.449
	46	Anon. 4h 17m 17s	7.2	3	III–VII	42 20 1.2	7.2	10.1	5.8	11.2	4.9	6.73	35.825	. .	35.292
	47	Anon. 4h 26m 0s	9.5	3	III–VII	30 24 59.2	63.4	66.8	64.1	68.2	61.2	63.82	29.532	. .	28.997
	48	Anon. 4h 35m 9s	9.0	3	V–IX	84 45 1.2	5.1	10.8	7.2	9.4	3.2	6.15	30.256	. .	29.736
	49	O. Arg. S. 3513	8.2	3	III–VII	86 45 3.4	10.7	14.4	12.2	13.2	7.0	10.15	29.752	. .	29.227
	50	Anon. 5h 1m 43s	8.3	2	I, IX	29 14 54.7	60.6	64.2	62.0	65.4	57.9	60.80	29.304	. .	28.746
	51	Weisse (2) V, 1414	7.5	3	III–VII	" " "	"	"	"	"	"	"	30.239	. .	29.704
	52	Groombridge 980	6.5	3	III–VII	20 40 0.7	7.8	11.8	8.2	12.1	2.7	7.22	30.551	. .	30.013
	53	Anon. 5h 35m 29s	8.0	2	III, V	" " "	"	"	"	"	"	"	26.711	. .	26.175
	54	Anon. 5h 35m 40s	9.0	2	VII, IX	" " "	"	"	"	"	"	"	28.721	. .	28.266
	55	O. Arg. N. 6356	9.0	3	IV–VI	346 30 3.3	8.2	14.8	9.4	12.1	4.4	8.70	30.219	. .	29.680
	56	Nadir	. .	.	. .	200 0 2.8	8.2	11.4	10.2	9.8	4.5	7.82	30.629	. .	. .
Feb. 1	57	Anon. 3h 27m 35s.	8.8	3	V–IX	27 35 2.5	8.1	11.8	9.5	10.8	3.9	7.77	28.503	−0.606	27.884
	58	Anon. 3h 49m 36s.	7.5	3	III–VII	22 45 1.8	5.4	9.2	5.5	8.7	0.5	5.18	29.673	. .	29.060
	59	Anon. 4h 2m 24s.	9.0	3	III–VII	66 40 3.4	7.6	13.2	8.8	10.8	4.1	7.98	28.135	. .	27.530
	60	Anon. 4h 6m 16s.	8.5	3	V–IX	14 25 2.7	8.1	11.4	7.8	10.4	2.4	7.13	29.520	. .	28.893
	61	55 Persei	5.5	3	III–VII	25 5 0.8	5.2	8.9	6.5	5.8	59.5	4.45	34.515	. .	33.903
	62	Anon. 4h 25m 55s	9.0	3	III–VII	30 25 0.0	3.5	7.8	4.0	7.2	0.2	3.78	29.964	. .	29.353
	63	Anon. 4h 32m 38s	8.0	3	III–VII	85 55 0.8	5.7	10.2	6.2	8.6	1.0	5.42	33.941	. .	33.340
	64	Anon. 4h 54m 12s	8.2	3	III–VII	87 30 0.7	4.9	9.0	7.8	8.1	1.2	5.28	32.259	. .	31.685
	65	Anon. 5h 8m 49s	8.0	3	III–VII	28 40 0.5	6.0	9.8	7.3	9.2	1.2	5.67	32.563	−0.606	31.951

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	30.092	30.5	28.0	− 2 38.7	S. 56 42 28.4	1 33.0	− 17 50 22.6	+ 5.4	Y.	
2	. .	. .	. .	− 43.5	19 24 30.4	21.6	+ 19 28 46.8	− 7.3	Y.	
3	. .	. .	. .	− 1 28.1	12 8 38.7	13.2	+ 26 44 46.9	− 10.0	Y.	
4	30.100	30.5	28.3	− 1 28.1	63 13 38.4	2 0.7	− 24 22 0.3	+ 6.4	Y.	
5	. .	. .	. .	− 1 26.0	69 38 42.5	2 43.7	− 30 47 47.4	+ 7.6	Y.	
6	. .	. .	. .	− 6.3	65 55 2.6	2 16.2	− 27 3 40.0	+ 6.2	Y.	
7	. .	. .	. .	+ 1 47.8	66 36 55.5	2 20.8	− 27 45 37.5	+ 6.1	Y.	
8	. .	. .	. .	− 2 39.0	7 17 30.0	7.8	+ 31 36 1.0	− 12.0	Y.	
9	30.124	31.0	28.0	− 1 1.1	15 29 10.6	17.2	+ 23 14 11.0	− 9.6	Y.	
10	30.126	31.0	28.3	+ 56.0	66 51 4.7	2 22.4	− 27 59 48.3	+ 4.3	Y.	
11	. .	. .	. .	+ 1 6.2	64 11 14.6	2 6.0	− 25 19 41.8	+ 3.1	Y.	
12	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
13	29.994	38.8	42.2	− 2 33.1	56 42 32.4	1 30.0	− 17 50 23.6	+ 5.9	Y.	
14	. .	. .	. .	− 1 28.1	12 8 39.9	12.8	+ 26 44 46.1	− 9.7	Y.	
15	29.994	39.0	39.8	+ 16.0	64 40 19.8	2 5.1	− 25 48 46.1	+ 7.5	Y.	
16	. .	. .	. .	− 1 14.1	62 58 47.3	1 56.3	− 24 7 4.8	+ 6.7	Y.	
17	. .	. .	. .	− 1 41.5	S. 18 18 24.2	19.7	+ 20 34 54.9	− 8.1	Y.	
18	30.000	39.0	38.3	− 2 37.9	N. 68 47 35.4	2 32.8	+ 72 16 13.0	+ 25.1	Y.	
19	. .	. .	. .	+ 1 1.9	S. 7 36 12.2	8.0	+ 31 17 18.6	− 11.9	Y.	
20	. .	. .	. .	+ 1 50.7	61 11 55.6	1 48.3	− 22 50 5.1	+ 4.7	Y.	
21	. .	. .	. .	+ 3.3	3 15 9.4	3.4	+ 35 38 26.0	− 13.3	Y.	
22	. .	. .	. .	+ 4.1	S. 17 10 12.8	18.4	+ 21 43 7.6	− 9.1	Y.	
23	. .	. .	. .	+ 36.6	N. 5 34 16.8	5.8	+ 44 28 1.4	− 15.7	Y.	
24	30.024	39.2	41.0	+ 1 26.9	N. 5 33 26.5	5.8	+ 44 27 11.1	− 15.7	Y.	
25	. .	. .	. .	− 2 6.5	S. 5 3 0.8	5.3	+ 33 50 32.7	− 12.7	Y.	
26	. .	. .	. .	+ 20.0	10 25 25.6	11.0	+ 28 28 2.2	− 11.1	Y.	Faint.
27	30.040	39.5	40.4	+ 0.9	S. 64 45 9.0	2 5.6	− 25 53 35.8	+ 3.4	Y.	
28	. .	. .	. .	+ 33.0	N. 5 4 26.8	5.3	+ 43 58 10.9	− 14.9	Y.	
29	. .	. .	. .	− 8.6	N. 5 40 1.3	5.9	+ 44 33 46.0	− 14.7	Y.	
30	30.046	29.5	40.0	− 1 18.1	S. 69 13 50.7	2 35.9	− 30 22 47.8	+ 2.9	Y.	
31	. .	. .	. .	+ 2 25.9	0 57 33.0	1.0	+ 37 56 4.8	− 12.6	Y.	
32	. .	. .	. .	− 47.8	44 34 15.6	58.7	− 5 41 35.5	− 2.5	Y.	
33	. .	. .	. .	+ 58.3	0 41 2.3	0.7	+ 38 12 35.8	− 12.1	Y.	
34	30.066	39.8	40.3	+ 2.0	64 50 8.9	2 6.2	− 25 58 36.3	+ 0.6	Y.	
35	30.070	39.8	41.0	− 2 27.9	73 12 33.2	3 14.9	− 34 22 9.3	+ 1.3	Y.	
36	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
37	30.200	38.6	29.0	+ 3 57.9	30 54 5.7	36.7	+ 7 58 56.4	− 3.1	Y.	
38	. .	. .	. .	− 1 43.6	S. 18 18 23.1	20.3	+ 20 34 55.4	− 8.0	Y.	
39	30.200	38.0	29.4	− 2 40.3	N. 68 47 33.9	2 36.6	+ 72 16 10.7	+ 25.6	Y.	
40	. .	. .	. .	+ 1 2.3	S. 7 36 10.8	8.2	+ 31 17 19.8	− 11.9	Y.	
41	. .	. .	. .	− 54.9	14 59 12.6	16.3	+ 23 54 9.9	− 9.6	Y.	
42	30.194	37.4	31.9	− 2 50.4	14 57 17.2	16.3	+ 23 56 5.3	− 9.6	Y.	
43	. .	. .	. .	− 2 28.2	68 52 34.9	2 36.6	− 30 1 32.7	+ 6.5	Y.	
44	. .	. .	. .	+ 1 28.7	S. 46 41 35.0	1 4.7	− 7 49 0.9	+ 0.2	Y.	Preceded by a smaller star.
45	. .	. .	. .	+ 48.6	N. 5 29 1.5	5.9	+ 44 22 46.2	− 15.8	Y.	
46	. .	. .	. .	− 2 45.9	S. 22 17 20.9	25.1	+ 16 35 52.8	− 7.5	Y.	Saw but one.
47	30.210	36.8	29.4	+ 31.4	10 25 35.3	11.3	+ 28 27 52.2	− 11.1	Y.	Faint.
48	. .	. .	. .	+ 8.3	64 45 14.4	2 9.1	− 25 53 44.7	+ 3.9	Y.	
49	30.204	36.2	30.0	+ 24.2	66 45 34.4	2 21.6	− 27 54 17.2	+ 3.7	Y.	
50	. .	. .	. .	+ 39.3	9 15 40.1	10.0	+ 29 37 48.7	− 11.0	Y.	
51	. .	. .	. .	+ 9.3	9 15 10.1	10.0	+ 29 38 18.7	− 11.0	Y.	
52	. .	. .	. .	− 0.4	0 40 6.8	0.7	+ 38 13 31.3	− 12.7	Y.	
53	. .	. .	. .	+ 1 59.9	0 42 7.1	0.8	+ 38 11 30.9	− 12.2	Y.	
54	. .	. .	. .	+ 54.4	S. 0 41 1.6	0.7	+ 38 12 36.5	− 12.3	Y.	
55	30.210	35.0	28.5	+ 10.0	N. 33 29 41.3	40.6	+ 72 24 0.7	− 17.9	Y.	
56	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
57	30.176	36.8	28.0	+ 1 6.3	S. 7 36 14.0	8.2	+ 31 17 16.6	− 12.0	Y.	
58	. .	. .	. .	+ 29.4	2 45 34.6	3.0	+ 36 8 1.2	− 13.8	Y.	
59	. .	. .	. .	+ 1 17.4	S. 46 41 25.4	1 5.3	− 7 48 51.9	+ 0.6	Y.	Saw but one.
60	30.188	36.2	26.8	+ 34.7	N. 5 34 18.2	6.0	+ 44 28 3 0	− 16.4	Y.	
61	. .	. .	. .	− 2 2.3	S. 5 3 2.1	5.4	+ 33 50 31.3	− 13.1	Y.	
62	. .	. .	. .	+ 20.3	10 25 24.1	11.3	+ 28 28 3.4	− 11.4	Y.	
63	. .	. .	26.8	− 1 44.7	65 53 20.7	2 16.8	− 27 1 58.7	+ 4.9	Y.	
64	30.188	35.5	26.2	− 52.0	67 29 13.3	2 27.7	− 28 38 2.2	+ 4.7	Y.	
65	. .	. .	. .	− 1 1.1	S. 8 39 4.5	9.4	+ 30 14 24.9	− 11.5	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. Feb. 1	1	Anon. $5^h 19^m 9^s$ . .	8.8	3	III–VII	19 50 5.2	10.4	15.2	13.0	13.8	4.6	10.37	30.889	– 0.606	30.275
	2	Groombridge 990 .	7.5	3	IV–VI	7 30 1.3	6.3	12.1	7.7	10.2	1.1	6.45	27.090	. .	26.480
	3	O. Arg. S. 4213 . .	6.5	3	III–VII	88 40 2.8	9.3	13.1	9.4	11.2	3.8	8.27	34.102	. .	33.502
	4	Anon. $5^h 48^m 37^s$.	8.3	1	V	346 25 2.2	7.2	13.7	7.8	9.0	2.0	6.98	26.182	. .	25.576
	5	Anon. $5^h 56^m 6^s$.	8.8	3	V–IX	32 30 2.9	7.8	13 2	10.7	11.2	3.9	8.28	26.801	. .	26.185
	6	Anon. $6^h 2^m 25^s$ . .	9.0	2	VII, IX	27 24 56.8	63.6	65.8	63.6	64.8	56.0	61.77	27.202	. .	26.577
	7	Lalande 12053 . .	8.0	3	V–IX	37 44 59.7	63.7	67.8	66.8	66.8	59.0	63.97	31.381	. .	30.767
	8	O. Arg. S. 5343 . .	. .	3	III–VII	82 55 1.5	7.7	11.2	9.4	9.4	1.7	6.82	35.142	. .	34.540
	9	Anon. $6^h 37^m 47^s$.	. .	3	III–VII	82 9 58.7	65.6	66.8	66.2	66.1	58.5	63.65	33.670	. .	33.068
	10	Anon. $6^h 46^m 15^s$.	. .	2	I, IX	87 24 58.8	63.8	68.5	65.2	66.2	59.3	63.63	30.833	. .	30.253
	11	Anon. $6^h 46^m 21^s$.	. .	2	IV, VI	“ “ “	“	“	“	“	“	“	27.872	. .	27.269
	12	Anon. $6^h 54^m 51^s$.	8.0	3	III–VII	82 34 59.1	64.3	68.6	66.3	66.4	58.1	63.80	31.617	. .	31.015
	13	Anon. $7^h 2^m 23^s$.	. .	2	I, IX	85 0 2.0	8.8	12.9	11.0	11.3	4.3	8.38	30.802	. .	30.220
	14	Lacaille 2623. . .	. .	3	III–VII	“ “ “	“	“	“	“	“	“	28.296	. .	27.695
	15	Anon. $7^h 10^m 18^s$.	. .	3	III–VII	82 20 3.5	10.3	13.2	11.1	1.3	4.3	7.28	28.909	. .	28.307
	16	O. Arg. S. 6762 (1st *)	9.0	3	III–VII	77 39 56.4	64.9	67.8	67.0	66.7	59.0	63.63	33.004	. .	32.401
	17	O. Arg. S. 7063 . .	7.0	3	III–VII	88 0 1.2	6.5	8.2	7.9	7.0	0.9	5.28	31.976	. .	31.375
	18	Nadir	. .	.	. .	200 0 2.9	10.2	13.0	12.2	9.2	5.8	8.88	30.741	. .	. .
4	19	τ^4 Eridani	5.0	3	III–VII	81 5 2.0	6.1	10.1	6.0	7.7	1.4	5.55	31.333	–0.609	30.728
	20	Anon. $3^h 27^m 14^s$.	7.0	3	III–VII	27 20 5.9	13.7	17.0	15.3	15.2	7.1	12.37	35.814	. .	35.199
	21	Weisse III, 751 . .	9.0	3	III–VII	46 50 2.8	8.5	12.7	9.4	12.2	3.7	8.22	32.128	. .	31.517
	22	Weisse (2) III, 1030.	8.3	3	III–VII	23 15 2.6	8.7	11.2	9.3	11.8	2.2	7.63	30.587	. .	29.971
	23	Anon. $3^h 57^m 58^s$.	8.0	3	III–VII	37 10 1.5	8.0	12.0	9.7	10.2	2.7	7.35	30.465	. .	29.852
	24	Anon. $4^h 6^m 28^s$.	9.2	1	V	65 41 57.3	63.1	67.6	63.9	67.1	57.8	62.80	34.957	. .	34.348
	25	Anon. $4^h 18^m 9^s$.	7.0	3	III–VII	79 25 5.1	13.7	16.5	14.8	15.8	5.9	11.97	29.377	. .	28.772
	26	Anon. $4^h 25^m 58^s$.	9.2	3	III–VII	30 24 59.8	64.4	68.2	66.9	67.7	59.9	64.48	30.174	. .	29.560
	27	Anon. $4^h 41^m 57^s$.	9.0	1	V	48 15 1.8	8.2	11.3	10.8	11.4	2.8	7.72	31.098	. .	30.489
	28	Anon. $4^h 41^m 59^s$.	9.0	1	IX	“ “ “	“	“	“	“	“	“	34.508	. .	33.890
	29	Anon. $4^h 54^m 13^s$.	7.7	3	III–VII	87 30 0.6	7.3	9.9	10.2	8.3	1.1	6.23	32.397	. .	31.793
	30	O. Arg. S. 3630 . .	8.5	3	V–IX	86 40 2.2	10.2	13.8	13.7	11.4	3.3	9.10	28.076	. .	27.456
	31	Anon $5^h 19^m 8^s$ . .	9.0	3	III–VII	19 50 2.7	9.5	15.2	13.2	11.8	2.8	9.20	31.068	. .	30.451
	32	Lalande 10871 . .	6.5	3	III–VII	23 45 0.7	9.4	11.8	9.9	9.7	1.1	7.10	27.414	. .	26.798
	33	Lacaille 2062 . .	. .	3	III–VII	82 5 5.2	14.4	17.6	16.1	13.7	6.1	12.18	29.505	. .	28.900
	34	Lalande 11529 . .	. .	2	VII, IX	20 55 1.2	9.5	12.2	10.2	10.3	2 0	7.57	33.378	. .	32.744
	35	κ Columbæ. . . .	7.0	3	III–VII	93 55 2.2	11.5	14.1	13.0	12.3	3.0	9.35	28.775	. .	28.173
	36	Lalande 12798 . .	6.5	3	III–VII	21 35 0.7	10.5	11.8	10.6	8.2	0.6	7.07	26.054	. .	25.438
	37	O. Arg. S. 5704 . .	8.5	3	III–VII	85 14 56.8	65.8	70.1	68.8	67.3	57.9	64.45	30.206	. .	29.602
	38	Anon. $6^h 50^m 10^s$.	8.5	3	V–IX	90 25 0.7	12.4	13.8	12.9	10.8	1.9	8.75	33.864	. .	33 268
	39	Anon. $7^h 2^m 26^s$ . .	8.5	3	III–VII	85 0 1.7	11.3	14.7	12.9	12.0	3.1	9.28	30.959	. .	30.355
	40	Weisse VII, 196. .	8.0	3	III–VII	73 14 59.2	67.4	69.8	70.1	67.2	58.0	65.28	31.949	. .	31.342
	41	Anon. $7^h 15^m 18^s$.	8.5	3	III–VII	“ “ “	“	“	“	“	“	“	26.994	. .	26.387
	42	Anon. $7^h 21^m 37^s$.	7.0	3	III–VII	17 49 59.1	68.4	71.8	70.9	67.2	58.9	66.05	35.741	. .	35.124
	43	Nadir	. .	.	. .	200 0 1.3	11.3	12.9	15.2	8.6	4.1	8.90	30.751	. .	. .
11	44	Lalande 7817 . .	7.5	3	III–VII	14 24 56.4	61.6	64.4	60.1	65.8	55.9	60.70	27.661	–0.521	27.131
	45	Anon. $4^h 18^m 5^s$ . .	8.2	3	III–VII	79 25 2.8	8.9	12.1	7.5	13.7	4.7	8.28	28.971	. .	28.454
	46	Weisse IV, 554 . .	6.0	3	III–VII	53 35 1.2	5.5	8.0	5.8	11.4	2.9	5.80	31.344	. .	30.822
	47	Anon. $4^h 41^m 39^s$.	8.3	3	IX	48 10 0.3	2.7	7.2	4.1	10.2	1.9	4.40	29.430	. .	28.900
	48	Anon. $4^h 41^m 43^s$.	8.8	1	III–VII	“ “ “	“	“	“	“	“	“	31.254	. .	30.731
	49	Anon. $4^h 54^m 12^s$.	7.5	3	III–VII	87 30 4.1	8.7	10.7	9.3	13.7	5.7	8.70	32.155	. .	31.639
	50	Anon. $5^h 1^m 44^s$.	8.3	2	III, VII	29 15 2.4	5.3	9.2	6.2	12.6	4.2	6.65	29.420	. .	28.892
	51	Weisse (2) V, 1414 .	7.5	2	V, IX	“ “ “	“	“	“	“	“	“	30.402	. .	29.868
	52	O. Arg. S. 3920 . .	. .	3	III–VII	75 0 1.2	6.8	11.0	7.4	13.8	4.2	7.40	27.237	. .	26.719
	53	Anon. $5^h 27^m 1^s$ . .	8.3	3	III–VII	64 20 2.0	6.0	9.1	7.1	12.4	3.8	6.73	33.512	. .	32.992
	54	Lacaille 1977 . .	. .	3	III–VII	90 35 4.8	10.6	11.7	9.6	14.4	6.1	9.53	32.329	. .	31.814
	55	Anon. $5^h 49^m 54^s$.	7.8	2	I, IX	88 50 3.9	9.1	13.4	7.1	16.6	6.4	9.42	35.505	. .	35.012
	56	Anon. $5^h 49^m 54^s$.	8.2	2	IV, VI	“ “ “	“	“	“	“	“	“	29.645	. .	29.127
	57	Lalande 12134 . .	6.5	3	III–VII	21 30 6.0	10.9	13.6	9.8	16.8	7.9	10.83	29.450	. .	28.922
	58	O. Arg. S. 5343 . .	. .	3	III–VII	82 55 3.8	9.9	11.0	7.2	13.8	5.1	8.47	34.954	. .	34.437
	59	O. Arg. S. 5704 . .	8.3	3	III–VII	85 15 0.3	3.3	7.6	3.2	8.9	1.2	4.08	29.906	. .	29.390
	60	Anon. $6^h 52^m 16^s$.	8.3	3	III–VII	89 34 57.3	62.3	64.7	61.1	66.7	59.7	61.97	30.748	. .	30.233
	61	Anon. $7^h 1^m 37^s$.	9.5	1	V	73 35 5.2	10.5	13.3	9.8	16.0	6.4	10.20	30.798	. .	30.277
	62	Anon. $7^h 10^m 22^s$.	8.3	3	III–VII	82 20 1.7	3.8	8.2	4.9	10.4	3.1	5.35	28.443	. .	27.926
	63	β Canis Minoris . .	. .	3	III–VII	50 20 2.2	5.8	10.0	5.4	12.4	4.6	6.73	29.517	. .	28.995
	64	Weisse (2) VII, 730 .	9.0	3	III–VII	17 10 5.2	8.8	13.8	7.8	14.3	5.2	9.18	31.961	. .	31.431
	65	Nadir	. .	.	. .	200 0 3.8	8.4	11.8	9.1	12.7	6.4	8.70	30.650	–0.521	. .

Number.	Barometer.	THERM'S. At.	THERM'S. Ex.	Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	− 8.6	N. 0 9 58.2	0.2	+ 39 3 37.2	− 13.7	Y.	
2	. .	. .	. .	+ 1 50.3	N. 12 28 3.2	13.6	+ 51 21 55.6	− 16.5	Y.	
3	32.000	35.0	25.8	− 1 49.8	S. 68 38 18.5	2 36.6	− 29 47 16.3	+ 3.4	Y.	
4	. .	. .	. .	+ 2 18.7	N. 33 32 34.4	40.9	+ 72 26 54.1	− 19.8	Y.	
5	. .	. .	. .	+ 1 59.6	S. 12 32 7.8	13.7	+ 26 21 17.3	− 9.4	Y.	
6	. .	. .	. .	+ 1 47.3	7 26 49.0	8.0	+ 31 26 41.8	− 10.4	Y.	
7	30.195	34.8	27.0	− 24.0	17 44 39.9	19.7	+ 21 8 39.2	− 7.7	Y.	
8	. .	. .	. .	− 2 22.3	62 52 44.5	1 59.6	− 24 1 5.3	+ 0.9	Y.	As one star.
9	. .	. .	27.0	− 1 36.2	62 8 27.5	1 56.0	− 23 16 44.7	+ 0.6	Y.	
10	. .	. .	. .	− 8.0	67 24 55.7	2 27.1	− 28 33 44.0	+ 1.0	Y.	
11	. .	. .	. .	+ 1 25.6	67 26 29.2	2 27.2	− 28 35 17.6	+ 1.0	Y.	
12	. .	. .	. .	− 31.8	62 34 32.0	1 58.2	− 23 42 51.4	+ 0.3	Y.	
13	. .	. .	. .	− 6.9	65 0 1.5	2 11.4	− 26 8 34.1	+ 0.3	Y.	
14	. .	. .	. .	+ 1 12.2	65 1 20.6	2 11.6	− 26 9 53.4	+ 0.3	Y.	
15	. .	. .	. .	+ 53.1	62 21 0.4	1 54.7	− 23 29 16.3	− 0.1	Y.	
16	. .	. .	. .	− 1 15.3	57 38 48.4	1 37.0	− 18 46 46.6	− 0.6	Y.	
17	30.220	34.0	26.5	− 43.1	67 59 22.2	2 31.4	− 29 8 14.8	− 0.1	Y.	
18	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
19	30.144	34.2	22.5	− 22.8	61 4 42.7	1 51.8	− 22 12 55.7	+ 6.3	Y.	
20	. .	. .	. .	− 2 42.9	7 17 29.4	7.9	+ 31 36 1.5	− 12.0	Y.	
21	. .	. .	. .	− 47.5	26 49 20.7	31.4	+ 12 3 46.7	− 5.4	Y.	
22	. .	. .	. .	+ 0.9	3 15 8.5	3.5	+ 35 38 26.8	− 13.6	Y.	
23	. .	. .	. .	+ 4.6	17 10 12.0	19.2	+ 21 43 7.6	− 9.0	Y.	
24	30.156	32.0	21.4	− 2 16.3	45 42 46.5	1 3.7	− 6 50 11.4	+ 0.4	Y.	
25	. .	. .	. .	+ 38.5	59 25 50.4	1 45.0	− 20 33 56.6	+ 4.1	Y.	
26	. .	. .	. .	+ 13.8	10 25 18.3	11.4	+ 28 28 9.1	− 11.4	Y.	Very faint.
27	. .	. .	. .	− 15.3	28 14 52.4	33.4	+ 10 38 13.0	− 5.6	Y.	
28	. .	. .	. .	− 2 1.9	28 13 5.8	33.4	+ 10 39 59.6	− 5.6	Y.	
29	30.190	30.5	20.8	− 56.2	67 29 10.0	2 29.4	− 28 38 0.6	+ 5.0	Y.	
30	. .	. .	. .	+ 1 19.8	S. 66 41 28.8	2 23.9	− 27 50 13.9	+ 4.7	Y.	
31	. .	. .	. .	− 14.1	N. 0 10 4.9	0.2	+ 39 3 43.9	− 13.9	Y.	Faint.
32	. .	. .	. .	+ 1 40.3	S. 3 46 47.4	4.1	+ 35 6 47.3	− 12.2	Y.	
33	30.200	29.2	20.2	+ 34.5	62 5 46.6	1 57.4	− 23 14 5.2	+ 2.3	Y.	
34	. .	. .	. .	− 1 26.0	0 53 41.6	1.0	+ 37 59 56.2	− 12.3	Y.	
35	30.230	28.8	19.6	+ 57.2	73 56 6.6	3 34.6	− 35 6 2.4	+ 3.5	Y.	
36	. .	. .	. .	+ 2 23.0	1 37 30.0	1.8	+ 37 16 7.0	− 10.6	Y.	
37	30.240	28.0	19.2	+ 12.5	65 15 16.9	2 15.2	− 26 23 53.3	+ 1.5	Y.	
38	. .	. .	. .	− 1 42.4	70 23 26.3	2 54.4	− 31 32 41.9	+ 1.9	Y.	
39	. .	. .	. .	− 11.1	64 59 58.2	2 13.6	− 26 8 33.0	+ 1.0	Y.	
40	. .	. .	. .	− 42.1	53 14 23.2	1 23.7	− 14 22 8.1	− 0.4	Y.	
41	. .	. .	. .	+ 1 53.2	S. 53 16 58.5	1 23.9	− 14 24 43.6	− 0.4	Y.	
42	30.232	27.2	18.9	− 2 40.6	N. 2 12 34.5	2.4	+ 41 6 15.7	− 8.7	Y.	
43	. .	. .	. .	. .	. . . .	. . .	. . . .	. .	Y.	
44	29.772	33.8	33.4	+ 1 29.9	N. 5 33 29.4	5.8	+ 44 27 14.0	− 16.6	Y.	
45	. .	. .	. .	+ 48.4	S. 59 25 56.7	1 41.0	− 20 33 58.9	+ 4.6	Y.	
46	29.774	33.8	34.0	− 25.8	33 34 40.1	39.7	+ 5 18 19.0	− 3.5	Y.	
47	. .	. .	. .	− 22.9	28 9 41.5	32.0	+ 10 43 25.3	− 5.4	Y.	
48	. .	. .	. .	+ 34.5	28 10 38.9	32.0	+ 10 42 27.9	− 5.4	Y.	
49	. .	. .	. .	− 51.4	67 29 17.3	2 23.4	− 28 38 1.9	+ 5.7	Y.	
50	. .	. .	. .	+ 34.7	9 15 41.4	9.8	+ 29 37 47.6	− 11.6	Y.	
51	. .	. .	. .	+ 4.1	9 15 10.8	9.8	+ 29 38 18.2	− 11.6	Y,	
52	29.788	33.5	34.0	+ 1 42.9	55 1 50.3	1 25.4	− 16 9 36.9	+ 2.3	Y.	
53	. .	. .	. .	− 1 33.8	44 18 33.0	58.4	− 5 25 52.6	− 0.7	Y.	
54	29.800	33.8	33.0	− 56.9	70 34 12.7	2 48.6	− 31 43 22.5	+ 5.2	Y.	
55	. .	. .	. .	− 2 37.1	68 47 32.3	2 33.5	− 29 56 27.0	+ 4.6	Y.	
56	. .	. .	. .	+ 30.3	68 50 39.8	2 34.0	− 29 59 35.0	+ 4.7	Y.	
57	. .	. .	. .	+ 33.8	1 30 44.6	1.6	+ 37 22 52.6	− 12.0	Y.	
58	29.816	33.5	32.0	− 2 19.1	62 52 49.4	1 56.9	− 24 1 7.5	+ 2.8	Y.	
59	. .	. .	. .	+ 19.1	65 15 23.2	2 9.8	− 26 23 54.2	+ 2.9	Y.	
60	. .	. .	. .	− 7.3	69 34 54.7	2 40.4	− 30 43 56.3	+ 3.3	Y.	
61	. .	. .	. .	− 8.7	53 35 1.5	1 21.5	− 14 42 44.2	+ 0.9	Y.	
62	. .	. .	. .	+ 1 5.0	62 21 10.4	1 54.7	− 23 29 26.3	+ 2.0	Y.	
63	. .	. .	. .	+ 31.5	S. 30 20 38.2	35.3	+ 8 32 25.3	− 3.0	Y.	
64	29.832	33.2	29.8	− 44.8	N. 2 50 35.7	3.0	+ 41 44 17.5	− 9.3	Y.	
65	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. Feb. 13	1	τ^9 Eridani	5.5	3	III–VII	83 15 4.0	9.4	11.8	7.6	11.8	5.1	8.28	32.443	−0.501	31.946
	2	o^1 Eridani	6.0	3	III–VII	66 5 0.3	4.3	8.2	1.7	9.4	1.2	4.18	35.298	. .	34.798
	3	Anon $4^h 17^m 19^s$.	8.0	3	III–VII	42 20 4.5	10.8	13.0	7.9	16.7	7.1	10.00	35.809	. .	35.305
	4	Weisse IV, 554	6.5	3	III–VII	53 34 58.2	61.8	64.8	59.8	67.8	58.8	61.87	31.251	. .	30.749
	5	Anon. $4^h 41^m 34^s$	8.5	2	III, V	48 10 3.9	7.8	11.2	7.8	14.8	5.4	8.48	31.402	. .	30.900
	6	Anon. $4^h 42^m 36^s$	8.5	2	VII, IX	" " "	"	"	"	"	"	"	33.778	. .	33.271
	7	Schjellerup 1589	9.0	3	III–VII	57 30 2.8	6.2	9.5	5.1	11.3	4.1	6.50	29.464	. .	28.963
	8	Anon. $5^h 19^m 13^s$	8.8	3	III–VII	19 50 2.8	7.7	11.7	6.7	13.2	3.1	7.53	30.880	. .	30.371
	9	Anon. $5^h 27^m 3^s$	8.3	3	III–VII	64 19 59.8	63.9	66.8	63.0	67.9	59.7	63.52	33.454	. .	32.954
	10	Anon. $5^h 40^m 40^s$	. .	3	III–VII	90 34 59.0	64.2	66.1	62.1	68.2	59.8	63.23	32.193	. .	31.698
	11	O. Arg. N. 6356	8.0	3	IV–VI	346 29 59.7	61.0	67.2	60.0	66.1	58.9	62.15	30.105	. .	29.595
	12	Anon. $5^h 59^m 47^s$	9.0	3	III–VII	87 25 3.3	10.2	12.1	10.2	13.8	6.0	9.27	27.875	. .	27.379
	13	κ Columbæ	7.0	3	III–VII	93 54 57.6	63.6	64.9	62.1	68.3	59.2	62.62	28.118	. .	27.624
	14	Anon. $6^h 24^m 9^s$	7.8	3	III–VII	84 40 1.2	6.8	9.9	6.7	11.7	4.0	6.72	30.977	. .	30.481
	15	Lalande 12798	6.0	3	III–VII	21 35 3.2	9.4	11.3	8.8	13.8	5.3	8.63	26.010	. .	25.502
	16	Anon. $6^h 46^m 25^s$	8.2	2	I, IX	87 24 57.6	62.9	65.8	63.0	68.6	60.3	63.03	30.596	. .	30.122
	17	Anon. $6^h 54^m 53^s$	8.3	3	III–VII	82 35 1.8	9.1	. .	8.0	. .	4.0	7.78	31.526	. .	31.029
	18	Anon. $7^h 2^m 48^s$	9.0	3	III–VII	73 35 1.2	8.6	10.8	8.1	13.1	2.7	7.42	33.126	. .	32.628
	19	Anon. $7^h 17^m 16^s$	7.3	3	III–VII	83 30 0.5	7.1	9.6	6.8	10.3	1.6	5.98	27.535	. .	27.038
	20	Weisse (2) VII, 727	. .	3	III–VII	42 40 0.6	7.4	10.2	7.3	11.2	2.8	6.58	33.992	. .	33.488
	21	Nadir	. .	.	. .	199 59 56.2	61.8	63.6	61.4	64.2	57.8	60.83	30.380	. .	. .
17	22	Lalande 7833.	8.0	1	IX	14 30 0.0	1.7	5.8	0.5	6.7	57.7	2.07	28.016	−0.699	27.269
	23	Weisse (2) IV, 137	8.0	2	VII, IX	" " "	"	"	"	"	"	"	28.938	. .	28.208
	24	Anon. $4^h 24^m 47^s$	8.2	3	III–VII	23 20 1.7	5.8	9.7	5.6	12.3	2.2	6.22	31.795	. .	31.089
	25	Anon. $4^h 32^m 38^s$	8.0	3	III–VII	85 55 3.3	6.7	11.8	6.7	12.5	4.6	7.60	34.049	. .	33.356
	26	Anon. $4^h 41^m 22^s$	9.2	1	V	48 10 1.2	1.7	7.5	3.2	9.2	1.1	3.98	28.298	. .	27.599
	27	Anon. $4^h 41^m 25^s$	8.5	2	VII, IX	" " "	"	"	"	"	"	"	29.626	. .	28.921
	28	Schjellerup 1589.	9.0	3	III–VII	57 29 59.3	60.4	65.7	61.2	68.8	60.2	62.60	29.385	. .	28.686
	29	Anon. $4^h 57^m 12^s$	8.2	1	V	90 25 1.8	7.4	9.7	5.3	10.3	2.4	6.15	29.760	. .	29.061
	30	Anon. $4^h 57^m 47^s$	9.0	2	VII, IX	" " "	"	"	"	"	"	"	28.526	. .	27.846
	31	Anon. $5^h 6^m 2^s$	9.3	2	IV, VI	84 25 3.8	7.9	12.7	8.0	13.9	5 0	8.55	27.632	. .	26.935
	32	B. A. C. 1713	7.0	3	III–VII	85 31 58.0	62.6	66.9	63.9	68.6	60.1	63.35	34.767	. .	34.073
	33	Anon. $5^h 37^m 42^s$	8.6	3	III–VII	20 50 1.2	4.9	8.8	3.9	11.0	1.5	5.22	34.404	. .	33.697
	34	O. Arg. S. 4453	7.5	3	III–VII	87 50 2.8	6.8	9.9	7.0	11.8	3.4	6.95	31.461	. .	30.767
	35	Lacaille 2092	8.0	3	III–VII	92 39 57.4	61.8	65.1	62.4	64.7	57.0	61.45	30.208	. .	29.515
	36	Weisse (2) VI, 79	8.5	3	III–VII	27 25 1.8	7.6	10.9	7.0	11.3	3.3	6.98	27.398	. .	26.693
	37	Anon. $6^h 15^m 29^s$	8.5	3	III–VII	88 25 2.5	7.4	10.3	4.6	10.4	3.9	6.52	31.313	. .	30.619
	38	Anon. $6^h 24^m 5^s$	8.2	3	III–VII	84 40 0.8	6.2	11.3	7.1	11.2	3.4	6.67	31.176	. .	30.482
	39	Lalande 12805	6.5	3	III–VII	26 15 3.6	8.5	12.0	8.0	11.8	3.2	7.85	35.121	. .	34.416
	40	Anon. $6^h 40^m 26^s$	8.0	3	IV–VI	90 25 4.8	12.1	14.1	11.7	15.3	5.2	10.53	35.946	. .	35.249
	41	Anon. $6^h 49^m 25^s$	8.8	3	III–VII	87 39 57.7	62.1	65.8	60.7	66.4	58.0	61.78	33.284	. .	32.590
	42	Anon. $7^h 2^m 44^s$	9.0	3	III–VII	73 35 2.7	8.5	13.2	10.1	13.0	3.5	8.50	33.593	. .	32.897
	43	Weisse VII, 274	7.5	3	III–VII	73 9 58.1	63.8	66.1	64.0	67.2	58.5	62.95	32.508	. .	31.811
	44	η Canis Majoris	. .	3	III–VII	87 55 2.0	7.7	9.8	7.8	10.7	2.3	6.72	31.177	. .	30.473
	45	Anon. $7^h 29^m 49^s$	8.2	3	V–IX	37 14 57.0	61.4	65.1	62.3	65.4	56.8	61.33	32.206	. .	31.499
	46	ξ Navis	. .	3	III–VII	83 24 59.1	65.8	68.5	67.1	68.5	60.2	64.87	31.827	. .	31.132
	47	Nadir	. .	.	. .	200 0 1.3	9.1	10.1	9 7	10.2	3.7	7.35	30.786	. .	. .
22	48	Anon. $4^h 24^m 47^s$	8.2	1	IX	23 20 1.7	5.8	7.1	1.8	10.8	3.1	5.05	31.564	−0.533	30.996
	49	Anon. $4^h 41^m 22^s$	9.0	3	III–VII	48 10 1.9	3.7	7.8	1.9	11.6	4.8	5.28	28.208	. .	27.673
	50	Anon. $4^h 41^m 25^s$	8.2	1	IX	" " "	"	"	"	"	"	"	29.501	. .	28.959
	51	Anon. $4^h 57^m 33^s$	7.5	3	III–VII	14 20 5.8	8.8	12.9	5.3	14.8	7.3	9.15	30.925	. .	30.383
	52	Anon. $5^h 6^m 3^s$	9.0	3	III–VII	84 24 57.0	60.1	64.8	58.2	67.4	61.1	61.43	27.251	. .	26.723
	53	o Columbæ	. .	2	VIII, IX	93 55 1.1	3.9	5.7	0.4	10.1	3.0	4.03	37.215	. .	36.709
	54	B. A. C. 1713	7.0	3	III–VII	85 35 1.9	5.4	9.3	3.1	12.2	5.5	6.23	34.587	. .	34.059
	55	Anon. $5^h 34^m 57^s$	8.2	3	III–VII	20 35 3.8	7.2	12.0	3.8	14.4	5.2	7.73	29 008	. .	28.467
	56	Anon. $5^h 37^m 42^s$	8.5	3	V–IX	20 50 3.1	8.2	10.5	4.8	14.4	5.7	7.78	34.389	. .	33.840
	57	Anon. $5^h 48^m 37^s$	8.5	2	V, VI	346 25 2.1	4.3	11.1	2.9	11.6	4.2	6.03	26.146	. .	25.606
	58	Anon. $5^h 59^m 58^s$	9.0	3	V–IX	20 55 0.8	3.8	6.4	1.8	9.2	2.4	4.07	30.845	. .	30.296
	59	Weisse (2) VI, 79	8.5	3	V–IX	27 25 4.4	9.0	11.8	6.9	15.2	8.2	9.25	27.184	. .	26.638
	60	Anon. $6^h 15^m 29^s$	8.5	3	III–VII	88 24 57.3	61.2	62.8	56.2	66.4	60.3	60.70	30.785	. .	30.257
	61	Anon. $6^h 24^m 5^s$	8.0	3	III–VII	84 40 2.4	5.6	10.0	5.6	12.4	6.1	7.02	30.876	. .	30.348
	62	Lalande 12805	6.0	3	III–VII	26 14 57.5	61.8	63.7	58.9	67.2	60.5	61.60	34.781	. .	34.242
	63	Anon. $6^h 40^m 24^s$	8.0	3	III–VII	90 25 2.8	6.7	9.1	4.3	11.7	4.7	6.55	35.466	. .	34.939
	64	Anon. $6^h 49^m 29^s$	8.5	3	III–VII	87 39 57.9	60.0	62.9	59.1	66.2	59.0	60.85	32.948	. .	32.420
	65	Anon. $7^h 2^m 43^s$	9.0	3	III–VII	73 35 3.2	7.7	10.8	6.3	14.3	5.7	8.00	33.211	. .	32.681
	66	Anon. $7^h 10^m 8^s$	8.0	3	III–VII	73 10 1.9	6.2	9.1	4.4	11.8	4.2	6.27	32.317	. .	31.786
	67	η Canis Majoris	. .	3	III–VII	87 55 1.8	5.8	8.3	3.7	11.7	5.3	6.10	30.861	−0.533	30.333

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	30.000	36.2	32.3	− 1 1.0	S. 63 14 7.3	1 59.4	− 24 22 27.9	+ 6.1	Y.	
2	. .	. .	. .	− 2 30.4	46 2 33.8	1 2.7	− 7 9 57.7	+ 0.9	Y.	
3	. .	. .	. .	− 2 46.2	22 17 23.7	24.8	+ 16 35 50.3	− 7.3	Y.	
4	30.000	35.8	31.2	− 23.5	33 34 38.4	40.2	+ 5 18 20.2	− 3.5	Y.	
5	. .	. .	. .	− 28.2	28 9 40.3	32.5	+ 10 43 26.0	− 5.4	Y.	
6	. .	. .	. .	− 1 42.5	28 8 26.0	32.5	+ 10 44 40.3	− 5.4	Y.	
7	. .	. .	. .	+ 32.5	S. 37 30 39.0	46.6	+ 1 22 13.2	− 2.4	Y.	
8	. .	. .	. .	− 11.6	N. 0 10 4.1	0.2	+ 39 3 43.1	− 14.5	Y.	
9	30.016	35.0	29.3	− 1 32.6	S. 44 18 31.0	59.4	− 5 25 51.6	− 0.6	Y.	
10	. .	. .	. .	− 53.2	S. 70 34 10.0	2 51.1	− 31 43 22.3	+ 5.4	Y.	
11	. .	. .	. .	+ 12.7	N. 33 29 45.2	40.2	+ 72 24 4.2	− 21.9	Y.	
12	30.000	34.0	28.4	+ 1 22.2	S. 67 26 31.4	2 25.8	− 28 35 18.4	+ 4.4	Y.	
13	. .	. .	28.2	+ 1 14.5	73 56 17.1	3 29.1	− 35 6 7.4	+ 5.1	Y.	
14	. .	. .	. .	− 15.1	64 39 51.7	2 8.1	− 25 48 21.0	+ 3.4	Y.	
15	. .	. .	. .	+ 2 21.0	1 37 29.6	1.7	+ 37 16 7.5	− 11.4	Y.	
16	. .	. .	. .	− 3.8	67 24 59.2	2 25.6	− 28 33 46.0	+ 3.4	Y.	
17	29.982	33.5	28.3	− 32.2	62 34 35.5	1 56.9	− 23 42 53.6	+ 2.6	Y.	Applied + 2″.06 to mean of A, B, D, and F.
18	. .	. .	. .	− 1 22.4	53 33 45.1	1 22.4	− 14 41 28.7	+ 1.1	Y.	
19	. .	. .	. .	+ 1 32.8	63 31 38.8	2 1.8	− 24 40 1.8	+ 2.4	Y.	
20	29.960	33.0	28.1	− 1 49.3	S. 22 38 17.2	25.4	+ 16 14 56.2	− 4.4	Y.	
21	. .	. .	. .	. .	. . . .	. .	. . . . .	. .	Y.	
22	. .	. .	. .	+ 1 25.6	N. 5 28 32.3	5.8	+ 44 22 16.9	− 16.6	Y.	
23	29.980	37.0	34.0	+ 56.2	N. 5 29 1.7	5.8	+ 44 22 46.3	− 16.6	Y.	
24	. .	. .	. .	− 34.1	S. 3 19 32.1	3.5	+ 35 34 3.2	− 13.8	Y.	
25	29.986	36.5	32.3	− 1 45.2	65 53 22.4	2 14.3	− 27 1 57.9	+ 6.2	Y.	
26	. .	. .	. .	+ 1 15.3	28 11 19.3	32.4	+ 10 41 47.1	− 5.3	Y.	
27	. .	. .	. .	+ 33.8	28 10 37.8	32.4	+ 10 42 28.6	− 5.3	Y.	
28	. .	. .	. .	+ 41.2	37 30 43.8	46.5	+ 1 22 8.5	− 2.2	Y.	
29	. .	. .	. .	+ 29.4	70 25 35.6	2 49.1	− 31 34 45.9	+ 6.8	Y.	
30	. .	. .	. .	+ 1 7.5	70 26 13.6	2 49.2	− 31 35 24.0	+ 6.7	Y.	
31	. .	. .	. .	+ 1 36.1	64 26 44.6	2 6.4	− 25 35 12.2	+ 5.3	Y.	
32	30.000	35.0	29.4	− 2 7.6	65 32 55.7	2 13.1	− 26 41 30.0	+ 5.2	Y.	
33	. .	. .	. .	− 1 55.9	0 48 9.3	0.9	+ 38 5 28.6	− 13.9	Y.	
34	. .	. .	. .	− 24.0	67 49 42.9	2 28.8	− 28 58 32.9	+ 5.2	Y.	
35	30.020	34.0	27.4	+ 15.2	72 40 16.6	3 13.7	− 33 49 51.5	+ 6.0	Y.	
36	. .	. .	. .	+ 1 43.7	7 26 50.6	8.0	+ 31 26 40.2	− 11.2	Y.	
37	. .	. .	. .	− 19.4	68 24 47.1	2 33.7	− 29 33 42.0	+ 4.8	Y.	Saw only one till much later.
38	30.039	33.0	26.3	− 15.1	64 39 51.6	2 8.8	− 25 48 21.6	+ 4.0	Y.	
39	. .	. .	. .	− 2 18.4	6 12 49.4	6.7	+ 32 40 42.7	− 10.5	Y.	
40	. .	. .	. .	− 2 44.5	70 22 26.0	2 50.7	− 31 31 37.9	+ 4.6	Y.	
41	30.040	32.0	25.1	− 1 21.2	67 38 40.6	2 28.5	− 28 47 30.3	+ 4.1	Y.	
42	. .	. .	. .	− 1 30.8	53 33 37.7	1 23.1	− 14 41 22.0	+ 1.6	Y.	
43	. .	. .	. .	− 56.8	53 9 6.2	1 22.0	− 14 16 49.4	+ 1.5	Y.	
44	30.044	31.0	24.0	− 14.8	67 54 51.9	2 30.8	− 29 3 43.9	+ 3.6	Y.	
45	. .	. .	. .	− 47.0	17 14 14.4	19.1	+ 21 39 5.3	− 5.4	Y.	
46	30.046	30.2	23.0	− 35.5	63 24 29.4	2 2.8	− 24 32 53.4	+ 2.8	Y.	
47	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
48	30.176	46.2	42.8	− 31.2	3 19 33.8	3.5	+ 35 34 1.5	− 13.7	Y.	
49	. .	. .	. .	+ 1 12.9	28 11 18.2	31.9	+ 10 41 48.7	− 5.0	Y.	
50	. .	. .	. .	+ 32.6	S. 28 10 37.9	31.9	+ 10 42 29.0	− 5.0	Y.	
51	. .	. .	. .	− 12.0	N. 5 40 2.9	5.9	+ 44 33 47.6	− 16.7	Y.	
52	30.174	46.0	41.2	+ 1 42.7	S. 64 26 44.2	2 4.2	− 25 35 9.6	+ 5.7	Y.	
53	. .	. .	. .	− 3 30.3	73 51 33.8	3 23.5	− 35 1 18.5	+ 7.6	Y.	
54	. .	. .	. .	− 2 7.2	65 32 59.0	2 10.6	− 26 41 30.8	+ 5.7	Y.	
55	. .	. .	. .	+ 48.0	0 35 55.8	0.6	+ 38 17 42.4	− 14.2	Y.	
56	. .	. .	. .	− 2 0.3	S. 0 48 7.4	0.8	+ 38 5 30.6	− 14.1	Y.	
57	30.170	45.8	40.4	+ 2 17.7	N. 33 32 36.2	39.6	+ 72 26 54.6	− 23.2	Y.	
58	. .	. .	. .	− 9.3	S. 0 54 54.8	0.9	+ 37 58 43.1	− 13.5	Y.	
59	. .	. .	. .	+ 1 45.4	7 26 54.6	7.8	+ 31 26 36.4	− 11.3	Y.	
60	30.166	45.2	40.3	− 8.1	68 24 52.6	2 30.0	− 29 33 43.8	+ 5.6	Y.	
61	. .	. .	. .	− 10.9	64 39 56.1	2 5.7	− 25 48 23.0	+ 4.7	Y.	
62	. .	. .	. .	− 2 13.0	6 12 48.6	6.5	+ 32 40 43.7	− 10.7	Y.	
63	30.164	45.0	39.5	− 2 34.8	70 22 31.8	2 46.4	− 31 31 39.4	+ 5.6	Y.	
64	. .	. .	. .	− 1 15.9	67 38 45.0	2 24.6	− 28 47 30.8	+ 5.0	Y.	
65	. .	. .	. .	− 1 24.0	53 33 44.0	1 20.9	− 14 41 26.1	+ 2.4	Y.	
66	30.162	45.0	39.8	− 56.0	53 9 10.3	1 19.7	− 14 16 51.2	+ 2.3	Y.	
67	. .	. .	. .	− 10 4	S. 67 54 55.7	2 26.5	− 29 3 43.4	+ 4.7	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. Feb. 22	1	Weisse (2) VII, 727	7.5	3	V–IX	42 40 2.3	7.0	9.8	4.3	12.7	5.4	6.92	34.025	−0.533	33.486
	2	Anon. $7^h 34^m 49^s$	8.0	3	III–VII	73 15 2.7	6.7	9.8	6.1	13.2	5.5	7.33	33.192	. .	32.657
	3	ξ Navis	. .	3	III–VII	83 25 2.4	6.6	9.0	6.8	12.2	4.9	6.98	31.491	. .	30.962
	4	Lacaille 3192	6.5	3	III–VII	88 25 1.2	5.3	7.5	4.1	10.2	5.0	5.55	33.609	. .	33.081
	5	O. Arg. S. 8610	8.2	3	III–VII	88 50 2.9	7.5	10.0	4.8	13.9	6.5	7.60	34.089	. .	33.562
	6	Nadir	. .	.	. .	200 0 2.5	5.1	8.2	4.9	10.5	6.3	6.25	30.580	. .	. .
26	7	Lacaille 1675	7.0	3	III–VII	91 15 5.6	9.2	12.0	7.0	11.6	6.1	8.58	27.540	−0.520	27.026
	8	o Columbæ	5.0	3	III–VII	93 49 59.2	62.2	64.9	60.3	66.8	59.7	62.18	27.537	. .	27.024
	9	Anon. $5^h 21^m 16^s$	9.0	3	V–IX	20 0 3.7	4.3	10.2	4.8	11.2	3.4	6.27	31.825	. .	31.288
	10	ϑ Orionis (3d *)	7.0	3	III–VII	64 20 3.2	4.7	9.2	5.9	9.3	3.4	5.95	28.532	. .	28.013
	11	ϑ Orionis (4th *)	. .	1	IX	" " "	"	"	"	"	"	"	28.749	. .	28.234
	12	Lalande 10871	6.5	3	III–VII	23 45 2.3	5.8	9.4	4.7	10.3	3.8	6.05	27.301	. .	26.774
	13	O. Arg. S. 4453	8.0	3	III–VII	87 50 3.8	6.4	10.3	6.3	10.3	4.2	6.88	31.068	. .	30.553
	14	Lalande 11529	7.0	3	III–VII	20 55 1.5	5.8	10.0	5.3	10.7	3.9	6.20	33.211	. .	32.683
	15	κ Columbæ	5.5	3	III–VII	93 54 55.3	58.8	63.2	57.8	64.3	56.8	59.33	27.795	. .	27.282
	16	11 Monocerotis (1st *)	6.5	2	I, IX	65 49 59.2	61.7	66.9	61.8	66.8	60.0	62.73	30.726	. .	30.212
	17	11 Monocerotis (2d *)	6.0	2	IV, VI	" " "	"	"	"	"	"	"	30.540	. .	30.021
	18	Lalande 12805	6.5	3	III–VII	26 15 1.8	6.2	9.8	3.9	9.7	2.1	5.58	34.925	. .	34.399
	19	22 Canis Majoris	. .	3	III–VII	86 34 57.1	61.2	65.2	60.0	63.8	58.9	61.03	26.886	. .	26.371
	20	Weisse (2) VII, 327	8.0	3	III–VII	36 40 3.0	6.2	11.3	6.1	10.4	3.2	6.70	34.162	. .	33.638
	21	β Canis Minoris	. .	3	V–IX	50 20 0.0	1.4	6.1	1.6	6.9	1.0	2.83	29.359	. .	28.836
	22	Anon. $7^h 34^m 13^s$	8.3	3	III–VII	48 30 5.2	8.8	12.5	9.4	13.9	6.0	9.30	34.400	. .	33.878
	23	ξ Navis	. .	3	III–VII	83 25 1.6	7.3	9.8	7.0	9.2	3.1	6.33	31.464	. .	30.948
	24	Anon. $7^h 51^m 30^s$	9.0	2	VII, IX	89 25 0.2	6.2	10.1	4.9	8.4	2.5	5.38	33 942	. .	33.441
	25	Lacaille 3192	7.0	3	III–VII	88 24 56.2	60.2	64.0	58.5	63.2	57.1	59.87	33.393	. .	32.878
	26	Nadir	. .	.	. .	199 59 58.5	63.1	66.6	63.9	64.5	61.2	62.97	30.464	. .	. .
Mar. 4	27	B. A. C. 1641	6.0	3	III–VII	93 55 4.2	9.7	11.8	10.3	13.3	5.5	9.13	31.992	−0.567	31.432
	28	ο Columbæ	5.0	3	IV–VI	" " "	"	"	"	"	"	"	37.575	. .	37.010
	29	O. Arg. N. 5930	. .	3	IV–VI	348 34 59.2	63.8	69.8	63.8	66.9	58.3	63.63	26.627	. .	26.052
	30	Anon. $5^h 37^m 43^s$	8.8	3	III–VII	20 49 58.3	63.3	66.2	63.5	67.7	59.0	63.00	34.249	. .	33.674
	31	Anon. $5^h 42^m 13^s$	. .	3	III–VII	49 5 5.8	11.8	15.8	13.0	15.7	8.2	11.72	36.293	. .	35.724
	32	O. Arg. N. 6390	8.8	3	IV–VI	346 35 4.2	6.1	13.2	8.0	10.2	4.2	7.65	30.242	. .	29.666
	33	Anon. $6^h 7^m 32^s$	9.0	3	III–VII	20 0 0.3	5.8	9.8	6.0	10.3	0.9	5.52	30.137	. .	29.562
	34	Lalande 12134	7.5	3	III–VII	21 30 1.9	7.7	10.8	8.0	10.6	3.2	7.03	29.366	. .	28.792
	35	Anon. $6^h 27^m 16^s$	8.3	3	III–VII	90 0 0.9	6.3	8.8	6.7	7.5	1.0	5.20	29.459	. .	28.898
	36	Anon. $6^h 37^m 20^s$	8.0	3	III–VII	82 5 3.8	9.8	13.2	11.8	12.8	5.0	9.40	29.591	. .	29.028
	37	Anon. $6^h 46^m 11^s$	8.0	2	I, X	87 25 0.2	4.9	8.6	7.1	9.2	1.8	5.30	27.615	. .	27.053
	38	Anon. $6^h 46^m 12^s$	9.0	3	III–VII	" " "	"	"	"	"	"	"	30.662	. .	30.121
	39	Anon. $6^h 56^m 26^s$	9.0	2	I, IX	89 20 1.8	7.8	9.8	8.5	9.7	3.0	6.77	34.283	. .	33.745
	40	Anon. $6^h 56^m 27^s$	9.0	3	IV–VI	" " "	"	"	"	"	"	"	35.759	. .	35.194
	41	Anon. $7^h 9^m 24^s$	9.0	1	V	17 10 0.2	6.0	9.9	7.2	8.3	59.8	5.23	34.266	. .	33.699
	42	O. Arg. S. 6762	6.0	2	I, IX	77 40 0.8	6.7	9.9	7.1	10.1	2.2	6.13	34.118	. .	33.567
	43	Anon. $7^h 19^m 14^s$	9.0	1	V	" " "	"	"	"	"	"	"	32.955	. .	32.388
	44	Anon. $7^h 29^m 51^s$	8.3	3	IV–VI	37 14 53.2	56.8	61.2	58.1	60.2	51.9	56.90	31.947	. .	31.379
	45	Anon. $7^h 42^m 36^s$	. .	2	III, VII	82 45 0.8	6.9	9.7	8.1	7.2	0.8	5.58	29.368	. .	28.807
	46	Anon. $7^h 54^m 6^s$	9.0	2	III, VII	88 50 4.8	12.1	14.2	13.4	15.8	7.2	11.25	28.226	. .	27.668
	47	31 Lyncis	. .	3	III–VII	15 20 3.8	9.2	13.0	8.2	11.3	3.1	8.10	33.957	. .	33.381
	48	Nadir	. .	.	. .	200 0 1.7	6.4	11.1	9.5	7.2	3.9	6.65	30.627	. .	. .
8	49	Anon. $5^h 42^m 13^s$	9.0	3	III–VII	49 5 0.1	3.9	6.8	3.0	8.7	3.1	4.27	36.523	−0.700	35.821
	50	Lacaille 2065	7.0	3	III–VII	90 25 4.8	9.3	12.2	8.0	12.8	4.8	8.65	32.739	. .	32.045
	51	Anon. $5^h 59^m 57^s$	9.0	3	V–IX	38 44 57.1	62.2	65.2	59.7	67.2	59.5	61.82	29.891	. .	29.183
	52	Anon. $6^h 7^m 30^s$	9.0	3	V–IX	20 0 58.7	62.4	66.8	61.8	67.7	58.8	62.70	30.299	. .	29.582
	53	Anon. $6^h 15^m 29^s$	8.3	3	III–VII	88 25 0.2	3.8	7.2	3.4	8.6	1.1	4.05	31.090	. .	30.395
	54	ξ^1 Canis Majoris	. .	3	III–VII	82 10 0.8	4.8	9.3	6.1	10.1	2.1	5.53	27.724	. .	27.028
	55	Anon. $6^h 37^m 19^s$	8.0	3	III–VII	82 4 59.9	63.7	66.2	64.8	67.6	59.9	63.68	29.565	. .	28.869
	56	Anon. $6^h 43^m 49^s$	8.2	3	III–VII	87 25 3.1	9.1	11.8	9.3	13.3	5.5	8.68	25.273	. .	24.578
	57	O. Arg. S. 5745	7.5	2	VII, IX	" " "	"	"	"	"	"	"	36.626	. .	35.943
	58	Anon. $6^h 54^m 52^s$	. .	3	III–VII	82 35 2.4	7.5	11.2	8.4	10.7	4.1	7.38	31.669	. .	30.973
	59	Anon. $6^h 55^m 27^s$	. .	2	VII, IX	" " "	"	"	"	"	"	"	34.864	. .	34.178
	60	O. Arg. S. 6343	7.5	3	III–VII	89 20 0.2	5.8	7.7	4.1	8.7	1.2	4.62	33.431	. .	32.737
	61	Anon. $7^h 13^m 1^s$	9.0	3	III–VII	33 39 57.1	62.8	65.4	63.1	66.0	59.0	62.23	29.880	. .	29.175
	62	Anon. $7^h 13^m 26^s$	8.5	2	VII, IX	" " "	"	"	"	"	"	"	31.784	. .	31.069
	63	Anon. $7^h 24^m 32^s$	8.7	3	III–VII	79 25 0.0	4.8	8.3	5.5	8.3	1.3	4.70	32.012	. .	31.316
	64	Anon. $7^h 25^m 3^s$	7.8	2	VII, IX	" " "	"	"	"	"	"	"	31.021	. .	30.333
	65	Anon. $7^h 34^m 49^s$	8.3	3	III–VII	73 15 59.4	64.0	68.1	65.5	69.3	60.9	64.53	33.275	. .	32.577
	66	Anon. $7^h 45^m 54^s$	9.0	2	VII, IX	58 25 1.7	7.7	10.0	9.0	12.4	6.0	7.80	28.452	. .	27.752
	67	Lacaille 3168	6.5	3	III–VII	96 10 3.5	9.1	12.9	8.5	12.0	4.6	8.43	33.352	. .	32.659
	68	31 Lyncis	. .	3	III–VII	15 20 4.2	9.5	14.2	8.1	11.7	4.2	8.65	34.100	−0.700	33.391

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	− 1 49.3	S. 22 38 17.6	25.0	+ 16 14 56.2	− 4.3	Y.	
2	. .	. .	. .	− 1 23.3	53 13 44.1	1 20.0	− 14 21 25.3	+ 2.4	Y.	
3	30.170	44.5	39.4	− 30.1	63 24 36.8	1 59.1	− 24 32 57.1	+ 3.9	Y.	
4	. .	. .	. .	− 1 36.6	68 23 29.0	2 30.1	− 29 32 20.3	+ 4.2	Y.	
5	30.172	44.5	39.5	− 1 51.7	68 48 15.9	2 33.3	− 29 57 10.4	+ 4.0	Y.	
6	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
7	29.940	49.5	42.4	+ 1 33.2	71 16 41.8	2 52.5	− 32 25 55.5	+ 7.4	Y.	
8	. .	. .	. .	+ 1 33.2	S. 73 51 35.4	3 21.5	− 35 1 18.1	+ 7.7	Y.	
9	. .	. .	. .	− 40.4	N. 0 0 34.1	0.0	+ 38 54 12.9	− 14.8	Y.	
10	. .	. .	. .	+ 1 2.3	S. 44 21 8.2	57.8	− 5 28 27.2	+ 0.1	Y.	
11	29.924	49.0	40.7	+ 55.4	44 21 1.3	57.8	− 5 28 20.3	+ 0.1	Y.	
12	. .	. .	. .	+ 1 41.1	3 46 47.2	3.9	+ 35 6 47.7	− 13.3	Y.	
13	29.920	48.2	38.2	− 17.3	67 49 49.6	2 25.1	− 28 58 35.9	+ 6.1	Y.	
14	. .	. .	. .	− 1 24.1	0 53 42.1	0.9	+ 37 59 55.8	− 13.8	Y.	
15	. .	. .	. .	+ 1 25.2	73 56 24.5	3 24.1	− 35 6 9.8	+ 7.0	Y.	
16	. .	. .	. .	− 6.7	45 49 56.1	1 1.3	− 6 57 18.6	+ 0.6	Y.	
17	. .	. .	. .	− 0.7	45 50 2.1	1 1.3	− 6 57 24.6	+ 0.6	Y.	
18	. .	. .	. .	− 2 17.9	6 12 47.7	6.5	+ 32 40 44.6	− 11.0	Y.	
19	29.916	46.5	37.6	+ 1 53.8	66 36 54.8	2 17.0	− 27 45 33.0	+ 5.2	Y.	
20	. .	. .	. .	− 1 54.0	16 38 12.7	17.8	+ 22 15 8.3	− 6.6	Y.	
21	. .	. .	. .	+ 36.5	30 20 39.3	34.9	+ 8 32 24.6	− 2.6	Y.	
22	29.910	46.0	37.4	− 2 1.5	28 28 7.8	32.3	+ 10 24 58.7	− 2.6	Y.	
23	. .	. .	. .	− 29.7	63 24 36.6	1 58.9	− 24 32 56.7	+ 4.5	Y.	
24	. .	. .	. .	− 1 47.8	69 23 17.5	2 37.7	− 30 32 16.4	+ 5.2	Y.	
25	29.902	45.7	36.7	− 1 30.2	68 23 29.7	2 29.6	− 29 32 20.5	+ 4.9	Y.	
26	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
27	. .	. .	. .	− 44.9	73 54 24.2	3 30.1	− 35 4 15.5	+ 8.0	Y.	
28	30.270	39.0	28.8	− 3 39.7	S. 73 51 29.4	3 29.6	− 35 1 20.2	+ 8.0	Y.	
29	. .	. .	. .	+ 2 3.7	N. 31 22 52.6	37.5	+ 70 17 8.9	− 24.2	Y.	
30	. .	. .	. .	− 1 55.1	S. 0 48 7.8	0.9	+ 38 5 30.1	− 14.5	Y.	
31	30.266	39.0	29.2	− 2 59.4	S. 29 2 12.3	34.1	+ 9 50 52.4	− 4.6	Y.	
32	. .	. .	. .	+ 10.5	N. 33 24 41.9	40.5	+ 72 19 1.2	− 24.1	Y.	
33	. .	. .	. .	+ 13.7	S. 0 0 19.2	0.0	+ 38 53 19.6	− 14.2	Y.	
34	. .	. .	. .	+ 37.8	1 30 44.9	1.6	+ 37 22 52.3	− 13.4	Y.	
35	30.262	37.0	28.7	+ 34.5	70 0 39.7	2 47.5	− 31 9 48.4	+ 6.8	Y.	
36	. .	. .	. .	+ 30.5	62 5 39.9	1 55.6	− 23 13 56.7	+ 5.1	Y.	
37	. .	. .	. .	+ 1 32.3	67 26 37.6	2 26.9	− 28 35 25.7	+ 6.2	Y.	
38	. .	. .	. .	− 3.8	67 25 1.5	2 26.9	− 28 33 49.6	+ 6.2	Y.	
39	. .	. .	. .	− 1 57.4	69 18 9.4	2 41.4	− 30 27 12.0	+ 6.5	Y.	
40	30.262	36.2	28.4	− 2 42.8	S. 69 17 24.0	2 41.4	− 30 26 26.6	+ 6.5	Y.	
41	. .	. .	. .	− 1 55.9	N. 2 51 50.7	3.1	+ 41 45 32.6	− 12.8	Y.	
42	. .	. .	. .	− 1 51.8	S. 57 38 14.4	1 36.8	− 18 46 12.4	+ 4.2	Y.	
43	. .	. .	. .	− 1 14.9	57 38 51.3	1 36.8	− 18 46 49.3	+ 4.2	Y.	Preceded last by 7^s.
44	. .	. .	. .	− 43.2	17 14 13.7	19.1	+ 21 39 6.0	− 5.9	Y.	
45	30.254	35.8	27.8	+ 37.4	62 45 43.0	1 59.0	− 23 54 3.2	+ 5.2	Y.	
46	. .	. .	. .	+ 1 13.1	S. 68 51 24.3	2 38.2	− 30 0 23.7	+ 6.1	Y.	
47	30.280	35.2	27.2	− 1 46.0	N. 4 41 37.9	5.1	+ 43 35 21.8	− 9.3	Y.	
48	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
49	. .	. .	. .	− 3 2.4	S. 29 2 1.8	33.5	+ 9 51 3.5	− 4.5	Y.	
50	30.080	40.3	34.8	− 1 4.1	70 24 4.6	2 47.9	− 31 33 13.7	+ 7.3	Y.	
51	. .	. .	. .	+ 25.6	18 45 27.4	20.5	+ 20 7 50.9	− 7.9	Y.	
52	. .	. .	. .	+ 13.1	0 0 15.8	0.0	+ 38 53 23.0	− 14.2	Y.	
53	30.080	40.2	34.0	− 12.4	68 24 51.7	2 31.6	− 29 33 44.5	+ 6.9	Y.	
54	. .	. .	. .	+ 1 33.1	62 11 38.6	1 54.1	− 23 19 53.9	+ 5.5	Y.	
55	. .	. .	. .	+ 35.4	62 5 39.1	1 53.6	− 23 13 53.9	+ 5.5	Y.	
56	. .	. .	. .	+ 2 50.0	67 27 58.6	2 24.7	− 28 36 44.5	+ 6.7	Y.	
57	30.080	40.0	33.5	− 3 6.2	67 22 2.4	2 24.1	− 28 30 47.7	+ 6.7	Y.	
58	. .	. .	. .	− 30.5	62 34 36.9	1 56.1	− 23 42 54.2	+ 5.7	Y.	
59	. .	. .	. .	− 2 11.0	62 32 56.4	1 56.0	− 23 41 13.6	+ 5.7	Y.	
60	. .	. .	. .	− 1 25.8	69 18 38.8	2 39.1	− 30 27 39.1	+ 7.0	Y.	
61	. .	. .	. .	+ 25.9	13 40 28.1	14.7	+ 25 12 56.0	− 7.7	Y.	
62	30.080	39.0	32.5	− 33.5	13 39 28.7	14.7	+ 25 13 55.4	− 7.7	Y.	
63	. .	. .	. .	− 41.2	59 24 23.5	1 42.2	− 20 32 26.9	+ 5.1	Y.	
64	. .	. .	. .	− 10.4	59 24 54.3	1 42.2	− 20 32 57.7	+ 5.1	Y.	
65	. .	. .	. .	− 1 20.8	53 13 43.8	1 21.0	− 14 21 26.0	+ 3.9	Y.	
66	. .	. .	. .	+ 1 10.4	38 26 18.2	48.1	+ 0 26 32.5	+ 0.5	Y.	
67	30.094	38.0	31.7	− 1 23.3	S. 76 8 45.1	4 1.8	− 37 19 8.1	+ 7.7	Y.	Unsteady.
68	. .	. .	. .	− 1 46.3	N. 4 41 37.6	5.0	+ 43 35 21.4	− 9.7	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
1875.						° ′ ″	″	″	″	″	″	″	r.	r.	r.
Mar. 8	1	Anon. $8^h 30^m 38^s$.	7.2	3	III–VII	68 10 2.8	8.7	14.0	10.7	12.4	6.3	9.15	32.036	−0.700	31.338
	2	Anon. $8^h 45^m 14^s$.	8.5	1	V	100 4 57.2	62.2	64.5	61.0	65.5	57.0	61.23	31.039	. .	30.339
	3	Weisse (2) IX, 79 .	9.2	3	III–VII	38 20 5.2	11.0	15.6	12.8	16.7	8.0	11.55	28.966	. .	28.262
	4	Nadir	. .	.	. .	199 59 58.3	65.1	68.0	64.8	66.1	60.3	63.77	30.670	. .	. .
10	5	Lacaille 1993 . .	6.5	3	III–VII	94 35 0.7	3.2	7.3	3.1	9.3	2.9	4.42	33.472	−0.572	32.907
	6	Lacaille 2085 . .	. .	3	III–VII	93 20 2.9	5.4	8.2	7.1	11.2	4.0	6.47	31.026	. .	30.461
	7	Anon. $5^h 59^m 57^s$.	9.0	2	VII, IX	38 45 0.3	2.7	7.1	1.4	10.4	3.5	4.23	29.997	. .	29.413
	8	Anon. $6^h 7^m 30^s$.	. .	2	VII, IX	19 59 58.0	59.8	64.2	60.9	66.8	58.9	61.43	30.230	. .	29.633
	9	Anon. $6^h 15^m 31^s$.	. .	3	III–VII	88 25 2.7	5.1	8.8	3.5	11.6	5.1	6.13	31.085	. .	30.518
	10	ξ^1 Canis Majoris . .	6.0	3	III–VII	82 10 0.8	4.0	8.3	3.8	9.8	2.9	4.93	27.468	. .	26.900
	11	Anon. $6^h 37^m 18^s$.	8.3	3	III–VII	82 5 1.7	5.2	8.2	3.4	10.6	3.2	5.38	29.501	. .	28.933
	12	O. Arg. S. 5906 . .	7.5	3	III–VII	87 45 0.1	3.0	4.8	2.0	7.8	1.0	6.12	32.627	. .	32.060
	13	B. A. C. 2383 . .	. .	3	III–VII	32 0 3.3	6.4	9.9	6.8	11.8	6.0	7.37	33.584	. .	33.007
	14	Anon. $7^h 15^m 52^s$.	8.5	3	V–IX	13 50 0.9	6.7	8.2	4.0	11.2	3.0	5.67	34.378	. .	33.785
	15	o Geminorum . . .	5.0	3	III–VII	23 59 58.8	61.8	66.1	61.3	66.8	60.8	62.60	28.174	. .	27.595
	16	Nadir	. .	.	. .	200 0 3.7	7.5	11.8	9.2	13.2	7.7	8.85	30.705	. .	. .
13	17	Lacaille 2130 . .	6.0	3	III–VII	88 35 1.4	2.8	5.8	3.7	6.9	4.2	4.13	28.962	−0.862	28.105
	18	B. A. C. 2027 . .	6.5	3	III–VII	" " "	"	"	"	"	"	"	28.791	. .	27.934
	19	Lacaille 2232 . .	7.5	3	III–VII	88 30 5.0	5.8	9.8	7.4	10.4	8.8	7.87	34.891	. .	34.034
	20	Lacaille 2271 . .	7.0	1	IX	" " "	"	"	"	"	"	"	32.573	. .	31.739
	21	Lacaille 2323 . .	. .	3	III–VII	86 10 0.9	2.6	7.4	6.2	7.4	4.9	4.90	30.054	. .	29.197
	22	O. Arg. S. 5615 . .	6.0	3	III–VII	86 5 2.2	3.1	8.9	7.2	8.8	5.9	6.02	31.080	. .	30.223
	23	Anon. $6^h 48^m 31^s$.	8.5	3	III–VII	83 5 0.7	1.1	6.8	4.7	4.8	3.1	3.53	29.609	. .	28.751
	24	Anon. $6^h 56^m 52^s$.	. .	3	V–IX	89 20 2.9	5.2	9.8	8.5	8.9	7.2	7.08	36.000	. .	35.150
	25	O. Arg. S. 6343 . .	7.7	3	III–VII	89 20 3.4	5.2	9.8	7.6	8.9	7.0	6.98	33.607	. .	32.751
	26	Anon. $7^h 13^m 24^s$.	8.0	3	III–VII	88 30 2.2	3.0	7 8	4.2	7.0	5.1	4.88	29.520	. .	28.663
	27	Anon. $7^h 21^m 13^s$.	9.2	3	III–VII	43 20 1.7	3.0	6.7	4.8	5.8	6.2	4.70	30.546	. .	29.681
	28	Anon. $7^h 29^m 50^s$.	8.0	3	III–VII	37 14 58.3	59.2	63.7	60.9	63.7	60.2	61.00	32.428	. .	31.562
	29	Anon. $7^h 42^m 50^s$.	8.5	3	III–VII	82 20 1.2	2.7	6.3	6.0	5.7	4.0	4.32	32.239	. .	31.381
	30	Lacaille 3061 . .	7.0	2	VII, IX	90 5 4.1	6.3	11.6	10.1	9.7	7.2	8.17	34.055	. .	33.211
	31	8 Cancri	5.5	3	III–VII	45 25 1.5	3.4	8.7	7.1	7.8	5.8	5.72	31.530	. .	30.666
	32	Lacaille 3257 . .	6.0	3	III–VII	93 55 1.3	3.3	6.2	6.3	5.5	4.0	4.43	32.678	. .	31.823
	33	Anon. $8^h 24^m 10^s$.	9.0	3	III–VII	88 50 1.8	4.7	6.8	6.3	6.2	5.1	5.15	34.260	. .	33.404
	34	O. Arg. S. 8806 . .	8.0	3	III–VII	84 50 2.1	3.2	9.1	10.2	7.2	6.0	6.30	28.349	. .	27.492
	35	Anon. $8^h 49^m 50^s$.	. .	3	III–VII	93 50 4.7	9.2	10.7	12.8	12.7	8.2	9.72	27.063	. .	26.208
	36	Nadir	. .	.	. .	199 59 57.2	59.8	64.1	65.7	62.6	62.4	61.97	30.775	. .	. .
16	37	Lacaille 2027 . .	. .	3	III–VII	88 35 2.9	4.0	6.9	5.0	7.2	5.9	5.32	28.667	−0.870	27.802
	38	Lacaille 2271 . .	. .	3	III–VII	88 30 3.2	4.7	6.9	5.2	8.3	8.0	6.05	32.356	. .	31.491
	39	Lacaille 2323 . .	. .	3	III–VII	86 10 2.8	4.1	7.9	7.8	9.1	7.5	6.53	30.035	. .	29.170
	40	O. Arg. S. 5615 . .	. .	3	III–VII	86 5 2.9	3.8	8.2	8.2	9.9	6.9	6.65	30.948	. .	30.083
	41	O. Arg. S. 5906 . .	. .	3	III–VII	87 44 59.3	59.8	62.1	61.1	62.2	62.1	61.10	32.695	. .	31.830
	42	O. Arg. S. 6343 . .	. .	3	III–VII	89 20 3.6	4.9	7.4	6.5	7.2	6.1	5.95	33.266	. .	32.402
	43	Anon. $7^h 13^m 22^s$.	. .	3	III–VII	88 30 3.8	6.2	9.2	7.2	9.1	8.1	7.27	29.372	. .	28.508
	44	Anon. $7^h 23^m 25^s$.	. .	3	III–VII	18 10 3.3	4.4	9.8	6.8	8.8	5.6	6.45	29.722	. .	28.844
	45	Nadir	. .	.	. .	200 0 1.2	1.2	4.9	4.8	4.5	5.2	3.63	30.836	. .	. .
18	46	Lacaille 2342 . .	. .	3	III–VII	84 35 3.2	8.3	11.2	13.9	9.7	6.1	8.73	28.987	−0.836	28.156
	47	Lacaille 2454 . .	. .	3	III–VII	86 55 2.9	6.2	10.2	12.9	9.1	6.0	7.88	29.312	. .	28.481
	48	O. Arg. S. 5906 . .	7.5	3	III–VII	87 40 2.3	6.0	9.0	10.3	7.2	5.0	6.63	23.562	. .	22.731
	49	O. Arg. S. 6004 . .	. .	3	III–VII	" " "	"	"	"	"	"	"	33.292	. .	32.461
	50	Nadir	. .	.	. .	200 0 3.0	7.4	10.9	12.7	6.9	5.5	7.73	30.935	. .	. .
22	51	Anon. $6^h 52^m 15^s$.	8.0	3	III–VII	89 35 1.8	6.8	9.1	9.1	7.3	4.0	6.35	31.344	−0.849	30.501
	52	Anon. $7^h 2^m 28^s$.	9.0	1	V	73 30 4.9	10.2	13.9	16.0	12 8	7.4	10.87	31.481	. .	30.632
	53	Anon. $7^h 2^m 37^s$.	8.5	1	IX	" " "	"	"	"	"	"	"	24.170	. .	23.334
	54	Weisse VII, 274. .	8.3	3	III–VII	73 10 0.8	4.8	7 9	11.0	7.4	2.8	5.78	32.719	. .	31.872
	55	Weisse VII, 283. .	7.6	2	VII, IX	" " "	"	"	"	"	"	"	31.367	. .	30.526
	56	Anon. $7^h 23^m 29^s$ . .	8.2	3	III–VII	73 40 2.9	6.2	10.7	13.1	9.1	5.1	7.85	32.897	. .	32.051
	57	Anon. $7^h 34^m 15^s$.	7.5	3	III–VII	48 30 0.1	4.7	8.2	9.9	8.2	3.3	5.73	34.668	. .	33.817
	58	Anon. $7^h 42^m 48^s$.	8.2	3	III–VII	82 20 1.7	6.2	9.1	10.9	7.8	3.9	6.60	32.352	. .	31.507
	59	Lacaille 3061 . .	7.0	3	IV–VI	90 5 3.6	8.0	11.3	11.8	9.3	5.2	8.20	34.155	. .	33.308
	60	8 Cancri	. .	3	III–VII	45 25 2.2	7.0	11.8	11.6	9.2	4.0	7.63	31.576	. .	30.725
	61	Lacaille 3209 . .	6.5	3	III–VII	90 15 1.1	6.2	7.9	9.8	6.2	1.9	5.52	35.233	. .	34.390
	62	Anon. $8^h 24^m 13^s$.	8.2	3	III–VII	88 50 5.1	9.8	11.2	14.3	11.8	7.9	10.02	34.529	. .	33.686
	63	O. Arg. S. 8806 . .	7.5	3	III–VII	84 49 59.1	63.3	67.6	69.4	65.6	62.1	64.52	28.355	. .	27.511
	64	Anon. $8^h 49^m 26^s$.	8.5	3	III–VII	93 44 58.6	62.5	65.1	68.5	64.8	59.4	66.15	28.026	. .	27.184
	65	O. Arg. S. 9276 . .	. .	3	III–VII	89 19 59.2	63.2	65.9	67.1	64.2	60.1	63.28	25.947	. .	25.104
	66	Weisse (2) IX, 79 .	8.5	2	I, IX	38 20 3.7	9.8	14.3	15.9	12.2	7.0	10.48	28.947	−0.849	28.080

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	− 42.0	S. 48 9 27.2	1 7.8	− 9 16 56.2	+ 3.7	Y.	
2	30.100	37.2	30.5	− 10.6	80 4 50.6	5 36.4	− 41 16 48.2	+ 7.6	Y.	
3	30.100	37.0	30.2	+ 54.5	18 21 6.0	20.2	+ 20 32 12.6	− 0.9	Y.	
4	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
5	29.916	45.0	39.2	− 1 31.1	74 33 33.3	3 32.0	− 35 43 26.5	+ 8.2	Y.	
6	. .	. .	. .	− 14.4	73 19 52.0	3 16.0	− 34 29 29.2	+ 8.0	Y.	
7	. .	. .	. .	+ 18.4	18 45 22.6	20.2	+ 20 7 56.0	− 8.0	Y.	
8	. .	. .	. .	+ 11.5	0 0 12.9	0.0	+ 38 53 25.9	− 14.3	Y.	
9	29.918	44.5	39.0	− 16.2	68 24 49.9	2 29.2	− 29 33 40.3	+ 7.0	Y.	
10	. .	. .	. .	+ 1 37.2	62 11 42.1	1 52.3	− 23 19 55.6	+ 5.6	Y.	
11	. .	. .	. .	+ 33.4	62 5 38.8	1 51.9	− 23 13 51.9	+ 5.6	Y.	
12	29.920	3.6	37.6	− 1 4.6	67 44 1.6	2 24.6	− 28 52 47.4	+ 6.9	Y.	
13	. .	. .	. .	− 1 34.2	S. 11 58 33.2	12.7	+ 26 54 52.9	− 8.5	Y.	
14	. .	. .	. .	− 1 58.6	N. 6 11 53.0	6.5	+ 45 5 38.3	− 13.9	Y.	
15	. .	. .	. .	+ 1 15.4	S. 4 1 18.0	4.2	+ 34 52 16.6	− 10.1	Y.	
16	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	Cloudy.
17	29.984	52.2	47.7	+ 59.4	68 36 3.5	2 28.2	− 29 44 52.9	+ 7.0	Y.	March 11. Burnished the reflector to the microscopes.
18	. .	. .	. .	+ 1 4.8	68 36 8.9	2 28.3	− 29 44 58.4	+ 7.0	Y.	
19	. .	. .	. .	− 2 6.4	68 28 1.5	2 27.4	− 29 36 50.1	+ 7.0	Y.	
20	. .	. .	. .	− 54.5	68 29 13.4	2 27.8	− 29 38 2.4	+ 7.0	Y.	
21	. .	. .	45.8	+ 25.1	66 10 30.0	2 12.2	− 27 19 3.4	+ 6.6	Y.	
22	. .	. .	. .	− 7.0	66 4 59.0	2 11.9	− 27 13 32.1	+ 6.6	Y.	
23	. .	. .	. .	+ 39.1	63 5 42.6	1 55.7	− 24 13 59.5	+ 6.0	Y.	
24	30.000	50.0	42.5	− 2 41.4	69 17 25.7	2 35.2	− 30 26 22.1	+ 7.3	Y.	
25	. .	. .	. .	− 1 26.2	69 18 40.8	2 35.5	− 30 27 37.5	+ 7.4	Y.	
26	. .	. .	. .	+ 41.9	68 30 46.8	2 29.4	− 29 39 37.4	+ 7.2	Y.	
27	. .	. .	. .	+ 10.0	23 20 14.7	25.6	+ 15 32 58.5	− 4.6	Y.	
28	. .	. .	. .	− 49.0	17 14 12.0	18.4	+ 21 39 8.4	− 6.3	Y.	
29	30.014	48.0	40.0	− 43.3	62 19 21.0	1 53.0	− 23 27 35.2	+ 6.0	Y.	Followed by star to northward.
30	. .	. .	. .	− 1 40.6	70 3 27.5	2 42.7	− 31 12 31.4	+ 7.6	Y.	
31	. .	. .	. .	− 20.9	25 24 44.8	28.3	+ 13 28 25.7	− 2.7	Y.	
32	30.034	46.5	39.0	− 57.1	73 54 7.3	3 24.0	− 35 3 52.5	+ 8.2	Y.	
33	. .	. .	. .	− 1 46.7	68 48 18.5	2 32.8	− 29 57 12.5	+ 7.5	Y.	
34	. .	. .	. .	+ 1 18.6	64 51 24.9	2 6.7	− 25 59 52.8	+ 7.0	Y.	
35	30.050	45.2	38.0	+ 1 58.8	73 52 8.6	3 24.1	− 35 1 53.9	+ 8.1	Y.	
36	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
37	29.610	54.7	49.6	+ 1 8.9	68 36 14.2	2 25.8	− 29 45 1.2	+ 7.1	Y.	
38	. .	. .	. .	− 46.7	68 29 19.3	2 25.2	− 29 38 5.7	+ 7.2	Y.	
39	29.610	54.0	48.5	+ 26.0	66 10 32.5	2 9.9	− 27 19 3.6	+ 6.7	Y.	
40	. .	. .	. .	− 2.6	66 5 4.1	2 9.4	− 27 13 34.7	+ 6.8	Y.	
41	29.610	53.0	48.0	− 57.3	67 44 3.8	2 20.1	− 28 52 45.1	+ 7.2	Y.	
42	. .	. .	. .	− 1 15.3	69 18 50.6	2 31.8	− 30 27 43.6	+ 7.6	Y.	Star very diffuse.
43	29.624	52.5	47.3	+ 46.7	S. 68 30 54.0	2 25.9	− 29 39 41.1	+ 7.5	Y.	
44	. .	. .	. .	+ 36.2	N. 1 49 17.3	1.8	+ 40 42 57.9	− 12.9	Y.	
45	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
46	30.236	41.3	33.0	+ 57.8	S. 64 36 6.5	2 7.5	− 25 44 35.2	+ 6.5	Y.	
47	. .	. .	. .	+ 47.6	66 55 55.5	2 22.1	− 28 4 38.8	+ 7.1	Y.	
48	. .	. .	. .	+ 3 47.8	67 43 54.4	2 27.8	− 28 52 43.4	+ 7.3	Y.	
49	30.234	40.5	32.0	− 1 17.2	67 38 49.5	2 27.2	− 28 47 37.9	+ 7.4	Y.	
50	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
51	30.196	38.0	30.0	− 15.7	69 34 50.7	2 42.9	− 30 43 54.8	+ 8.0	Y.	
52	. .	. .	. .	− 19.8	53 29 51.1	1 22.4	− 14 37 34.7	+ 4.3	Y.	
53	. .	. .	. .	+ 3 28.9	53 33 39.8	1 22.7	− 14 41 23.7	+ 4.3	Y.	
54	. .	. .	. .	− 58.7	53 9 7.1	1 21.5	− 14 16 49.8	+ 4.3	Y.	
55	30.194	37.2	29.7	− 16.5	53 9 49.3	1 21.5	− 14 17 32.0	+ 4.3	Y.	
56	. .	. .	. .	− 1 4.3	53 39 3.6	1 23.0	− 14 46 47.8	+ 4.7	Y.	
57	. .	. .	. .	− 1 59.6	28 28 6.1	33.2	+ 10 24 59.5	− 2.6	Y.	
58	30.200	36.5	29.3	− 47.2	62 19 19.4	1 56.3	− 23 27 36.9	+ 7.1	Y.	
59	. .	. .	. .	− 1 43.7	70 3 24.5	2 47.4	− 31 12 33.1	+ 8.7	Y.	
60	. .	. .	. .	− 22.7	25 24 44.9	29.1	+ 13 28 24.8	− 2.7	Y.	
61	30.210	36.0	29.1	− 2 17.6	70 12 47.9	2 48.9	− 31 21 58.0	+ 8.9	Y.	
62	. .	. .	. .	− 1 55.5	68 48 14.5	2 36.9	− 29 57 12.6	+ 8.8	Y.	
63	. .	. .	. .	+ 1 18.0	64 51 22.5	2 10.0	− 25 59 53.7	+ 8.3	Y.	
64	30.220	35.0	28.6	+ 1 28.2	73 46 34.4	3 28.2	− 34 56 23.8	+ 9.7	Y.	
65	. .	. .	. .	+ 2 33.4	69 22 36.7	2 41.9	− 30 31 39.8	+ 9.2	Y.	
66	. .	. .	. .	+ 1 0.2	S. 18 21 10.7	20.4	+ 20 32 7.7	− 1.7	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. Mar. 22	1	Weisse (2) IX, 81	9.0	1	V	38 20 3.7	9.8	14.3	15.9	12.2	7.0	10.48	31.470	−0.849	30.621
	2	Anon. $9^{h}\,14^{m}\,48^{s}$	8.3	3	III–VII	87 35 1.8	6.2	9.5	11.2	8.5	3.9	6.85	30.712	. .	29.868
	3	Anon. $9^{h}\,25^{m}\,27^{s}$	8.2	3	III–VII	94 55 4.0	9.3	13.1	14.8	11.0	5.4	9.60	29.703	. .	28.861
	4	Anon. $9^{h}\,33^{m}\,6^{s}$	8.5	2	VII, IX	88 45 1.3	8.2	9.2	11.9	8.2	2.8	6.93	29.878	. .	29.047
	5	Anon. $9^{h}\,44^{m}\,48^{s}$	7.5	3	V–IX	40 50 5.1	11.1	13.2	16.7	11.8	9.1	11.17	32.617	. .	31.761
	6	Nadir	. .	.	. .	199 59 59.1	64.3	66.8	69.3	63.0	61.9	64.07	30.830	. .	. .
25	7	γ Canis Majoris	. .	2	VII, IX	74 20 6.2	7.6	12.5	12.0	14.2	10.6	10.52	32.476	−0.831	31.654
	8	Anon. $7^{h}\,5^{m}\,53^{s}$	8.2	3	IV–VI	73 40 1.0	3.4	6.9	7.4	8.6	4.9	5.37	29.162	. .	28.332
	9	Anon. $7^{h}\,15^{m}\,28^{s}$	8.5	3	III–VII	73 19 59.1	62.5	65.4	66.1	67.1	62.5	63 78	36.370	. .	35.541
	10	Weisse (2) VII, 667	8.2	3	III–VII	43 20 2.9	6.2	7.7	7.0	9.7	5.2	6.45	26.378	. .	25.544
	11	Weisse (2) VII, 682	8.0	2	VIII, IX	" " "	"	"	"	"	"	"	33.644	. .	32.8[illegible]2
	12	Anon. $7^{h}\,45^{m}\,50^{s}$	8.8	3	III–VII	58 24 58.0	62.3	63.0	63.3	67.2	64.0	62 97	28.575	. .	27.744
	13	8 Cancri	5.5	3	III–VII	45 25 0.0	2.1	5.5	3.8	7.7	2.1	3.53	31.378	. .	30.545
	14	Lacaille 3168	6.5	3	III–VII	96 10 4.0	8.8	10.8	10.3	12.8	7.8	9.08	33.413	. .	32.589
	15	31 Lyncis	4.5	3	III–VII	15 20 2.1	4.3	7.2	4.4	7.3	3.8	4.85	34.201	. .	33.361
	16	Anon. $8^{h}\,29^{m}\,11^{s}$	8.5	3	III–VII	31 20 2.7	4.8	7.8	9.2	11.4	7.1	7.17	33.592	. .	32.756
	17	Anon. $8^{h}\,34^{m}\,30^{s}$	. .	2	VII, IX	38 19 57.7	59.4	. .	63.2	. .	61.4	61.59	36.490	. .	35.647
	18	Anon. $8^{h}\,49^{m}\,26^{s}$	8.5	3	III–VII	93 45 2.5	5.8	6.2	10.2	9.7	5.7	6.68	27.916	. .	27.092
	19	Lacaille 3643	7.0	3	V–IX	84 55 2.3	6.3	9.6	11.0	11.8	7.3	8.05	27.991	. .	27.170
	20	Weisse (2) IX, 79	8.5	2	I, IX	38 20 0.0	3.8	6.7	6.2	7.8	3.9	4.73	28.789	. .	27.940
	21	Weisse (2) IX, 81	9.0	2	IV, VI	" " "	"	"	"	"	"	"	31.680	. .	30.847
	22	Anon. $9^{h}\,14^{m}\,45^{s}$	9.0	3	III–VII	87 35 3.4	6.4	8.2	10.1	11.8	6.2	7.68	30.966	. .	30.140
	23	Anon. $9^{h}\,25^{m}\,28^{s}$	9.0	3	III–VII	94 55 3.3	9.1	11.0	12.9	11.8	8.0	9.35	29.723	. .	28.899
	24	Weisse (2) IX, 817	8.0	3	III–VII	31 10 1.7	5.0	9.0	10.3	10.3	5.9	7.03	32.343	. .	31.507
	25	Anon. $9^{h}\,47^{m}\,51^{s}$	8.5	3	III–VII	39 30 3.8	9.7	11.2	14.2	14.6	9.8	10.55	35.439	. .	34.605
	26	Anon. $10^{h}\,2^{m}\,20^{s}$	7.0	2	V, VI	8 50 58.4	63.8	66.2	64.5	66.8	61.5	63.53	37.632	. .	36.798
	27	Groombridge 1618	6.0	2	V, VI	" " "	"	"	"	"	"	"	33.575	. .	32.741
	28	Nadir	. .	.	. .	200 0 2.0	6.1	9.0	8.9	7.4	5.0	6.40	30.886	. .	. .
Apr. 5	29	B. A. C. 2599	6.5	3	III–VII	83 30 0.4	59.4	3.7	2.8	2.3	3.9	2.08	34.876	−0.855	34.025
	30	Lacaille 3093	7.0	3	III–VII	95 29 59.4	57.9	63.8	61.5	62.5	62.8	61.32	29.535	. .	28.687
	31	Lacaille 3168	6.0	3	III–VII	96 10 1.2	0.7	4.7	3.9	4.4	3 7	3.10	32.906	. .	32.058
	32	Lacaille 3257	5.5	3	III–VII	93 55 0.6	59.4	3.1	2.8	3.9	3.1	2.15	32.262	. .	31.414
	33	Anon. $8^{h}\,21^{m}\,2^{s}$	6.5	3	III–VII	85 35 2.0	0.3	5.8	5.9	4.8	5.1	3.98	29.537	. .	28.687
	34	Anon. $8^{h}\,28^{m}\,51^{s}$	7.5	3	V–IX	34 25 3.3	3.2	8.3	7.2	7.2	8.0	6.20	32.068	. .	31.203
	35	Anon. $8^{h}\,44^{m}\,47^{s}$	9.0	2	V, IX	100 5 0.1	59.2	2.2	1.8	1.6	1.9	1.13	33.078	. .	32.244
	36	B. A. C. 3082	6.5	3	III–VII	85 0 1.9	1.2	7.2	6.2	5.7	6.3	4.75	26.963	. .	26.113
	37	Weisse (2) IX, 81	. .	3	III–VII	38 20 0.7	59.4	5.6	4.4	4.7	5.7	3.42	31.519	. .	30.660
	38	Anon. $9^{h}\,16^{m}\,4^{s}$	7.5	3	III–VII	93 40 1.1	1.7	4.2	5.8	4.3	4.4	3.58	30.554	. .	29.706
	39	Lacaille 3905	7.0	3	III–VII	96 55 0.7	1.3	5.8	4.0	3.4	4.2	3.23	31.093	. .	30.246
	40	Anon. $9^{h}\,40^{m}\,18^{s}$	8.0	3	III–VII	96 0 1.3	1.7	7.2	5.7	6.1	6.0	4.67	31.825	. .	30.977
	41	Anon. $9^{h}\,42^{m}\,7^{s}$	8.0	3	V–IX	" " "	"	"	"	"	"	"	33.370	. .	32.531
	42	B. A. C. 3405	6.0	3	III–VII	91 40 4.8	3.9	8.1	8.3	7.5	6.8	6.57	30.070	. .	29.221
	43	Anon. $10^{h}\,7^{m}\,49^{s}$	8.3	3	III–VII	88 40 2.8	3.0	7.8	7.0	5.7	7.2	5.58	30.868	. .	30.019
	44	30 Leonis Minoris	5.0	3	III–VII	24 29 58.8	58.8	63.8	62.7	61.5	61.4	61.17	35.440	. .	34.578
	45	34 Leonis Minoris	. .	3	III–VII	23 14 59.2	58.7	63.9	61.3	63.0	62.6	61.45	29.665	. .	28.803
	46	Weisse X, 716	9.2	3	III–VII	46 20 1.9	3.2	7.2	5.9	5.7	5.2	4.85	30.663	. .	29.806
	47	Weisse X, 957	7.0	3	III–VII	54 30 3.1	2.8	6.8	7.9	6.0	6.0	5.43	33.990	. .	33.134
	48	Nadir	. .	.	. .	199 59 58.3	57.8	63.4	63.2	61.4	63.1	61.20	30.744	. .	. .
6	49	B. A. C. 2599	6.5	3	III–VII	83 30 0.9	59.8	3.8	4.3	2.8	4.8	2.73	34.889	−0.864	34.029
	50	Lacaille 3093	7.0	3	III–VII	95 30 0.7	58.2	4.1	2.9	3.4	4.7	2.33	29.506	. .	28.649
	51	Lacaille 3168	7.0	3	III–VII	96 10 2.8	1.7	5.9	5.8	5.4	5.7	4.55	32.888	. .	32.031
	52	Lacaille 3257	5.5	3	III–VII	93 55 3.2	1.8	5.2	6.2	6.3	6.3	4.83	32.329	. .	31.472
	53	Anon. $8^{h}\,21^{m}\,2^{s}$	6.5	3	III–VII	85 35 0.1	58.3	3.7	3.2	2.8	3.8	1.98	29.470	. .	28.611
	54	Anon. $8^{h}\,27^{m}\,25^{s}$	8.5	3	III–VII	34 25 3.2	1.7	6.9	7.2	7.2	7.8	5.67	27.084	. .	26.216
	55	Anon. $8^{h}\,35^{m}\,16^{s}$	8.5	3	III–VII	90 35 2.9	2.7	6.0	5.5	5.5	6.1	4.78	31.364	. .	30.506
	56	Weisse (2) VIII, 1252	. .	3	III–VII	37 14 58.1	56.2	60.9	59.4	60.8	61.6	59.50	32.214	. .	31.346
	57	B. A. C. 3121	. .	3	III–VII	84 15 3.5	3.8	8.8	7.1	7.6	7.9	6.45	34.639	. .	33.780
	58	Lacaille 3690	. .	2	VII, IX	" " "	"	"	"	"	"	"	37.024	. .	36.173
	59	α Lyncis	. .	3	III–VII	24 0 2.6	0.8	7.2	4.8	6.3	6.9	4.77	34.301	. .	33.430
	60	λ Leonis	. .	3	III–VII	35 25 3.2	2.8	7.7	7.3	7.2	7.8	6.00	36.308	. .	35.440
	61	15 Leonis Minoris	. .	3	III–VII	12 20 3.2	2.7	8.7	6.1	8.2	6.3	5.87	35.846	. .	34.972
	62	B. A. C. 3391	6.0	3	III–VII	84 14 59.0	58.6	64.1	61.7	62.8	62.8	61.50	35.632	. .	34.773
	63	η Leonis	. .	3	III–VII	41 30 2.9	3.1	7.2	7.6	7.8	7.4	6.00	29.123	. .	28.256
	64	43 Leonis	6.0	3	III–VII	51 45 2.1	1.8	6.0	6.0	5.7	6.0	4.60	35.753	−0.864	34.888

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
1	. .	. .	. .	− 19.5	S. 18 19 51.0	20.3	+ 20 33 27.5	− 1.7	Y	
2	. .	. .	. .	+ 4.1	67 35 11.0	2 28.0	− 28 44 0.2	+ 9.1	Y.	Followed by a larger star.
3	30.230	34.2	28.2	+ 35.7	74 55 45.3	3 44.8	− 36 5 51.3	+ 10.0	Y.	
4	. .	. .	. .	+ 29.9	68 45 36.8	2 36.9	− 29 54 34.9	+ 9.4	Y.	
5	30.234	34.0	28.1	− 55.2	20 49 16.0	23.4	+ 18 3 59.4	+ 1.2	Y.	
6	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
7	. .	. .	. .	− 51.9	54 19 18.7	1 23.8	− 15 27 3.7	+ 4.4	Y.	
8	30.280	44.0	37.4	+ 52.3	53 40 57.7	1 22.0	− 14 48 40.9	+ 4.4	Y.	
9	. .	. .	. .	− 2 53.7	53 17 10.1	1 20.9	− 14 24 52.2	+ 4.5	Y.	
10	. .	. .	. .	+ 2 19.7	23 22 26.1	26.1	+ 15 30 46.6	− 4.7	Y.	
11	30.280	43.5	35.8	− 1 27.8	23 18 38.6	26.1	+ 15 34 34.1	− 4.7	Y.	
12	. .	. .	. .	+ 1 10.7	38 26 13.7	48.1	+ 0 26 37.0	+ 0.8	Y.	
13	. .	. .	. .	− 17.1	25 24 46.5	28.8	+ 13 28 23.5	− 2.9	Y.	
14	30.280	42.2	35.2	− 1 21.1	S. 76 8 47.9	4 1.5	− 37 19 10.6	+ 10.1	Y.	
15	. .	. .	. .	− 1 45.3	N. 4 41 40.5	5.0	+ 43 35 24.3	− 11.8	Y.	
16	. .	. .	. .	− 1 26.4	S. 11 18 40.8	12.1	+ 27 34 45.9	− 6.0	Y.	Saw one only.
17	. .	. .	. .	− 2 57.0	18 17 4.6	20.1	+ 20 36 14.1	− 3.5	Y.	+1″.17 applied to mean of A, B, D, and E.
18	30.296	41.0	32.5	+ 1 31.1	73 46 37.8	3 27.0	− 34 56 26.0	+ 11.4	Y.	
19	. .	. .	. .	+ 1 28.7	64 56 36.7	2 9.9	− 26 5 7.8	+ 8.9	Y.	
20	. .	. .	. .	+ 1 4.6	18 21 9.3	20.3	+ 20 32 9.2	− 1.8	Y.	
21	. .	. .	. .	− 26.5	18 19 38.2	20.2	+ 20 33 40.4	− 1.9	Y.	
22	30.292	40.0	31.7	− 4.4	67 35 3.3	2 27.2	− 28 43 51.7	+ 9.5	Y.	
23	. .	. .	. .	+ 34.5	74 55 43.8	3 43.7	− 36 5 48.7	+ 10.5	Y.	
24	. .	. .	. .	− 47.2	11 9 19.8	12.2	+ 27 44 6.8	− 1.7	Y.	
25	. .	. .	. .	− 2 24.3	S. 19 27 46.2	21.6	+ 19 25 31.0	+ 0.9	Y.	
26	. .	. .	. .	− 3 33.0	N. 11 13 29.5	12.2	+ 50 7 20.5	− 5.3	Y.	
27	30.290	38.0	30.4	− 1 25.9	N. 11 11 22.4	12.1	+ 50 5 13.3	− 5.2	Y.	
28	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
29	30.266	60.5	56.3	− 2 6.1	S. 63 27 56 0	1 55.7	− 24 36 12.9	+ 7.9	Y.	
30	. .	. .	. .	+ 41.2	75 30 42.5	3 40.8	− 36 40 44.5	+ 10.6	Y.	
31	30.260	60.2	55.7	− 1 4.5	76 8 58.6	3 51.2	− 37 19 11.0	+ 10.9	Y.	
32	. .	. .	. .	− 44.3	73 54 17.8	3 18.6	− 35 3 57.6	+ 10.7	Y.	
33	. .	. .	. .	+ 41.1	65 35 45.1	2 7.4	− 26 44 13.7	+ 9.2	Y.	
34	30.260	60.0	55.0	− 37.7	14 24 28.5	14.9	+ 24 28 55.4	− 5.8	Y.	
35	. .	. .	. .	− 1 10.3	80 3 50.8	5 20.4	− 41 15 32.4	+ 12.3	Y.	Two stars preceding.
36	. .	. .	. .	+ 2 1.8	65 2 6.6	2 4.4	− 26 10 32.2	+ 9.9	Y.	
37	. .	. .	. .	− 20.7	18 19 42.7	19.3	+ 20 33 36.8	− 2.7	Y.	
38	30.280	59.0	54.8	+ 9.2	73 40 12.8	3 16.1	− 34 49 50.1	+ 11.8	Y.	
39	. .	. .	. .	− 7.7	76 54 55.5	4 5.4	− 38 5 22.1	+ 12.4	Y.	
40	. .	. .	. .	− 30.6	75 59 34.0	3 49.4	− 37 9 44.6	+ 12.4	Y.	
41	. .	. .	. .	− 1 19.3	75 58 45.3	3 49.3	− 37 8 55.8	+ 12.4	Y.	
42	. .	. .	. .	+ 24.4	71 40 31.0	2 54.3	− 32 49 46.5	+ 11.9	Y.	
43	30.280	58.0	53.7	− 0.6	68 40 5.0	2 28.3	− 29 48 54.5	+ 11.7	Y.	
44	. .	. .	. .	− 2 23.5	4 27 37.7	4.6	+ 34 25 56.5	− 2.0	Y.	
45	. .	. .	. .	+ 37.5	3 15 39.0	3.3	+ 35 37 56.5	− 1.8	Y.	
46	. .	. .	. .	+ 6.1	26 20 10.9	29.0	+ 12 32 58.9	+ 4.9	Y.	
47	30.286	57.2	52.0	− 1 38.2	34 28 27.2	40.2	+ 4 24 31.4	+ 7.2	Y.	
48	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
49	30.184	61.3	57.3	− 2 6.3	63 27 56.5	1 55.1	− 24 36 12.8	+ 7.9	Y.	
50	. .	. .	. .	+ 42.3	75 30 44.7	3 39.9	− 36 40 45.8	+ 10.7	Y.	
51	30.190	61.0	56.6	− 1 3.7	76 9 0.9	3 50.3	− 37 19 12.4	+ 11.0	Y.	
52	. .	. .	. .	− 46.1	73 54 18.7	3 17.9	− 35 3 57.8	+ 10.8	Y.	
53	30.192	61.0	56.0	+ 43.5	65 35 45.5	2 7.0	− 26 44 13.7	+ 9.3	Y.	
54	. .	. .	. .	+ 1 58.6	14 27 4.3	14.9	+ 24 26 19.6	− 5.9	Y.	
55	. .	. .	. .	− 15.8	70 34 48.9	2 43.0	− 31 43 53.1	+ 10.6	Y.	
56	30.190	60.5	54.8	− 42.2	17 14 17.3	18.0	+ 21 39 3.5	− 3.8	Y	
57	. .	. .	. .	− 1 58.5	64 13 8.0	1 59.7	− 25 21 28.9	+ 9.9	Y.	
58	. .	. .	. .	− 3 13.5	64 11 53.0	1 59.6	− 25 20 13.8	+ 9.9	Y.	
59	. .	. .	. .	− 1 47.5	3 58 17.3	4.0	+ 34 55 17.5	− 6.9	Y.	
60	. .	. .	. .	− 2 50.5	S. 15 22 15.5	16.0	+ 23 31 7.3	− 2.7	Y.	
61	. .	. .	. .	− 2 35.8	N. 7 42 29.9	7.9	+ 46 36 16.6	− 8.5	Y.	
62	30.196	59.2	52.3	− 2 29.6	S. 64 12 31.9	2 0.2	− 25 20 53.3	+ 10.8	Y.	
63	. .	. .	. .	+ 54.7	21 31 0.7	23.0	+ 17 22 15.1	+ 1.2	Y.	
64	. .	. .	. .	− 2 33.2	S. 31 42 31.4	36.1	+ 7 10 31.3	+ 4.7	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. Apr. 6	1	34 Leonis Minoris . .	. .	3	III–VII	23 15 3.8	4.8	9.1	8.4	8.8	8.0	7.15	29.859	−0.864	28.988
	2	33 Sextantis	6.5	3	III–VII	60 0 0.8	0.7	6.7	5.0	4.7	5.9	3.97	34.705	. .	33.841
	3	39 Sextantis	7.0	3	III–VII	67 20 1.3	3.1	8.2	7.1	4.8	6.6	5.18	32.763	. .	31.900
	4	Lalande 21081 . .	7.2	3	III–VII	22 9 58.8	59.8	64.4	63.8	62.8	63.2	62.13	35.205	. .	34.334
	5	p^5 Leonis	. .	3	V–IX	58 15 0.2	1.4	5.8	7.4	5.2	6.3	4.38	28.315	. .	27.450
	6	Nadir	. .	.	. . .	200 0 1.1	1.4	5.8	6.9	2.8	6.7	4.12	30.847	. .	. .
8	7	B. A. C. 3070 . .	. .	3	III–VII	87 10 0.8	1.1	6.2	7.4	4.3	4.7	4.08	29.244	−0.801	28.448
	8	20 Hydræ	. .	3	III–VII	67 10 0.2	0.0	5.1	6.3	3.4	4.2	3.20	31.685	. .	30.885
	9	Anon. $9^h 15^m 3^s$ . .	. .	3	III–VII	87 30 3.3	3.4	7.2	8.4	6.2	6.2	5.78	36.057	. .	35.261
	10	λ Leonis	. .	3	III–VII	35 25 0.0	59.3	4.5	3.3	3.1	2.9	2.18	36.139	. .	35.334
	11	Anon. $9^h 40^m 44^s$.	6.5	3	III–VII	46 45 0.4	0.7	5.7	5.7	5.2	4.0	3.62	31.980	. .	31.177
	12	Lacaille 4095. . .	6.0	3	III–VII	94 10 2.5	2.8	7.6	9.2	5.2	6.1	5.57	34.591	. .	33.797
	13	Anon. $10^h 2^m 23^s$.	7.0	3	III–VII	8 45 2.8	4.1	8.9	9.5	8.4	6.8	6.75	28.246	. .	27.434
	14	43 Leonis	7.0	3	III–VII	51 45 3.1	4.8	9.2	11.2	8.2	9.0	7.58	35.807	. .	35.005
	15	30 Leonis Minoris . .	6.0	3	III–VII	24 29 58.5	59.8	64.9	64.9	62.2	61.0	61.88	35.428	. .	34.620
	16	35 Leonis Minoris . .	6.5	3	III–VII	21 54 58.8	59.3	64.7	63.9	63.5	63.1	62.22	30.671	. .	29.863
	17	39 Sextantis	. .	3	IV–VI	67 20 2.2	2.4	8.2	8.8	4.5	6.0	5.35	32.690	. .	31.889
	18	Lalande 21081 . .	6.0	3	III–VII	22 10 0.0	59.2	5.4	4.4	3.3	2.6	2.48	35.183	. .	34.375
	19	Anon. $11^h 1^m 16^s$.	. .	3	V–IX	91 45 2.1	5.1	8.1	9.4	6.2	5.5	6.07	33.543	. .	32.755
	20	φ Leonis	4.0	3	III–VII	61 50 0.2	58.9	3.8	3.9	2.2	2.5	1.92	28.907	. .	28.107
	21	ι Leonis	5.0	3	III–VII	47 40 1.4	1.2	5.5	5.8	4.2	5.0	3.85	30.550	. .	29.747
	22	Lacaille 4773 . .	. .	3	III–VII	87 19 59.4	60.8	63.8	65.7	62.3	63.6	62.60	33.414	. .	32.618
	23	Lacaille 4867 . .	. .	3	III–VII	87 55 2.7	4.4	7.2	10.0	6.4	6.1	6.13	31.400	. .	30.604
	24	B. A. C. 4015 . .	5.0	3	III–VII	92 5 2.8	6.4	9.9	12.5	8.3	7.0	7.82	33.649	. .	32.854
	25	Weisse (2) XI, 1013.	6.5	3	III–VII	24 59 59.2	59.8	63.2	64.1	60.2	61.2	61.28	27.301	. .	26.494
	26	Nadir	. .	.	. .	200 0 0.8	1.9	6.7	8.4	3.2	5.9	4.48	30.794	. .	. .
14	27	B. A. C. 2846 . .	. .	3	III–VII	84 35 4.9	5.4	11.2	11.6	9.8	9.1	8.67	30.925	−0.689	30.241
	28	δ Hydræ	. .	3	III–VII	52 45 4.7	2.8	7.9	8.6	7.8	8.1	6.65	31.288	. .	30.598
	29	Anon. $8^h 50^m 1^s$ . .	8.5	3	III–VII	91 50 0.0	59.3	4.1	5.2	3.8	3.9	2.72	34.850	. .	34.167
	30	Lacaille 3595. . .	7.5	2	VII, IX	" " "	"	"	"	"	"	"	37.602	. .	36.931
	31	Weisse (2) IX, 81 .	9.0	3	V–IX	38 20 1.2	0.3	5.9	7.2	5.5	6.1	4.37	31.521	. .	30.823
	32	Weisse IX, 337 . .	8.2	3	III–VII	73 50 3.7	3.9	9.1	11.1	8.3	7.1	7.20	30.786	. .	30.100
	33	Lacaille 3905. . .	7.0	3	III–VII	96 55 3.3	4.6	9.1	8.9	7.7	7.3	6.82	31.020	. .	30.339
	34	B. A. C. 3306 . .	6.5	3	I–V	97 50 0.0	0.8	3.2	3.9	3.1	3.4	2.40	26.132	. .	25.461
	35	Anon. $9^h 33^m 58^s$.	8.0	2	VI, VIII	" " "	"	"	"	"	"	"	35.846	. .	35.169
	36	Lacaille 4089. . .	. .	3	IV–VI	87 35 0.8	1.3	5.3	7.4	5.3	5.6	4.28	32.736	. .	32.049
	37	Anon. $10^h 2^m 23^s$.	7.5	3	III–VII	8 45 3.7	5.4	8.2	10.3	7.9	7.0	7.08	28.114	. .	27.414
	38	μ Hydræ	5.0	3	III–VII	75 4 59.1	59.2	63.7	64.9	63.1	63.5	62.25	31.958	. .	31.272
	39	Anon. $10^h 29^m 25^s$.	9.0	3	III–VII	62 50 0.8	1.2	4.0	7.6	4.3	5.9	3.97	29.994	. .	29.306
	40	37 Sextantis	. .	3	III–VII	51 50 0.8	1.8	5.1	8.2	5.2	6.6	4.62	28.424	. .	27.734
	41	B. A. C. 3726 . .	. .	3	III–VII	57 10 oblit.	58.4	2.8	3.9	3.2	4.2	1.66	27.392	. .	26.703
	42	B. A. C. 3773 . .	7.0	3	III–VII	58 10 2.2	3.7	7.4	10.2	8.3	8.9	6.78	30.991	. .	30.302
	43	p^5 Leonis	. .	3	III–VII	58 15 3.3	3.3	6.8	9.5	8.4	9.1	6.73	28.189	. .	27.500
	44	B. A. C. 3875 . .	5.5	3	V–IX	94 20 2.0	1.5	5.1	7.6	5.6	5.9	4.62	32.350	. .	31.675
	45	Lalande 21902 . .	. .	3	III–VII	21 55 5.1	6.8	9.7	12.8	9.8	9.9	9.02	26.450	. .	25.754
	46	Nadir	. .	.	. . .	199 59 57.6	58.7	62.2	65.2	60.2	62.4	61.05	30.570	. .	. .
20	47	δ Hydræ	. .	3	III–VII	52 45 2.6	2.6	7.1	8.6	6.3	7.1	5.72	31.364	−0.710	30.653
	48	35 Lyncis	. .	3	III–VII	14 45 1.1	1.1	4.8	5.1	4.1	3.2	3.23	36.265	. .	35.546
	49	B. A. C. 3082 . .	. .	3	III–VII	85 0 2.2	4.5	9.1	11.1	7.9	8.1	7.15	26.851	. .	26.146
	50	36 Lyncis	. .	3	III–VII	15 10 1.9	2.8	6.5	6.9	5.6	5.3	4.83	31.482	. .	30.763
	51	Anon. $9^h 17^m 42$. .	. .	3	V–IX	93 50 0.0	0.2	2.9	4.9	3.8	3.2	2.50	31.335	. .	30.639
	52	Anon. $9^h 34^m 2^s$.	8.2	3	V–IX	97 49 57.4	59.1	62.4	63.1	62.3	61.9	61.03	35.818	. .	35.124
	53	Anon. $9^h 42^m 22^s$.	7.5	3	III–VII	96 25 0.1	2.4	5.7	7.2	5.1	3.5	4.00	27.815	. .	27.112
	54	Anon. $9^h 48^m 40^s$.	8.0	3	V–IX	39 30 0.2	0.8	4.0	6.7	4.5	4.8	3.50	33.709	. .	32.991
	55	Anon. $9^h 55^m 53^s$.	8.2	3	V–IX	97 40 0.2	4.3	6.4	8.2	5.5	5.1	4.95	37.618	. .	36.924
	56	γ^2 Leonis	. .	3	III–VII	38 25 1.2	3.8	8.3	10.0	7.2	7.8	6.38	30.974	. .	30.260
	57	Anon. $10^h 22^m 42^s$.	7.5	3	III–VII	94 25 4.2	7.8	9.8	13.3	10.2	9.8	9.18	30.334	. .	29.631
	58	Weisse X, 608 . .	8.5	3	III–VII	44 20 4.7	6.1	10.0	11.2	8.2	8.0	8.03	35.409	. .	34.697
	59	B. A. C. 3726 . .	. .	3	III–VII	57 10 oblit.	1.8	5.0	7.4	5.4	6.1	2.46	27.516	. .	26.806
	60	B. A. C. 3773 . .	7.0	3	III–VII	58 9 59.7	62.9	65.8	68.0	67.2	67.0	65.10	30.967	. .	30.257
	61	Anon. $11^h 2^m 7^s$ . .	8.5	3	III–VII	99 4 59.3	63.8	64.7	66.9	63.4	62.9	63.50	31.661	. .	30.959
	62	B. A. C. 3875 . .	. .	3	III–VII	94 20 1.0	2.0	5.1	8.5	4.6	4.1	4.22	32.341	. .	31.638
	63	Lalande 21902 . .	6.5	3	III–VII	21 55 3.9	6.8	10.0	13.0	9.8	8.3	8.63	26.498	. .	25.781
	64	O. Arg. S. 11531. .	8.5	3	III–VII	83 45 3.7	7.4	10.2	14.1	8.9	8.3	8.77	29.467	−0.710	28.761

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	+ 31.7	S. 3 15 38.9	3.3	+ 35 37 56.6	− 1.9	Y.	
2	. .	. .	. .	− 2 0.4	39 58 3.6	48.9	− 1 5 13.7	+ 7.5	Y.	
3	30.190	58.0	51.2	− 59.5	47 19 5.6	1 3.3	− 8 26 30.1	+ 9.2	Y.	
4	. .	. .	. .	− 2 15.9	2 7 46.3	2.2	+ 36 45 50.3	− 0.1	Y.	
5	. .	. .	50.7	+ 1 19.9	38 16 24.3	46.2	+ 0 36 28.3	+ 8.5	Y.	
6	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
7	30.066	56.3	52.2	+ 48.6	67 10 52.7	2 17.3	− 28 19 31.2	+ 10.6	Y.	
8	. .	. .	. .	− 27.7	47 9 35.5	1 2.7	− 8 16 59.4	+ 6.0	Y.	
9	. .	. .	51.2	− 2 44.9	67 27 20.9	2 19.4	− 28 36 1.5	+ 11.1	Y.	
10	. .	. .	. .	− 2 47.1	15 22 15.0	16.0	+ 23 31 7.8	− 2.7	Y.	
11	. .	. .	. .	− 36.9	26 44 26.7	29.4	+ 12 8 42.7	+ 1.7	Y.	
12	30.074	56.0	50.3	− 1 59.1	S. 74 8 6.5	3 22.5	− 35 17 50.2	+ 12.8	Y.	
13	. .	. .	. .	+ 1 20.4	N. 11 13 32.8	11.6	+ 50 7 23.2	− 7.9	Y.	
14	. .	. .	. .	− 2 36.9	S. 31 42 30.7	36.1	+ 7 10 32.0	+ 4.8	Y.	
15	. .	. .	. .	− 2 24.8	4 27 37.1	4.6	+ 34 25 57.1	− 2.3	Y.	
16	. .	. .	. .	+ 4.3	1 55 6.5	2.0	+ 36 58 30.3	− 2.2	Y.	
17	30.066	55.3	49.6	− 59.2	47 19 6.2	1 3.3	− 8 26 30.7	+ 9.4	Y.	
18	. .	. .	. .	− 2 17.1	2 7 45.4	2.2	+ 36 45 51.2	− 0.3	Y.	
19	. .	. .	. .	− 1 26.3	71 43 39.7	2 55.2	− 32 52 56.1	+ 13.2	Y.	
20	. .	. .	. .	+ 59.3	41 51 1.2	52.4	− 2 58 14.8	+ 9.4	Y.	
21	. .	. .	. .	+ 8.0	27 40 11.8	30.7	+ 11 12 56.3	+ 7.1	Y.	
22	30.070	55.0	48.4	− 1 22.1	67 18 40.5	2 19.2	− 28 27 20.9	+ 13.0	Y.	
23	. .	. .	. .	− 19.0	67 54 47.2	2 23.3	− 29 3 31.7	+ 13.1	Y.	
24	. .	. .	. .	− 1 29.4	72 3 38.4	2 58.8	− 33 12 58.4	+ 13.3	Y.	
25	30.064	55.0	49.1	+ 1 49.9	5 1 51.2	5.2	+ 33 51 42.4	+ 5.3	Y.	
26	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
27	. .	. .	. .	− 7.6	64 35 1.1	2 1.2	− 25 43 23.5	+ 9.4	Y.	
28	29.905	53.2	51.5	− 18.7	32 44 47.9	37.2	+ 6 8 13.7	+ 0.2	Y.	
29	. .	. .	. .	− 2 10.6	71 47 52.1	2 54.7	− 32 57 8.0	+ 11.7	Y.	
30	29.910	53.0	50.2	− 3 37.2	71 46 25.5	2 54.5	− 32 55 41.2	+ 11.7	Y.	
31	. .	. .	. .	− 25.8	18 19 38.6	19.3	+ 20 33 40.9	− 3.2	Y.	
32	. .	. .	. .	− 3.1	53 50 4.1	1 19.6	− 14 57 44.9	+ 8.3	Y.	
33	. .	. .	. .	− 10.6	76 54 56.2	4 5.7	− 38 5 23.1	+ 13.5	Y.	
34	. .	. .	. .	+ 2 22.3	77 52 24.7	4 25.1	− 39 3 11.0	+ 13.7	Y.	
35	29.930	52.2	48.2	− 2 42.0	77 47 20.4	4 23.3	− 38 58 4.9	+ 13.7	Y.	
36	. .	. .	. .	− 1 4.2	S. 67 34 0.1	2 20.5	− 28 42 41.8	+ 12.3	Y.	
37	. .	. .	. .	+ 1 21.1	N. 11 13 31.9	11.6	+ 50 7 22.3	− 8.9	Y.	
38	29.936	51.3	46.3	− 39.9	S. 55 4 22.4	1 23.7	− 16 12 7.3	+ 10.5	Y.	
39	. .	. .	. .	+ 21.7	42 50 25.7	54.3	− 3 57 41.2	+ 8.0	Y.	
40	. .	. .	. .	+ 1 11.0	31 51 15.6	36.4	+ 7 1 46.8	+ 5.6	Y.	
41	. .	. .	. .	+ 1 43.3	37 11 45.0	44.5	+ 1 41 9.3	+ 7.3	Y.	−0″.41 applied to mean of B, C, D, and E.
42	. .	. .	. .	− 9.5	38 9 57.3	46.1	+ 0 42 55.4	+ 7.9	Y.	
43	29.928	50.0	45.4	+ 1 18.4	38 16 25.1	46.3	+ 0 36 27.4	+ 8.4	Y.	
44	. .	. .	. .	− 52.5	74 19 12.1	3 26.1	− 35 28 59.4	+ 14.3	Y.	
45	. .	. .	. .	+ 2 13.1	1 57 22.1	2.0	+ 36 56 14.7	+ 1.2	Y.	
46	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
47	29.884	49.2	45.0	− 20.5	S. 32 44 45.3	37.7	+ 6 8 15.8	+ 0.2	Y.	
48	. .	. .	. .	− 2 53.8	N. 5 17 50.6	5.4	+ 44 11 34.8	− 12.5	Y.	
49	29.880	48.7	44.0	+ 2 0.8	S. 65 2 7.9	2 5.5	− 26 10 34.6	+ 10.8	Y.	
50	. .	. .	. .	− 23.9	N. 4 50 19.1	5.0	+ 43 44 2.9	− 11.3	Y.	
51	. .	. .	. .	− 20.0	S. 73 49 42.5	3 20.3	− 34 59 24.0	+ 13.3	Y.	
52	29.894	48.0	43.4	− 2 40.6	77 47 20.4	4 25 6	− 38 58 7.2	+ 14.4	Y.	
53	. .	. .	. .	+ 1 30.5	76 26 34.5	3 59.8	− 37 36 55.5	+ 14.4	Y.	
54	. .	. .	. .	− 1 33.7	19 28 29.8	20.8	+ 19 24 48.2	− 0.9	Y.	
55	29.914	47.5	42.9	− 3 37.0	77 36 28.0	4 22.3	− 38 47 11.5	+ 14.9	Y.	
56	. .	. .	. .	− 8.1	18 24 58.2	19.6	+ 20 28 21.0	+ 0.1	Y.	
57	. .	. .	. .	+ 11.6	74 25 20.7	3 28.6	− 35 35 10.5	+ 14.8	Y.	Only star.
56	. .	. .	. .	− 2 27 2	24 17 40.8	26.6	+ 14 35 31.4	+ 3.2	Y.	−1″.52 applied to mean of C, D, E, and F.
59	29.906	47.0	42.0	+ 1 40.1	37 11 42.6	44.8	+ 1 41 11.4	+ 7.3	Y.	
60	. .	. .	. .	− 8.1	38 9 57.0	46.4	+ 0 42 55.4	+ 7.9	Y.	
61	. .	. .	. .	− 30.1	79 4 33.4	4 57.6	− 40 15 52.2	+ 15.9	Y.	
62	29.920	46.3	41.2	− 51.3	74 19 12.9	3 27.9	− 35 29 2.0	+ 15.4	Y.	
63	. .	. .	. .	+ 2 12.2	1 57 20.8	2.0	+ 36 56 16.0	+ 0.4	Y.	
64	. .	. .	. .	+ 38.8	S. 63 45 47.6	1 59.7	− 24 54 8.5	+ 14.2	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
1875.						° ′ ″	″	″	″	″	″	″	r.	r.	r.
Apr. 20	1	Weisse (2) XI, 812	8.2	3	III–VII	43 40 3.0	5.9	7.9	10.8	6.8	7.8	7.03	28.533	−0.710	27.820
	2	Weisse XI, 947	8.5	3	III–VII	50 20 0.3	2.9	5.4	7.6	4.8	5.5	4.42	26.992	. .	26.281
	3	Lacaille 5044.	6.5	3	III–VII	83 5 2.7	5.5	8.9	11.9	7.3	6.3	7.10	25.690	. .	24.984
	4	Nadir	. .	.	. .	200 0 2.6	4.4	7.6	12.4	5.2	7.9	6.68	30.772	. .	. .
21	5	B. A. C. 3082	. .	3	III–VII	85 0 2.9	3.8	8.7	11.1	7.1	8.4	7.00	26.868	−0.694	26.179
	6	O. Arg. S. 9418	. .	3	III–VII	88 10 1.2	2.0	4.2	6.9	4.3	5.5	4.02	30.686	. .	29.997
	7	Lalande 18288	7.2	3	III–VII	23 0 0.0	0.4	3.3	7.3	3.5	3.3	2.97	30.345	. .	29.644
	8	Anon. 9h 17m 42s.	7.8	3	III–VII	93 50 2.3	3.3	4.5	9.0	5.7	6.8	5.27	31.440	. .	30.753
	9	O. Arg. S. 9938	9.0	3	III–VII	82 45 1.2	1.7	4.2	8.9	2.8	4.1	3.82	31.845	. .	31.155
	10	Weisse (2) IX, 960	9.0	3	III–VII	40 55 4.1	6.9	10.1	14.1	9.5	12.3	9.50	33.575	. .	32.878
	11	Anon. 9h 55m 51s	8.2	3	III–VII	97 35 1.2	5.0	7.1	9.5	5.7	5.2	5.62	28.208	. .	27.522
	12	Weisse X, 94	8.5	3	III–VII	46 35 3.8	4.2	7.2	9.6	7.3	5.9	6.33	31.372	. .	30.676
	13	μ Hydræ	. .	3	III–VII	75 5 0.7	3.5	7.1	10.3	5.7	5.3	5.43	32.095	. .	31.404
	14	Anon. 10h 25m 51s	9.2	3	V–IX	41 20 1.3	4.1	7.6	10.4	6.4	7.4	6.20	30.980	. .	30.278
	15	Weisse X, 608	8.5	3	IV–VI	44 20 4.7	6.8	10.2	12.3	8.4	7.7	8.35	35.039	. .	34.344
	16	O. Arg. S. 10936	8.8	3	III–VII	88 15 0.9	3.7	5.5	9.5	4.3	5.1	4.83	28.149	. .	27.460
	17	Anon. 10h 57m 38s	7.5	3	III–VII	58 15 2.1	6.2	8.2	13.1	8.7	9.7	8.00	31.986	. .	31.292
	18	O. Arg. N. 11619	9.0	3	IV–VI	349 0 4.0	7.4	12.6	15.4	8.9	7.7	9.33	27.580	. .	26.878
	19	Rumker 3575	9.5	3	III–VII	40 20 0.9	4.2	6.9	10.3	5.3	6.4	5.67	29.981	. .	29.284
	20	Lacaille 4773	7.0	3	III–VII	87 20 3.8	6.7	9.9	14.0	8.4	8.9	8.62	32.525	. .	32.836
	21	Carrington 1741	8.0	1	V	337 40 3.0	5.0	10.3	10.6	7.2	6.9	7.17	34.688	. .	33.994
	22	Weisse (2) XI, 812	8.0	3	III–VII	43 40 1.9	5.3	7.8	10.9	5.6	6.2	6.28	28.476	. .	27.779
	23	Weisse (2) XI, 1013.	6.0	3	III–VII	25 0 2.3	5.9	9.3	12.4	5.6	6.0	6.92	27.430	. .	26.730
	24	Weisse (2) XI, 1190.	8.5	3	III–VII	21 10 3.6	5.7	8.4	12.0	7.3	6.0	7.17	28.985	. .	28.284
	25	Rumker 3911	7.5	2	III, VII	52 29 58.1	59.5	63.6	66.5	62.3	62.4	62.07	28.294	. .	27.599
	26	Nadir	. .	.	. .	199 59 58.0	61.1	63.8	67.4	60.0	62.8	62.18	30.614	. .	. .
22	27	ξ Cancri	. .	3	III–VII	36 20 1.7	0.5	4.8	5.2	5.3	4.3	3.63	30.225	−0.698	29.523
	28	α Lyncis	4.5	3	III–VII	24 0 0.4	59.4	4.0	4.2	3.6	3.3	2.48	34.077	. .	33.372
	29	ω Leonis	. .	3	III–VII	49 20 1.8	2.3	5.4	6.9	7.5	7.0	5.15	36.374	. .	35.674
	30	B. A. C. 3296	. .	3	III–VII	90 30 5.3	4.8	8.5	9.3	7.3	7.5	7.12	34.363	. .	33.671
	31	15 Leonis Minoris	5.5	3	III–VII	12 20 3.1	3.7	8.8	7.9	8.0	6.6	6.35	35.751	. .	35.043
	32	B. A. C. 3385	6.5	3	IV–VI	85 35 3.4	2.9	8.1	9.8	7.4	8.0	6.60	27.850	. .	27.154
	33	Lacaille 4115	. .	3	III–VII	88 50 0.4	0.4	3.4	5.4	4.1	5.6	3.22	30.9 8	. .	30.306
	34	B. A. C. 3489	. .	3	III–VII	85 15 1.2	0.2	4.1	6.8	5.2	5.9	3.90	27.985	. .	27.292
	35	Lacaille 4250	. .	3	III–VII	91 20 5.0	7.2	9.5	10.5	9.5	9.1	8.47	28.868	. .	28.176
	36	B. A. C. 3596	. .	3	III–VII	87 55 3.0	3.7	5.9	8.0	5.5	6.7	5.47	34.729	. .	34.036
	37	Weisse X, 608	. .	3	III–VII	44 20 2.8	3.7	7.9	8.3	6.1	6.0	5.80	34.968	. .	34.268
	38	B. A. C. 3755	5.0	3	III–VII	95 20 1.1	2.4	6.1	7.1	5.6	5.1	4.57	34.273	. .	33.582
	39	p^3 Leonis	5.5	3	III–VII	56 15 3.8	4.8	10.2	11.2	9.7	9.2	8.15	30.909	. .	30.211
	40	φ Leonis	4.5	3	III–VII	61 50 2.4	3.5	6.7	8.8	7.0	6.9	5.88	28.893	. .	28.196
	41	ι Leonis	5.0	3	III–VII	47 40 1.2	0.2	4.1	6.0	3.9	5.0	3.40	30.450	. .	29.750
	42	B. A. C. 3928	4.5	3	III–VII	90 0 0.0	0.8	3.2	4.8	1.4	2.9	2.18	28.472	. .	27.780
	43	Lacaille 4867	7.0	3	III–VII	87 55 2.8	3.8	6.7	9.2	4.8	6.2	5.58	31.240	. .	30.547
	44	B. A. C. 4015	5.0	3	III–VII	92 5 0.2	1.8	5.1	6.8	2.7	3.5	3.35	33.389	. .	32.697
	45	Anon. 11h 56m 22s	8.5	3	III–VII	50 20 4.2	5.9	10.1	11.7	8.8	10.2	8.48	27.098	. .	26.399
	46	B. A. C. 4128	5.5	3	III–VII	25 10 3.5	3.9	8.3	11.7	6.2	6.3	6.65	34.712	. .	34.008
	47	Nadir	. .	.	. .	200 0 1.1	2.9	4.9	8.9	3.2	6.8	4.63	30.696	. .	. .
23	48	B. A. C. 3121	. .	3	III–VII	84 15 1.1	1.7	4.7	4.8	5.3	6.1	3.95	34.316	−0.691	33.630
	49	B. A. C. 3174	. .	3	III–VII	97 40 4.8	3.8	6.8	8.4	6.8	8.1	6.45	26.451	. .	25.768
	50	Lacaille 3834.	. .	3	III–VII	92 10 0.2	0.2	3.8	5.7	3.3	4.7	2.98	26.501	. .	25.816
	51	Lacaille 3946.	. .	3	III–VII	94 25 1.7	1.2	5.2	6.3	4.9	5.6	4.15	35.351	. .	34.667
	52	Weisse (2) IX, 817	8.0	3	III–VII	31 10 3.3	2.1	6.2	5.8	7.4	7.9	5.45	32.164	. .	31.468
	53	B. A. C. 3391	. .	3	III–VII	84 10 1.1	1.7	4.9	5.2	5.3	6.5	4.12	25.898	. .	25.212
	54	Lacaille 4111	. .	3	V–IX	92 25 1.6	1.0	4.2	5.8	3.8	5.0	3.57	30.371	. .	29.693
	55	γ^2 Leonis	. .	3	III–VII	38 25 4.9	4.4	9.2	8.9	10.2	10.2	7.97	31.005	. .	30.310
	56	Lacaille 4286	. .	3	III–VII	87 25 0.7	59.4	2.7	4.4	3.2	5.1	2.58	30.384	. .	29.698
	57	37 Leonis Minoris	. .	3	III–VII	26 15 1.7	2.8	5.1	5.3	5.6	5.8	4.38	28.915	. .	28.218
	58	Weisse (2) X, 776	8.5	3	III–VII	22 35 3.4	4.3	6.7	7.7	7.1	8.0	6.20	29.264	. .	28.566
	59	Anon. 10h 47m 18s	8.5	3	III–VII	59 35 1.6	2.0	4.1	6.9	4.8	7.9	4.55	31.837	. .	31.146
	60	B. A. C. 3778	6.5	3	III–VII	85 0 3.9	3.8	9.5	10.1	8.4	10.2	7.65	28.738	. .	28.052
	61	Anon. 11h 15m 59s	7.5	3	III–VII	23 10 1.0	1.7	4.5	4.1	5.7	5.8	3.80	29.078	. .	28.380
	62	B. A. C. 3928.	5.0	3	III–VII	90 0 3.0	5.0	6.8	7.3	6.3	7.5	5.98	28.526	. .	27.841
	63	Anon. 11h 38m 19s	8.5	3	III–VII	20 15 2.8	3.3	8.4	7.9	7.8	6.9	6.18	27.727	. .	27.028
	64	B. A. C. 4015.	5.5	3	III–VII	92 5 2.1	3.7	7.2	8.8	6.5	6.9	5.87	33.355	−0.691	32.670

Number.	Barometer.	THERM'S. At.	THERM'S. Ex.	Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
	in.	°	°	' "	° ' "	' "	° ' "	"		
1	. .	. .	. .	+ 1 8.3	S. 23 41 15.3	26.0	+ 15 11 57.5	+ 6.8	Y.	
2	. .	. .	. .	+ 1 56.6	30 22 1.0	34.7	+ 8 31 3.1	+ 9.0	Y.	
3	29.924	45.8	40.1	+ 2 37.2	63 7 44.3	1 56.5	− 24 16 2.0	+ 14.5	Y.	
4	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
5	29.950	48.0	44.3	+ 1 59.7	65 2 6.8	2 5.8	− 26 10 33.8	+ 10.8	Y.	
6	. .	. .	. .	+ 0.1	68 10 4.1	2 26.0	− 29 18 51.3	+ 11.8	Y.	
7	. .	. .	. .	+ 11.1	3 0 14.1	3.1	+ 35 53 21.6	− 8.5	Y.	
8	29.950	47.3	43.3	− 23.6	73 49 41.7	3 20.7	− 34 59 23.6	+ 13.4	Y.	
9	. .	. .	. .	− 36.2	62 44 27.6	1 54.0	− 27 52 42.8	+ 12.3	Y.	
10	. .	. .	. .	− 1 30.2	20 53 39.3	22.5	+ 17 59 37.0	− 0.6	Y.	
11	29.970	47.0	42.5	+ 1 17.7	77 36 23.3	4 22.8	− 38 47 7.3	+ 15.0	Y.	
12	. .	. .	. .	− 21.2	26 34 45.1	29.6	+ 12 18 24.1	+ 2.3	Y.	
13	. .	. .	. .	− 44.0	55 4 21.4	1 24.6	− 16 12 7.2	+ 10.9	Y.	
14	. .	. .	. .	− 8.7	21 19 57.5	23.1	+ 17 33 18.2	+ 1.7	Y.	
15	. .	. .	. .	− 2 16.2	24 17 52.2	26.7	+ 14 35 19.9	+ 3.1	Y.	
16	29.980	46.0	41.3	+ 1 19.6	68 16 24.4	2 27.7	− 29 25 13.3	+ 14.3	Y.	
17	. .	. .	. .	− 40.5	S. 38 14 27.5	46.7	+ 0 38 24.6	+ 8.1	Y.	
18	. .	. .	. .	+ 1 37.9	N. 30 58 12.8	35.6	+ 69 52 27.2	− 8.8	Y.	
19	. .	. .	. .	+ 22.4	S. 20 20 28.1	22.0	+ 18 32 48.7	+ 4.6	Y.	
20	29.980	45.3	40.5	− 1 28.9	S. 67 18 39.7	2 21.1	− 28 27 22.0	+ 14.7	Y.	
21	. .	. .	. .	− 2 5.1	N. 42 21 58.0	54.1	+ 81 16 30.9	− 8.4	Y.	
22	. .	. .	. .	+ 1 9.6	S. 23 41 15.9	26.1	+ 15 11 56.8	+ 6.7	Y.	
23	. .	. .	. .	+ 1 42.5	5 1 49.4	5.2	+ 33 51 44.2	+ 3.1	Y.	
24	. .	. .	. .	+ 53.8	1 11 1.0	1.2	+ 37 42 36.6	+ 2.9	Y.	
25	29.984	45.0	39.3	+ 1 15.3	32 30 17.4	37.9	+ 6 22 43.5	+ 10.2	Y.	
26	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
27	29.944	52.0	47.2	+ 14.9	16 20 18.6	17.1	+ 22 33 3.1	− 4.4	Y.	
28	. .	. .	. .	− 1 45.7	3 58 16.8	4.1	+ 34 55 17.9	− 8.2	Y.	
29	. .	. .	. .	− 2 57.8	29 17 7.3	32.8	+ 9 35 58.7	+ 0.9	Y.	
30	29.946	51.5	46.4	− 1 55.1	S. 70 28 12.1	2 43.7	− 31 37 17.0	+ 13.1	Y.	
31	. .	. .	. .	− 2 38.1	N. 7 42 31.7	7.9	+ 46 36 18.4	− 10.4	Y.	
32	. .	. .	. .	+ 1 29.2	S. 65 36 35.8	2 8.6	− 26 45 5.6	+ 12.5	Y.	
33	29.955	51.2	45.7	− 9.6	68 49 53.6	2 30.4	− 29 58 45.2	+ 13.4	Y.	
34	. .	. .	. .	+ 1 24.9	65 16 28.8	2 6.8	− 26 24 56.8	+ 13.0	Y.	
35	. .	. .	. .	+ 57.1	71 21 5.6	2 52.3	− 32 30 19.1	+ 14.3	Y.	
30	29.956	50.6	45.0	− 2 6.5	67 52 59.0	2 23.6	− 29 1 43.8	+ 13.9	Y.	
37	. .	. .	. .	− 2 13.8	24 17 52.0	26.6	+ 14 35 20.2	+ 3.0	Y.	
38	29.964	50.2	42.6	− 1 52.3	75 18 12.3	3 41.6	− 36 28 15.1	+ 15.6	Y.	
39	. .	. .	. .	− 6.6	36 15 1.5	43.3	+ 2 37 54.0	+ 7.7	Y.	
40	. .	. .	. .	+ 56.6	41 51 2.4	52.9	− 2 58 16.5	+ 9.4	Y.	
41	. .	. .	. .	+ 7.8	27 40 11.2	31.0	+ 11 12 56.6	+ 6.2	Y.	
42	29.956	49.0	42.6	+ 1 9.6	70 1 11.7	2 41.1	− 31 10 14.0	+ 15.2	Y.	
43	. .	. .	. .	− 17.1	67 54 48.5	2 24.6	− 29 3 34.3	+ 15.1	Y.	
44	. .	. .	. .	− 1 24.5	72 3 38.8	3 0.7	− 33 13 0.7	+ 15.6	Y.	
45	. .	. .	. .	+ 1 52.9	30 22 1.4	34.6	+ 8 31 2.8	+ 8.9	Y.	
46	29.950	48.0	41.3	− 2 5.6	5 8 1.1	5.3	+ 33 45 32.4	+ 4.3	Y.	
47	. .	. .	. .	. .	. . . .	. . .	. . . .	. .	Y.	
48	29.714	54.8	52.7	− 1 53.8	64 13 10.2	1 58.3	− 25 21 29.7	+ 10.7	Y.	
49	. .	. .	. .	+ 2 12.6	77 42 19.1	4 17.3	− 38 52 57.6	+ 14.0	Y.	
50	29.710	54.7	52.4	+ 2 11.1	72 12 14.1	2 56.9	− 33 21 32.2	+ 13.2	Y.	
51	. .	. .	. .	− 2 26.2	74 22 37.9	3 22.5	− 35 32 21.6	+ 13.9	Y.	
52	. .	. .	. .	− 46.0	11 9 19.4	11.4	+ 27 44 8.0	− 4.4	Y.	
53	29.718	54.5	50.4	+ 2 30.1	64 12 34.2	1 58.8	− 25 20 54.2	+ 12.2	Y.	
54	. .	. .	. .	+ 9.6	72 25 13.2	3 0.1	− 33 34 34.5	+ 14.1	Y.	Faint.
55	. .	. .	. .	+ 9.7	18 24 58.2	19.2	+ 20 28 21.4	− 0.2	Y.	
56	29.730	54.0	49.3	+ 9.5	67 25 12.0	2 18.1	− 28 33 51.3	+ 13.7	Y.	
57	. .	. .	. .	+ 55.8	6 16 0.2	6.4	+ 32 37 32.2	− 2.8	Y.	
58	. .	. .	. .	+ 44.9	2 35 51.1	2.6	+ 36 17 45.1	− 3.4	Y.	
59	29.724	53.8	47.8	− 35.9	39 34 28.6	47.9	− 0 41 37.7	+ 7.9	Y.	
60	. .	. .	. .	+ 1 1.0	65 1 8.7	2 3.9	− 26 9 33.8	+ 14.1	Y.	
61	. .	. .	. .	+ 50.8	3 10 54.6	3.2	+ 35 42 41.0	− 0.6	Y.	
62	29.732	53.0	47.2	+ 1 7.7	70 1 13.6	2 38.4	− 31 10 13.2	+ 15.4	Y.	
63	. .	. .	. .	+ 1 33.1	0 16 39.3	0.3	+ 38 36 59.2	+ 0.4	Y.	
64	29.730	52.5	46.4	− 1 23.7	S. 72 3 42.2	2 57.7	− 33 13 1.1	+ 15.7	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. Apr. 23	1	Weisse (2) XI, 1079	8.0	2	I, IX	15 5 4.0	3.9	8.9	8.5	6.6	7.9	6.63	33.762	−0.691	33.024
	2	Weisse (2) XI, 1086	7.5	3	IV–VI	“ “ “	“	“	“	“	“	“	29.257	. .	28.563
	3	Lacaille 5143	7.0	3	III–VII	84 9 57.7	57.9	61.5	62.1	61.2	60.8	60.20	31.425	. .	30.739
	4	Weisse (2) XII, 556	6.5	3	III–VII	33 54 58.5	58.8	62.8	63.6	61.5	63.5	61.45	30.492	. .	29.797
	5	Lalande 23666	7.2	3	III–VII	24 5 1.3	3.2	6.8	7.1	5.6	5.8	4.97	35.659	. .	34.961
	6	Nadir	. .	.	. .	200 0 1.8	3.9	6.9	9.8	5.7	8.4	6.08	30.736	. .	. .
29	7	ψ Leonis	. .	3	III–VII	44 20 6.2	5.2	9.8	10.8	10.8	11.2	9.00	35.434	−0.724	34.708
	8	B. A. C. 3385	6.0	3	III–VII	85 35 2.1	59.3	5.6	5.3	4.5	6.9	3.95	27.590	. .	26.871
	9	Weisse (2) IX, 1172	7.0	3	III–VII	20 15 2.3	0.2	6.8	5.3	5.8	6.3	4.45	29.216	. .	28.484
	10	Anon. $10^h\ 7^m\ 22^s$	8.5	3	III–VII	88 40 5.0	5.2	9.0	9.5	8.4	10.2	7.88	30.590	. .	29.872
	11	Lalande 20114	6.5	3	III–VII	81 55 1.2	0.3	4.0	4.1	4.3	6.0	3.32	26.933	. .	26.213
	12	O. Arg. N. 10874	. .	3	IV–VI	2 15 1.8	0.4	6.1	5.4	6.2	6.8	4.45	30 061	. .	29.332
	13	Anon. $10^h\ 37^m\ 3^s$	9.0	3	III–VII	94 39 59.2	58.4	62.7	64.5	62.9	64.4	62.02	28.825	. .	28.108
	14	Anon. $10^h\ 48^m\ 13^s$	7.5	3	III–VII	59 44 58.7	57.9	61.2	62.2	63.1	65.2	61.38	32 368	. .	31.644
	15	B. A. C. 3778	. .	3	III–VII	85 0 1.3	0 3	5 9	6.7	4.8	7.1	4.35	28.569	. .	27.852
	16	O. Arg. N. 11590	8.0	1	V	349 0 4.7	3.8	10.5	10.2	9.1	9.3	7.93	30.889	. .	30.165
	17	80 Leonis	. .	3	III–VII	54 19 57.9	56.6	60.1	60.3	61.5	62.2	59.77	30.247	. .	29.522
	18	Weisse (2) XI, 511	9.0	3	III–VII	42 10 4.2	6.5	8.8	9.7	9.2	11.2	8.27	28.614	. .	27.887
	19	Anon. $11^h\ 38^m\ 10^s$	8.8	3	III–VII	20 15 1.2	1.4	6.2	5.9	5.2	5.2	4.18	27.762	. .	27.030
	20	Weisse (2) XI, 1079	. .	3	III–VII	15 5 3.4	3.6	7.2	7.8	6.4	6.7	5.85	33.773	. .	33.040
	21	Weisse (2) XI, 1086	. .	2	I, IX	“ “ “	“	“	“	“	“	“	29.312	. .	28.541
	22	O. Arg. S. 11982	7.0	3	IV–VI	84 5 2.9	4.2	9.1	10.8	7.8	9.9	7.45	27.751	. .	27.028
	23	Lacaille 5125	7.0	3	IV–VI	83 0 2.1	2.2	5.8	7.8	5.2	6.1	4.87	25.517	. .	24.794
	24	6 Corvi	6.0	2	VII, IX	“ “ “	“	“	“	“	“	“	29.238	. .	28.526
	25	28 Virginis	6.5	3	III–VII	65 40 0.8	59.8	4.4	5.2	3.8	5.4	3.23	27.629	. .	26.906
	26	Anon. $12^h\ 42^m\ 39^s$	9.0	3	III–VII	40 30 5.0	5.8	9.9	11.8	9.3	12.2	9.00	33.866	. .	33.139
	27	Nadir	. .	.	. .	199 59 54.3	55.3	58.8	60.1	57.1	61.1	57.78	30.502	. .	. .
May 3	28	Nadir	. .	.	. .	199 5 1.9	0.3	4.1	6.0	2.9	6.8	3.67	21.213	. .	. .
	29	Nadir	. .	.	. .	200 0 1.7	1.4	4.9	8.5	3.4	7.9	4.63	30.834	. .	. .
	30	Nadir	. .	.	. .	200 5 4.5	4.4	. .	10.8	. .	10.8	7.42	40.478	. .	. .
	31	Nadir	. .	.	. .	199 55 3.0	3.2	5.8	8.8	5.3	8.9	5.83	21.284	. .	. .
	32	Nadir	. .	.	. .	199 59 59.2	60.2	61.9	65.8	62.2	65.9	62.53	30.754	. .	. .
	33	Nadir	. .	.	. .	200 4 58.9	59.7	62.1	66.9	62.0	66.0	62.60	40.317	. .	. .
10	34	B. A. C. 3677	. .	3	III–VII	90 55 4.2	1.8	6.7	8.1	4.7	9.0	5.75	31.139	−0.741	30.404
	35	Weisse X, 859	7.5	3	III–VII	59 45 1.1	59.8	3.1	2.1	2.6	8.0	2.78	32.463	. .	31.722
	36	Anon. $10^h\ 57^m\ 40^s$	8.2	3	III–VII	58 15 1.3	1.2	4.6	6.6	4.3	10.2	4.70	31.973	. .	31.232
	37	O. Arg. S. 11213	8.5	3	V–IX	87 45 4.4	2.5	6.7	8.0	4.8	9.1	5.92	30.315	. .	29.585
	38	Anon. $11^h\ 14^m\ 54^s$	9.2	1	V	20 39 58.9	57.0	62.1	60.1	60.2	63.2	60.25	28.574	. .	27.833
	39	O. Arg. N. 11873	8.3	3	IV–VI	347 25 3.5	59.8	7.2	6.1	3.4	9.0	4.83	32.019	. .	31.269
	40	B. A. C. 3969	5.0	3	III–VII	90 40 1.9	59.7	4.1	4.4	1.4	5.9	2.90	31.733	. .	30.998
	41	B. A. C. 4021	. .	3	V–IX	53 20 2.6	0.7	4.7	6.3	3.2	8.6	4.35	33.424	. .	32.680
	42	O. Arg. S. 11850	8.5	3	V–IX	84 29 59.2	58.3	63.1	64.2	60.4	65.3	61.75	27.099	. .	26.367
	43	Lalande 5063	. .	3	III–VII	92 14 58.3	56.5	61.3	62.6	58.7	62.4	59.97	27.320	. .	26.585
	44	Lacaille 5125	7.0	3	I–V	83 0 3.3	2.3	6.7	8.7	3.2	8.2	5.40	25.619	. .	24.888
	45	6 Corvi	5.5	2	VII, IX	“ “ “	“	“	“	“	“	“	29.326	. .	28.597
	46	Anon. $12^h\ 26^m\ 55^s$	8.5	3	III–VII	90 34 56.6	55.4	59.6	58.0	56.3	60.6	57.75	26.801	. .	26.069
	47	Lalande 23666	7.5	3	III–VII	24 4 58.2	56.4	61.0	61.3	58.6	62.9	59.73	35.667	. .	34.919
	48	Anon. $12^h\ 45^m\ 55^s$	8.5	3	III–VII	97 30 2.7	3.8	7.4	8.1	4.7	8.3	5.83	35.367	. .	34.634
	49	Anon. $12^h\ 57^m\ 28^s$	8.3	3	III–VII	75 50 4.2	3.3	8.9	10.0	5.8	9.9	7.02	32.246	. .	31.508
	50	Nadir	. .	.	. .	200 0 0.2	58.8	3.8	8.2	59.6	7.3	2.98	30.686	. .	. .
11	51	B. A. C. 3677	. .	3	III–VII	90 55 3.4	59.8	3.7	5.9	3.0	8.4	4.03	31.031	−0.791	30.246
	52	Weisse X, 957	7.5	3	III–VII	54 30 1.1	56.1	59.8	2.2	1.4	5.1	0.95	33.791	. .	32.999
	53	O. Arg. S. 11213	8.5	3	III–VII	87 45 4.1	0.2	4.1	5.4	4.2	9.6	4.60	30.278	. .	29.492
	54	Weisse (2) XI, 257^1	8.5	2	I, IX	21 10 5.3	2.4	6.3	6.9	7.2	11.0	6.52	35.773	. .	34.945
	55	Weisse (2) XI, 257^2	8.5	3	III–VII	“ “ “	“	“	“	“	“	“	36.563	. .	35.765
	56	B. A. C. 3917	. .	3	III–VII	50 10 2.9	59.2	3.5	5.1	4.1	8.7	3.92	34.802	. .	34.010
	57	O. Arg. S. 11531	. .	3	III–VII	83 45 3.8	58.9	4.0	6.0	2.8	8.9	4.07	29.228	. .	28.441
	58	B. A. C. 4021	. .	3	III–VII	53 20 3.9	58.9	2.1	4.9	2.8	9.2	3.63	33.412	. .	32.620
	59	O. Arg. S. 11850	. .	3	III–VII	84 30 4.2	2.1	7.1	7.2	6.7	10.6	6.32	26.904	. .	26.118
	60	Lacaille 5063	6.0	3	III–VII	92 15 3.9	0.6	4.8	4.9	2.8	7.9	4.15	27.420	−0.841	26.585
	61	B. A. C. 4202	. .	3	III–VII	97 9 59.3	58.1	60.9	61.8	58.8	64.9	60.63	29.220	. .	28.387
	62	Lalande 23654	8.5	3	III–VII	24 0 3.0	58.8	5.7	4.4	3.8	8.1	3.97	31.638	. .	30.790
	63	O. Arg. S. 12444	9.0	3	III–VII	84 0 4.7	2.3	7.1	7.2	5.2	10.3	6.13	25.530	. .	24.694
	64	O. Arg. S. 12626	9.5	3	III–VII	73 40 3.9	1.8	6.6	8.9	5.3	9.9	6.07	26.944	. .	26.106
	65	γ Hydræ	. .	3	III–VII	81 25 0.0	57.6	1.2	1.2	59.4	5.6	0.83	34.923	. .	34.086
	66	Anon. $13^h\ 19^m\ 56^s$	8.0	3	III–VII	93 50 2.1	0.2	3.7	5.6	3.5	8.0	3.85	31.141	−0.841	30.307

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	− 1 34.8	N. 4 56 28.1	5.0	+ 43 50 11.9	+ 0.7	Y.	
2	. .	. .	. .	+ 45.0	N. 4 54 8.3	5.0	+ 43 47 52.1	+ 0.7	Y.	
3	. .	. .	. .	− 23.2	S. 64 9 37.0	1 59.8	− 25 17 58.0	+ 15.1	Y.	
4	. .	. .	. .	+ 6.4	13 55 7.8	14.5	+ 24 58 16.5	+ 7.2	Y.	
5	29.724	52.0	44.5	− 2 35.5	4 2 29.5	4.1	+ 34 51 5.2	+ 5.7	Y.	
6	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
7	29.688	58.0	56.3	− 2 27.5	24 17 41.5	25.7	+ 14 35 31.6	− 0.4	Y.	
8	. .	. .	. .	+ 1 38.1	65 36 42.0	2 5.1	− 26 45 8.3	+ 12.7	Y.	
9	. .	. .	. .	+ 47.5	0 15 52.0	0.3	+ 38 37 46.5	− 7.6	Y.	
10	29.670	57.5	54.8	+ 4.0	68 40 11.9	2 25.0	− 29 48 58.1	+ 14.0	Y.	
11	. .	. .	. .	+ 1 58.7	S. 61 57 2.0	1 46.8	− 23 5 10.0	+ 12.7	Y.	
12	. .	. .	. .	+ 20.9	N. 17 44 24.6	18.3	+ 56 38 21.7	− 11.2	Y.	
13	29.664	57.0	53.6	+ 59.3	S. 74 41 1.3	3 25.7	− 35 50 48.2	+ 16.0	Y.	Very faint.
14	. .	. .	. .	− 51.5	39 44 9.8	47.5	− 0 51 18.5	+ 7.8	Y.	
15	. .	. .	. .	+ 1 7.3	S. 65 1 11.7	2 2.3	− 26 9 35.2	+ 14.5	Y.	
16	. .	. .	. .	− 5.2	N. 30 59 57.2	34.4	+ 69 54 10.4	− 10.6	Y.	
17	29.668	56.5	52.5	+ 15.0	S. 34 20 14.7	39.2	+ 4 32 44.9	+ 7.6	Y.	
18	. .	. .	. .	+ 1 6.2	22 11 14.5	23.4	+ 16 42 0.9	+ 4.7	Y.	
19	. .	. .	. .	+ 1 33.1	S. 0 16 37.2	0.3	+ 38 37 1.3	− 0.7	Y.	
20	. .	. .	. .	− 1 35.3	N. 4 56 29.4	5.0	+ 43 50 13.2	− 0.6	Y.	
21	. .	. .	. .	+ 45.7	N. 4 54 8.4	4.9	+ 43 47 52.1	− 0.6	Y.	
22	29.656	56.0	52.2	+ 1 33.1	S. 64 6 40.6	1 57.6	− 25 14 59.4	+ 15.4	Y.	
23	. .	. .	. .	+ 2 43.1	63 2 48.0	1 52.3	− 24 11 1.5	+ 15.4	Y.	
24	. .	. .	. .	+ 46.2	63 0 51.1	1 52.3	− 24 9 4 6	+ 15.4	Y.	
25	. .	. .	. .	+ 1 37.0	45 41 40.2	58.8	− 6 49 0.2	+ 13.0	Y.	
26	. .	. .	. .	− 1 38.4	20 28 30.6	21.5	+ 18 24 46.7	+ 8.5	Y.	
27	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
28	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
29	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
30	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	To mean of A, B, D, and F, apply −0″.20.
31	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
32	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
33	. .	. .	. .	. .	. . . .	. .	. . .	. .		
34	29.900	65.5	61.2	− 12.7	70 54 53.1	2 42.5	− 32 3 56.8	+ 15.9	Y.	
35	. .	. .	. .	− 54.0	39 44 8.8	47.2	− 0 51 17.2	+ 7.4	Y.	
36	. .	. .	. .	− 38.6	38 14 26.1	44.8	+ 0 38 27.9	+ 7.3	Y.	
37	29.908	65.0	59.2	+ 13.0	67 45 18.9	2 18.4	− 28 53 58.5	+ 15.9	Y.	
38	. .	. .	. .	+ 1 7.9	S. 0 41 8.2	0.7	+ 38 12 29.9	− 3.8	Y.	Very faint.
39	. .	. .	. .	− 39.8	N. 32 35 34.9	36.5	+ 71 29 40.2	− 11.1	Y.	
40	29.924	64.4	58.4	− 31.3	S. 70 39 31.6	2 41.3	− 31 48 34.1	+ 17.2	Y.	
41	. .	. .	. .	− 1 24.0	33 18 40.3	37.6	+ 5 34 20.9	+ 8.0	Y.	
42	. .	. .	. .	+ 1 53.9	64 31 55.6	1 59.5	− 25 40 16.3	+ 16.3	Y.	
43	29.940	63.7	57.6	+ 1 47.0	72 16 47.0	2 57.2	− 33 26 5.4	+ 17.9	Y.	
44	. .	. .	. .	+ 2 40.2	63 2 45.6	1 52.2	− 24 10 59.0	+ 16.3	Y.	
45	. .	. .	. .	+ 44.0	63 0 49.4	1 52.1	− 24 9 2.7	+ 16.4	Y.	
46	. .	. .	. .	+ 2 3.2	70 37 0.9	2 41.5	− 31 46 3.6	+ 17.7	Y.	
47	. .	. .	. .	− 2 34.2	4 2 25.6	4.0	+ 34 51 9.2	+ 2.5	Y.	
48	. .	. .	. .	− 2 25.2	77 27 40.6	4 12.2	− 38 38 14.0	+ 18.6	Y.	
49	29.945	63.0	56.3	− 47.3	55 49 19.8	1 24.5	− 16 57 5.5	+ 17.2	Y.	
50	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
51	29.970	67.5	68.4	− 7.7	70 54 56.3	2 40.5	− 32 3 58.0	+ 15.9	Y.	
52	. .	. .	. .	− 1 34.0	34 28 27.0	38.5	+ 4 24 33.3	+ 5.9	Y.	
53	29.970	68.0	67.3	+ 16.0	67 45 20.5	2 16.5	− 28 53 58.2	+ 16.0	Y.	
54	. .	. .	. .	− 2 35.0	1 7 31.6	1.1	+ 37 46 6.1	− 3.8	Y.	
55	. .	. .	. .	− 3 0.7	1 7 5.8	1.1	+ 37 46 31.9	− 3.8	Y.	
56	. .	. .	. .	− 2 5.7	35 7 58.3	39.6	+ 3 45 0.9	+ 7.5	Y.	
57	29.970	68.0	66.0	+ 48.9	63 45 53.0	1 53.8	− 24 54 8.0	+ 15.7	Y.	Followed by another star southward.
58	. .	. .	. .	− 1 22.1	33 18 41.5	37.0	+ 5 34 20.3	+ 7.9	Y.	
59	. .	. .	. .	+ 2 1.7	64 32 8.0	1 57.9	− 25 40 27.1	+ 16.3	Y.	
60	29.970	67.5	65.0	+ 1 47.0	72 16 51.2	2 54.7	− 33 26 7.1	+ 18.0	Y.	
61	. .	. .	. .	+ 50.6	77 10 51.2	4 2.8	− 38 21 15.2	+ 18.8	Y.	
62	. .	. .	. .	− 24.8	3 59 39.2	4.0	+ 34 53 55.6	+ 2.3	Y.	
63	. .	. .	. .	+ 2 46.3	64 2 52.4	1 55.7	− 25 11 9.3	+ 16.7	Y.	
64	. .	. .	. .	+ 2 2.0	53 42 8.1	1 16.9	− 14 49 46.2	+ 15.0	Y.	
65	29.950	67.0	62.8	− 2 8.0	61 22 52.8	1 43.5	− 22 30 57.5	+ 16.4	Y.	
66	. .	. .	. .	− 9.6	S. 73 49 54.2	3 12.8	− 34 59 28.2	+ 18.0	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
1875.						° ′ ″	″	″	″	″	″	″	r.	r.	r.
May 11	1	Anon. 13h 29m 35s	9.5	1	V	51 40 7.6	3.2	7.1	10.0	7.4	12.6	7.98	28.568	—0.841	27.727
	2	B. A. C. 4586	. .	3	III–VII	94 30 2.7	59.8	4.8	5.9	3.2	8.0	4.07	34.621	—0.891	33.737
	3	Anon. 13h 49m 21s	. .	2	V, IX	96 35 1.8	0.2	3.1	5.1	2.2	6.7	3.18	35.932	. .	35.079
	4	Anon. 13h 49m 26s	7.0	3	IV–VI	" " "	"	"	"	"	"	"	26.889	. .	26.000
	5	Anon. 13h 57m 28s	8.0	3	III–VII	96 30 0.2	59.6	2.2	3.3	0.4	5.5	1.87	29.342	. .	28.458
	6	B. A. C. 4719	6.0	3	III–VII	87 35 2.8	59.3	3.7	5.4	3.2	7.5	3.65	33.926	. .	33.040
	7	Nadir	. .	.	. .	200 0 2.4	59.7	4.1	5.4	1.8	9.4	3.80	30.864	. .	. .
12	8	B. A. C. 3677	. .	3	III–VII	90 55 1.5	58.2	1.3	3.0	0.4	5.7	1.68	30.869	—0.665	30.210
	9	B. A. C. 3737	. .	3	III–VII	52 25 1.5	55.2	0.7	2.1	59.6	6.4	0.92	35.754	. .	35.088
	10	Weisse (2) XI, 1185	7.5	3	III–VII	21 30 5.8	2.8	6.3	7.4	7.5	11.3	6.85	33.198	. .	32.526
	11	O. Arg. S. 11250.	7.5	3	III–VII	84 15 2.1	59.4	4.7	4.9	1.8	7.8	3.45	29.677	. .	29.017
	12	B. A. C. 3917	7.0	3	III–VII	55 10 4.8	0.8	5.8	8.0	5.4	10.2	5.83	34.722	. .	34.056
	13	O. Arg. N. 11901	9.0	1	V	347 40 0.0	55.9	3.0	0.8	59.1	5.7	0.75	32.134	. .	31.469
	14	B. A. C. 3974	. .	3	V–IX	95 20 3.3	2.2	7.1	7.2	4.7	9.7	5.70	30.586	. .	29.936
	15	B. A. C. 4016	6.0	3	III–VII	93 15 5.5	2.3	6.8	8.9	4.2	10.8	6.42	34.576	. .	33.918
	16	B.A.C. 8255 (1st*), S.P.	. .	1	V	304 20 4.6	59.2	8.0	7.8	5.2	10.2	5.83	28.398	. .	27.733
	17	B.A.C. 8255 (2d *), S.P.	. .	2	IV, VI	" " "	"	"	"	"	"	"	28.205	. .	27.550
	18	Lacaille 5063.	. .	3	III–VII	92 15 2.8	0.0	5.8	5.9	1.8	6.7	3.83	27.261	. .	26.602
	19	Radcliffe 2857	8.5	1	V	354 25 2.8	59.2	7.1	5.3	4.2	8.2	4.47	30.980	. .	30.315
	20	Radcliffe 2860	7.2	1	V	" " "	"	"	"	"	"	"	32.078	. .	31.413
	21	Lalande 23654	8.5	3	III–VII	24 0 5.7	4.2	9.6	9.0	6.9	11.2	7.76	31.542	. .	30.870
	22	35 Virginis	6.0	3	III–VII	54 40 2.3	59.8	3.2	6.8	2.2	7.7	3.67	34.894	. .	34.228
	23	κ Virginis	5.0	3	III–VII	62 0 2.2	58.8	1.7	4.5	1.2	7.7	2.68	28.372	. .	27.708
	24	ψ Hydræ	5.0	3	III–VII	81 20 2.2	0.8	4.5	5.8	0.6	6.2	3.35	32.471	. .	31.810
	25	γ Hydræ	. .	3	III–VII	81 25 3.7	0.8	5.1	7.0	2.3	8.0	4.48	34.942	. .	34.281
	26	Nadir	. .	.	. .	199 59 56.2	53.3	58.1	60.1	54.8	62.9	57.57	30.437	. .	. .
14	27	κ Leonis	. .	3	III–VII	43 59 59.1	53.1	58.7	59.2	56.4	63.3	58.30	26.761	—0.659	26.099
	28	Nadir	. .	.	. .	200 0 0.8	56.8	1.9	3.1	58.3	6.9	1.30	30.550	. .	. .
	29	Lacaille 4633.	. .	3	III–VII	90 45 2.7	59.2	3.9	4.9	0.7	6.7	3.02	31.884	. .	31.231
	30	O. Arg. S. 11318	6.5	3	III–VII	86 30 4.0	0.0	5.7	7.2	4.2	9.0	5.02	29.544	. .	28.890
	31	Weisse (2) XI, 608	8.2	3	III–VII	41 5 5.6	2.9	7.4	6.7	6.7	12.6	6.98	29.581	. .	28.919
	32	Lacaille 4886	. .	3	III–VII	94 5 4.9	1.6	6.2	7.8	5.4	8.3	5.70	33.935	. .	33.283
	33	B. A. C. 4016	6.0	3	V–IX	93 14 57.7	55.2	59.1	60.4	56.7	62.2	58.55	34.306	—0.672	33.647
	34	B.A.C. 8355 (1st*), S.P.	. .	3	IV–VI	304 20 3.8	54.4	5.2	3.4	1.8	6.1	2.45	28.245	. .	27.579
	35	B. A. C. 4095	. .	3	III–VII	92 50 7.5	6.2	8.9	11.2	6.4	11.8	8.67	28.177	. .	27.511
	6	Lacaille 5191	. .	3	III–VII	90 40 2.4	58.8	3.5	2.7	59.8	4.9	2.02	27.180	. .	26.514
	37	B. A. C. 4262	5.5	3	III–VII	98 10 0.7	57.8	1.2	2.6	59.3	5.0	1.10	35.401	. .	34.737
	38	Lacaille 5301	. .	3	III–VII	89 15 4.0	2.3	6.0	7.2	3.4	8.7	5.27	29.568	. .	28.902
	39	κ Virginis	. .	3	III–VII	62 0 1.4	57.9	3.1	3.8	0.4	6.2	2.13	28.393	. .	27.722
	40	ψ Hydræ	. .	3	III–VII	81 20 3.8	1.7	6.1	7.7	2.7	7.4	4.90	32.458	. .	31.790
	41	γ Hydræ	. .	3	III–VII	81 25 1.1	58.9	3.1	3.6	59.4	5.6	1.95	34.796	—0.685	34.115
	42	ι Virginia	. .	3	III–VII	70 55 4.5	2.0	6.6	8.8	4.2	10.8	6.15	28.733	. .	28.050
	43	B. A. C. 4541, (1st *).	7.2	2	I, IX	84 45 4.3	2.2	9.8	10.5	5.9	10.1	7.13	33.751	. .	33.090
	44	B. A. C. 4541, (2d *).	6.5	3	III–VII	" " "	"	"	"	"	"	"	34.090	. .	33.410
	45	Weisse (2) XIII, 866	. .	3	III–VII	20 24 59.4	56.2	62.3	62.2	60.2	63.1	60.57	35.170	. .	34.477
	46	Lacaille 5758.	. .	3	III–VII	96 35 3.0	3.3	8.1	9.8	4.7	8.7	6.27	35.887	. .	35.209
	47	π Hydræ	5.0	3	III–VII	84 55 3.7	1.0	7.8	8.5	3.7	8.9	5.60	27.688	. .	27.008
	48	B. A. C. 4719	. .	3	III–VII	87 35 4.7	1.7	7.0	8.5	3.4	8.7	5.67	33.843	. .	33.163
	49	Nadir	. .	.	. .	199 59 59.3	57.8	62.0	65.7	58.6	66.8	61.70	30.588	. .	. .
17	50	p^3 Leonis	. .	3	IV–VI	56 15 2.5	57.2	3.7	6.9	2.2	6.3	3.13	30.767	—0.676	30.091
	51	ξ Ursæ Majoris	. .	3	III–VII	26 40 6.1	4.4	8.8	11.9	6.2	10.2	7.93	31.818	. .	31.136
	52	80 Leonis	6.0	3	III–VII	54 20 4.0	2.4	6.1	9.1	4.2	8.5	5.72	30.528	. .	29.851
	53	B. A. C. 3928	. .	3	III–VII	90 0 1.2	0.4	5.7	5.8	59.8	4.5	2.57	28.329	. .	27.659
	54	B. A. C. 8273, S. P.	. .	3	IV–VI	306 0 3.7	59.0	5.2	5.9	1.1	5.0	3.32	24.116	. .	23.447
	55	Anon. 11h 49m 18s	9.0	3	V–IX	47 50 1.6	57.1	3.4	5.8	1.1	6.0	2.50	30.309	. .	29.628
	56	B.A.C. 8355 (2d *), S.P.	. .	3	IV–VI	304 20 3.2	0.8	7.9	8.3	4.6	7.1	5.32	28.131	. .	27.461
	57	Lacaille 5065.	. .	3	III–VII	97 4 56.6	54.8	59.7	60.5	55.4	60.0	57.83	32.805	. .	32.137
	58	O. Arg. S. 12101	8.0	2	VII, IX	84 55 2.8	2.0	8.0	10.9	3.8	8.2	5.95	32.482	. .	31.819
	59	O. Arg. S. 12254.	9.0	3	III–VII	81 40 1.1	0.8	4.0	5.5	0.2	4.7	2.72	32.045	. .	31.373
	60	38 Virginis	6.0	3	III–VII	61 45 4.6	3.3	7.2	11.2	4.1	9.5	6.65	30.189	. .	29.514
	61	κ Virginis	. .	3	III–VII	62 0 2.3	1.8	5.2	7.8	1.6	8.1	4.47	28.561	. .	27.886
	62	Anon. 12h 57m 27s	8.5	3	III–VII	75 50 4.9	4.1	10.8	11.9	6.2	9.7	7.93	32.195	. .	31.522
	63	Anon. 13h 14m 22s	8.8	3	IV–VI	46 0 6.7	6.8	11.0	13.8	8.2	11.2	9.62	33.008	. .	32.331
	64	Anon. 13h 21m 29s	8.3	3	IV–VI	91 40 3.5	4.4	7.9	10.5	4.1	8.7	6.52	28.049	. .	27.375
	65	B. A. C. 4560	7.5	3	III–VII	71 0 1.9	2.1	5.0	9.0	2.0	7.4	4.57	27.760	—0.676	27.086

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	+ 1 11.2	S. 31 41 19.2	35.0	+ 7 11 54.6	+ 11.6	Y.	Very faint.
2	29.945	66.5	62.3	− 1 57.1	74 28 7.0	3 21.0	− 35 37 49.2	+ 17.7	Y.	
3	. .	. .	. .	− 2 39.2	76 32 24.0	3 52.3	− 37 42 37.5	+ 17.7	Y.	
4	. .	. .	. .	+ 2 5.3	76 37 8.5	3 53.6	− 37 47 23.3	+ 17.8	Y.	
5	. .	. .	. .	+ 48.3	76 30 50.2	3 51.8	− 37 41 3.2	+ 17.5	Y.	
6	29.930	66.2	62.1	− 1 35.3	67 33 28.4	2 16.4	− 28 42 6.0	+ 16.7	Y.	
7	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
8	29.972	68.5	66.4	− 6.6	70 54 55.1	2 41.1	− 32 3 57.4	+ 16.0	Y.	
9	. .	. .	. .	− 2 39.5	32 22 21.5	35.7	+ 6 30 41.6	+ 4.9	Y.	
10	. .	. .	. .	− 1 19.2	1 28 47.7	1.5	+ 37 24 49.6	− 4.7	Y.	
11	29.982	68.2	64.5	+ 30.8	64 15 34.3	1 56.7	− 25 23 52.2	+ 15.3	Y.	
12	. .	. .	. .	− 2 7.1	S. 35 7 58.7	39.8	+ 3 45 0.3	+ 7.4	Y.	
13	. .	. .	. .	− 46.0	N. 32 20 45.3	35.8	+ 71 14 59.9	− 11.1	Y.	Faint.
14	. .	. .	. .	+ 2.0	S. 75 20 7.7	3 32.8	− 36 30 1.7	+ 18.3	Y.	
15	. .	. .	63.4	+ 2 2.8	S. 73 13 3.6	3 5.5	− 34 22 30.3	+ 18.0	Y.	
16	. .	. .	. .	+ 1 11.1	N. 75 38 43.1	3 37.7	+ 65 24 0.4	+ 12.0	Y.	
17	30.000	67.0	63.2	+ 1 16.8	N. 75 38 37.4	3 37.7	+ 65 24 6.1	+ 12.0	Y.	Faint.
18	. .	. .	. .	+ 1 46.5	S. 72 16 50.3	2 55.6	− 33 26 7.1	+ 18.1	Y.	
19	. .	. .	. .	− 9.9	N. 25 35 5.4	27.2	+ 64 29 11.4	− 5.9	Y.	
20	. .	. .	. .	− 44.3	N. 25 35 39.8	27.2	+ 64 29 45.8	− 5.8	Y.	
21	. .	. .	. .	− 27.2	S. 3 59 40.5	4.0	+ 34 53 54.3	+ 2.1	Y.	
22	30.020	66.2	61.6	− 2 12.5	34 37 51.2	39.3	+ 4 15 8.3	+ 10.4	Y.	
23	. .	. .	. .	+ 1 11.8	42 1 14.5	51.3	− 3 8 27.0	+ 12.5	Y.	
24	. .	. .	. .	− 56.7	61 19 6.6	1 43.8	− 22 27 11.6	+ 16.4	Y.	
25	30.030	66.0	60.7	− 2 14.2	61 22 50.3	1 44.2	− 22 30 55.7	+ 16.5	Y.	
26	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
27	30.074	68.3	67.0	+ 2 2.2	24 2 0.6	25.2	+ 14 51 13.0	+ 1.6	Y.	
28	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
29	30.074	68.4	65.7	− 38.6	70 44 24.5	2 40.3	− 31 53 26.0	+ 16.9	Y.	
30	. .	. .	. .	+ 34.8	66 30 39.8	2 9.5	− 27 39 10.5	+ 16.1	Y.	
31	. .	. .	. .	+ 33.9	21 5 40.9	21.9	+ 17 47 36.0	+ 3.2	Y.	
32	30.064	67.8	63.7	− 1 42.9	74 3 22.8	3 15.9	− 35 12 59.9	+ 18.3	Y.	
33	. .	. .	. .	− 1 54.3	S. 73 13 4.2	3 5.9	− 34 22 31.3	+ 18.2	Y.	
34	. .	. .	. .	+ 1 15.9	N. 75 38 41.6	3 38.0	+ 65 24 1.6	+ 12.1	Y.	
35	30.060	67.3	63.5	+ 1 18.0	S. 72 51 26.7	3 1.9	− 34 0 49.8	+ 18.4	Y.	
36	. .	. .	. .	+ 1 49.3	70 41 51.3	2 40.7	− 31 50 53.2	+ 16.6	Y.	
37	30.064	67.0	62.8	− 2 28.4	78 7 32.7	4 23.6	− 39 18 17.5	+ 19.4	Y.	
38	. .	. .	. .	+ 34.4	69 15 39.7	2 29.1	− 30 24 30.0	+ 17.9	Y.	
39	. .	. .	. .	+ 1 11.4	42 1 13.5	51.3	− 3 8 26.0	+ 12.5	Y.	
40	. .	. .	. .	− 56.1	61 19 8.8	1 43.8	− 22 27 13.8	+ 16.6	Y.	
41	30.050	66.2	61.5	− 2 9.0	61 22 53.0	1 44.1	− 22 30 58.3	+ 16.6	Y.	
42	. .	. .	. .	+ 1 1.1	50 56 7.2	1 10.2	− 12 3 38.6	+ 14.9	Y.	
43	. .	. .	. .	− 1 36.9	64 43 30.3	2 0.2	− 25 51 51.7	+ 17.1	Y.	
44	. .	. .	. .	− 1 46.9	64 43 20.3	2 0.2	− 25 51 41.7	+ 17.1	Y.	
45	. .	. .	. .	− 2 20.3	0 22 40.3	0.4	+ 38 30 58.1	+ 5.7	Y.	
46	30.040	65.5	60.2	− 2 43.2	76 32 23.0	3 54.0	− 37 42 38.2	+ 18.1	Y.	
47	. .	. .	. .	+ 1 33.7	64 56 39.4	2 1.7	− 26 5 2.3	+ 16.9	Y.	
48	30.040	65.2	59.5	− 1 39.1	67 33 26.5	2 17.6	− 28 42 5.3	+ 17.0	Y.	
49	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
50	30.186	65.0	59.5	− 2.9	36 15 0.3	42.1	+ 2 37 56.4	+ 6.6	Y.	
51	. .	. .	. .	− 35.6	6 39 32.3	6.7	+ 32 13 59.8	− 2.8	Y.	As one star.
52	. .	. .	. .	+ 4.7	34 20 10.4	39.3	+ 4 32 49.1	+ 6.8	Y.	
53	30.186	64.2	58.1	+ 1 13.4	S. 70 1 15.9	2 37.2	− 31 10 14.3	+ 17.5	Y.	
54	. .	. .	57.2	+ 3 25.3	N. 73 56 31.3	3 17.6	+ 67 6 32.3	+ 13.5	Y.	
55	. .	. .	. .	+ 11.7	S. 27 50 14.2	30.5	+ 11 2 54.1	+ 6.0	Y.	
56	30.180	63.2	56.3	+ 1 19.6	N. 75 38 35.1	3 42.1	+ 65 24 4.0	+ 12.3	Y.	
57	. .	. .	. .	− 1 7.0	S. 77 3 50.9	4 6.8	− 38 14 18.9	+ 19.6	Y.	
58	. .	. .	. .	− 57.0	64 54 8.9	2 3.1	− 26 2 33.2	+ 17.2	Y.	
59	30.180	62.0	54.7	− 43.0	61 39 19.7	1 47.2	− 22 47 28.1	+ 16.7	Y.	
60	. .	. .	. .	+ 15.2	41 45 21.9	51.8	− 2 52 34.9	+ 12.2	Y.	
61	. .	. .	. .	+ 1 6.2	42 1 10.7	52.3	− 3 8 24.2	+ 12.5	Y.	
62	. .	. .	. .	− 47.7	55 49 20.2	1 25.4	− 16 57 6.8	+ 15.7	Y.	
63	. .	. .	. .	− 1 13.1	25 58 56.6	28.3	+ 12 54 13.9	+ 9.3	Y.	
64	30.180	60.7	53.5	+ 1 22.3	71 41 28.8	2 54.0	− 32 50 44.0	+ 18.6	Y.	
65	. .	. .	. .	+ 1 31.3	S. 51 1 35.9	1 11.8	− 12 9 8.9	+ 15.2	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. May 17	1	Anon. $13^h 43^m 30^s$.	. .	3	III–VII	96 19 56.9	56.4	59.8	61.2	55.1	59.4	58.13	28.992	−0.676	28.323
	2	Weisse (2) XIII, 1159	8.5	3	III–VII	35 25 6.8	6.8	9.8	13.8	6.1	10.1	8.90	31.299	. .	30.619
	3	π Hydræ	. .	2	VII, IX	84 55 0.8	0.8	7.0	9.5	1.2	6.2	4.25	27.764	. .	27.101
	4	ι Virginis	5.0	3	III–VII	64 15 3.9	3.4	8.8	12.3	3.9	7.5	6.63	26.888	. .	26.213
	5	Weisse XIV, 314 .	9.0	3	III–VII	55 45 2.4	2.5	6.2	12.4	1.8	7.5	5.47	27.372	. .	26.695
	6	Anon. $14^h 29^m 12^s$.	8.3	3	III–VII	21 10 4.9	5.2	9.1	14.1	6.2	8.6	8.02	26.154	. .	25.471
	7	Nadir	. .	.	. .	199 59 57.4	57.2	62.7	65.3	56.2	63.0	60.30	30.534	. .	. .
19	8	B. A. C. 4993 . .	. .	3	V–IX	97 9 58.3	59.0	61.2	63.0	58.3	63.7	60.58	33.388	−0.717	32.687
	9	12 Virginis	5.0	3	III–VII	47 55 1.1	56.2	1.8	4.3	1.8	5.1	1.72	29.273	. .	28.554
	10	Lacaille 5144. . .	. .	3	III–VII	85 55 3.0	1.8	5.9	8.6	3.7	6.5	4.92	30.502	. .	29.790
	11	q Virginis	. .	3	V–IX	67 40 0.5	57.8	2.8	3.9	0.7	5.1	1.80	33.561	. .	32.848
	12	Lacaille 5278 . .	. .	3	III–VII	91 30 1.2	59.0	3.1	4.8	0.8	4.8	2.28	32.762	. .	32.051
	13	ψ Virginis	. .	3	III–VII	67 45 2.1	0.4	4.4	6.4	2.2	7.4	3.82	31.990	. .	31.275
	14	Lacaille 5367 . .	. .	3	III–VII	86 30 2.4	0.8	6.3	8.3	2.6	7.3	4.62	33.615	. .	32.903
	15	Lalande 24579 . .	6.5	3	III–VII	21 20 6.4	4.0	9.7	10.2	8.4	10.7	8.23	29.810	. .	29.086
	16	62 Virginis	. .	3	III–VII	69 30 2.8	2.7	7.5	8.8	4.7	8.0	5.75	27.909	. .	27.194
	17	Lacaille 5553. . .	. .	3	III–VII	84 35 0.0	59.4	4.1	5.4	0.8	4.8	2.42	26.763	. .	26.051
	18	B. A. C. 4593 . .	7.0	3	V–IX	65 0 4.5	0.8	8.0	9.7	3.7	8.0	5.78	35.324	. .	34.608
	19	Lacaille 5763 . .	. .	3	III–VII	85 55 3.4	3.3	8.9	10.8	5.1	8.5	6.67	34.194	. .	33.482
	20	Weisse (2) XIV, 1314	8.0	3	III–VII	23 55 3.4	0.9	7.2	7.1	2.9	7.0	4.75	31.432	. .	30.708
	21	ι Virginis	. .	3	III–VII	64 15 4.7	2.3	7.8	9.6	4.0	7.2	5.93	26.857	. .	26.141
	22	λ Virginis	. .	3	IV–VI	71 40 2.8	59.7	4.8	6.2	1.2	6.4	3.52	30.101	. .	29.385
	23	B. A. C. 4776 . .	7.0	3	V–IX	85 10 4.7	3.7	9.7	12.3	5.8	9.2	7.57	33.089	. .	32.381
	24	Lacaille 6038 . .	. .	3	III–VII	94 25 3.2	3.3	7.2	10.0	3.8	7.4	5.82	28.343	. .	27.633
	25	57 Hydræ	. .	3	V–IX	85 0 0.3	59.7	5.9	7.3	1.1	5.3	3.27	32.484	. .	31.776
	26	B. A. C. 4937 . .	. .	3	III–VII	8 45 0.8	0.1	5.0	7.1	1.6	4.0	3.10	29.805	. .	29.077
	27	Lacaille 6219 . .	. .	3	III–VII	88 55 1.1	1.1	5.9	8.0	2.8	5.1	4.00	30.126	. .	29.415
	28	ι^2 Libræ	. .	3	III–VII	78 5 4.9	6.0	10.5	12.2	7.2	8.9	8.28	35.044	. .	34.330
	29	Nadir	. .	.	. .	199 59 56.0	53.1	60.2	63.2	54.2	61.9	58.10	30.505	. .	. .
22	30	g Ursæ Majoris . .	. .	3	IV–VI	3 15 3.9	58.8	7.8	4.8	7.1	9.2	5.27	29.835	−0.677	29.154
	31	Lacaille 5635. . .	. .	3	III–VII	85 50 2.7	57.2	4.9	2.9	3.9	6.9	3.08	33.755	. .	33.083
	32	g Centauri	. .	3	III–VII	92 39 60.7	55.3	61.1	60.0	58.6	64.2	59.98	29.602	. .	28.931
	33	B. A. C. 4671 . .	. .	3	III–VII	85 40 2.6	56.8	6.0	3.0	3.0	6.9	3.05	28.099	. .	27.427
	34	B. A. C. 4719 . .	. .	3	III–VII	87 35 1.7	55.1	1.3	59.7	59.8	4.5	0.35	33.538	. .	32.866
	35	B. A. C. 4773 . .	. .	3	III–VII	52 30 3.6	55.8	5.2	2.2	2.9	8.6	3.05	30.875	. .	30.197
	36	σ Bootis.	. .	3	V–IX	28 35 4.0	58.9	7.2	5.7	6.2	11.0	5.50	28.355	. .	27.665
	37	B. A. C. 4852 . .	. .	3	V–IX	93 30 0.3	55.8	1.6	59.7	59.3	5.0	0.28	32.794	. .	32.130
	38	δ Libræ	. .	3	III–VII	66 55 6.0	1.8	10.1	6.9	6.9	12.7	7.40	32.468	. .	31.792
	39	B. A. C. 4984 . .	. .	3	III–VII	82 25 4.8	58.2	5.3	3.2	2.7	7.8	3.67	35.506	. .	34.833
	40	ι Lupi	5.0	3	III–VII	88 35 2.9	57.7	3.6	0.9	0.8	6.8	2.12	34.934	. .	34.262
	41	Nadir.	. .	.	. .	200 0 2.0	57.4	5.2	4.0	1.1	8.2	2.98	30.622	. .	. .
25	42	ι Leonis	. .	3	III–VII	47 39 60.0	50.3	59.7	56.7	57.8	63.4	57.98	30.252	−0.582	29.668
	43	B. A. C. 8273, S. P. .	. .	3	IV–VI	306 5 4.3	53.2	4.1	0.4	1.3	6.2	1.58	33.835	. .	33.260
	44	Nadir	. .	.	. .	200 0 6.4	58.8	6.3	4.8	3.9	10.9	5.18	30.597	. .	. .
	45	O. Arg. S. 11982 .	. .	3	III–VII	84 5 1.8	54.8	2.9	0.9	0.6	5.9	1.15	27.285	. .	26.708
	46	12 Comæ	6.0	3	III–VII	32 20 5.0	59.1	6.2	4.3	5.3	9.9	4.97	28.782	. .	28.195
	47	Anon. $12^h 17^m 48^s$.	7.5	3	III–VII	" " "	"	"	"	"	"	"	29.316	. .	28.729
	48	Anon. $12^h 36^m 14^s$.	. .	1	V	63 40 3.4	55.9	2.7	1.9	1.6	5.9	1.90	33.402	. .	32.820
	49	Lalande 23919 . .	8.0	3	III–VII	22 55 5.2	0.2	7.5	4.7	5.4	10.3	5.55	33.936	. .	33.347
	50	Anon. $12^h 53^m 39^s$.	7.8	1	V	349 30 2.1	54.8	6.2	4.0	1.2	6.1	2.40	28.350	. .	27.768
	51	Anon. $12^h 54^m 27^s$.	8.0	1	V	" " "	"	"	"	"	"	"	36.382	. .	35.800
	52	B. A. C. 4405 . .	. .	3	III VII	100 25 5.4	59.0	6.0	4.9	1.8	8.4	4.25	35.194	. .	34.621
	53	Anon. $13^h 15^m 31^s$.	9.0	3	III–VII	20 25 9.9	5.6	13.2	11.3	11.6	14.2	10.97	30.076	. .	29.486
	54	Anon. $13^h 25^m 22^s$.	8.8	3	IV–VI	357 0 6.8	2.4	12.7	9.5	8.4	oblit.	9.21	30.766	. .	30.178
	55	Weisse XIII, 566 .	. .	2	IV, V	66 55 6.7	1.2	11.0	7.9	5.7	12.2	7.45	33.984	. .	33.404
	56	Weisse XIII, 569 .	8.2	2	VII, IX	" " "	"	"	"	"	"	"	30.950	. .	30.368
	57	Lalande 25494 . .	7.3	2	VII, IX	36 59 59.7	53.2	61.5	60.0	59.0	64.7	59.68	28.920	. .	28.321
	58	Piazzi 220 . . .	7.0	2	III, V	" " "	"	"	"	"	"	"	31.302	. .	30.718
	59	Brisbane 4727 . .	7.5	2	VII, IX	95 45 4.9	1.0	8.8	6.7	5.3	9.9	6.10	36.410	. .	35.848
	60	Nadir	. .	.	. .	200 0 4.1	59.7	6.8	6.7	3.2	10.2	5.12	30.592	. .	. .
29	61	B. A. C. 4852 . .	5.0	3	IV–VI	93 30 3.9	59.7	5.2	5.7	2.5	8.1	4.18	32.993	−0.684	32.311
	62	B. A. C. 4858 . .	6.0	3	V–IX	" " "	"	"	"	"	"	"	29.899	. .	29.233
	63	δ Libræ	. .	3	III–VII	66 55 2.0	57.9	5.9	4.1	1.8	8.8	3.42	32.348	. .	31.665
	64	O. Arg. S. 14257 .	. .	3	III–VII	87 55 5.5	1.7	6.7	7.6	3.7	9.1	5.72	35.092	. .	34.413
	65	Nadir	. .	.	. .	200 0 3.6	59.2	7.0	6.0	1.5	8.4	4.28	30 670	−0.684	. .

Number.	Barometer.	THERM'S. At.	THERM'S. Ex.	Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	+ 52.6	S. 76 20 50.7	3 55.3	− 37 31 7.2	+ 18.8	Y.	
2	. .	. .	. .	− 19.4	15 24 49.5	16.1	+ 23 28 33.2	+ 8.9	Y.	
3	30.176	60.0	51.3	+ 1 30.8	64 56 35.1	2 4.3	− 26 5 0.6	+ 17.2	Y.	
4	. .	. .	. .	+ 1 58.7	44 17 5.3	57.0	− 5 24 23.5	+ 14.4	Y.	
5	. .	. .	. .	+ 1 43.6	35 46 49.1	42.2	+ 3 6 7.5	+ 13.3	Y.	
6	30.176	59.2	50.2	+ 2 21.9	1 12 30.0	1.2	+ 37 41 7.6	+ 8.5	Y.	
7	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
8	30.086	64.5	59.6	− 1 24.2	77 8 36.4	4 5.6	− 38 19 3.2	+ 19.7	Y.	
9	. .	. .	. .	+ 45.3	27 55 47.0	30.4	+ 10 57 21.4	+ 6.7	Y.	
10	30.080	64.0	58.8	+ 6.6	65 55 11.5	2 7.7	− 27 3 40.4	+ 17.6	Y.	
11	. .	. .	. .	− 1 29.2	47 38 32.5	1 3.0	− 8 45 56.7	+ 13.2	Y.	
12	30.084	63.8	57.5	− 1 4.3	71 28 58.0	2 50.0	− 32 38 9.2	+ 18.9	Y.	
13	. .	. .	. .	− 40.0	47 44 23.8	1 3.3	− 8 51 48.3	+ 13.7	Y.	
14	. .	. .	. .	− 1 31.0	66 28 33.6	2 11.5	− 27 37 6.3	+ 18.0	Y.	
15	. .	. .	. .	+ 28.6	1 20 36.9	1.4	+ 37 33 0.5	+ 2.7	Y.	
16	30.076	63.0	56.5	+ 1 28.0	49 31 33.7	1 7.4	− 10 39 2.3	+ 16.6	Y.	
17	. .	. .	. .	+ 2 3.8	64 37 6.2	2 0.9	− 25 45 28.3	+ 17.7	Y.	
18	. .	. .	. .	− 2 24.4	44 57 41.4	57.6	− 6 5 0.2	+ 14.1	Y.	
19	30.067	62.0	55.4	− 1 49.1	65 53 17.5	2 8.3	− 27 1 47.0	+ 17.7	Y.	
20	. .	. .	. .	− 22.2	3 54 42.6	3.9	+ 34 58 52.3	+ 6.8	Y.	
21	. .	. .	. .	+ 2 0.9	44 17 6.9	56.3	− 5 24 24.4	+ 14.4	Y.	
22	. .	. .	. .	+ 19.3	51 40 22.8	1 12.9	− 12 47 56.9	+ 15.5	Y.	
23	. .	. .	. .	− 1 14.7	65 8 52.9	2 4.0	− 26 17 18.1	+ 17.2	Y.	
24	30.074	61.0	55.4	+ 1 14.2	74 26 20.0	3 24.4	− 35 36 5.6	+ 17.6	Y.	
25	. .	. .	. .	− 55.7	S. 64 59 7.6	2 3.1	− 26 7 31.9	+ 16.7	Y.	
26	. .	. .	. .	+ 28.9	N. 11 14 28.0	11.5	+ 50 8 18.3	+ 8.0	Y.	
27	. .	. .	. .	+ 18.3	S. 68 55 22.3	2 28.7	− 30 4 12.2	+ 16.5	Y.	
28	30.068	61.0	55.2	− 2 15.7	S. 58 2 52.6	1 32.4	− 19 10 46.2	+ 15.7	Y.	
29	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
30	29.940	74.0	71.6	+ 26.5	N. 16 44 28.2	16.7	+ 55 38 23.7	− 0.9	Y.	
31	. .	. .	. .	− 1 36.6	S. 65 48 26.5	2 3.3	− 26 56 51.0	+ 17.9	Y.	
32	29.935	73.8	70.7	+ 33.5	72 40 33.5	2 56.6	− 33 49 51.3	+ 18.9	Y.	
33	. .	. .	. .	+ 1 20.7	65 41 23.7	2 2.7	− 26 49 47.6	+ 17.7	Y.	
34	29.930	73.3	70.2	− 1 29.8	67 33 30.5	2 14.2	− 28 42 5.9	+ 17.8	Y.	
35	. .	. .	. .	− 6.2	32 29 56.9	35.6	+ 6 23 6.3	+ 12.3	Y.	
36	. .	. .	. .	+ 1 13.2	8 36 18.7	8.5	+ 30 17 11.6	+ 8.6	Y.	
37	29.935	73.0	68.8	− 1 6.7	73 28 53.5	3 6.2	− 34 38 20.9	+ 17.8	Y.	
38	. .	. .	. .	− 56.2	46 54 11.2	59.8	− 8 1 32.2	+ 14.8	Y.	
39	. .	. .	. .	− 2 31.5	62 22 32.2	1 46.7	− 23 30 40.1	+ 16.1	Y.	
40	29.940	72.0	67.6	− 2 13.6	68 34 48.5	2 21.7	− 29 41 31.4	+ 16.3	Y.	
41	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
42	29.740	77.0	75.5	+ 10.4	S. 27 40 8.4	28.8	+ 11 13 1.6	+ 3.8	Y.	
43	29.740	77.0	75.0	− 1 42.2	N. 73 56 40.6	3 8.2	+ 67 6 32.4	+ 13.8	Y.	
44	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
45	29.745	76.5	73.7	+ 1 43.2	S. 64 6 44.3	1 52.9	− 25 14 58.4	+ 17.0	Y.	
46	. .	. .	. .	+ 56.6	12 21 1.5	12.1	+ 26 32 25.2	+ 1.6	Y.	
47	. .	. .	. .	+ 39.8	12 20 44.8	12.1	+ 26 32 41.9	+ 1.7	Y.	
48	. .	. .	. .	− 1 28.4	43 38 33.5	52.6	− 4 45 47.3	+ 12.0	Y.	
49	. .	. .	. .	− 1 44.9	S. 2 53 20.6	2.8	+ 36 0 15.4	+ 0.4	Y.	
50	. .	. .	. .	+ 1 10.0	N. 30 28 47.6	32.5	+ 69 22 58.9	− 6.2	Y.	
51	29.750	76.0	72.3	− 3 1.8	N. 30 32 59.4	32.6	+ 69 27 10.8	− 6.0	Y.	
52	. .	. .	. .	− 2 24.8	S. 80 22 39.4	5 13.3	− 41 34 13.9	+ 20.9	Y.	
53	. .	. .	. .	+ 16.1	S. 0 25 27.1	0.4	+ 38 28 11.3	+ 1.8	Y.	
54	. .	. .	. .	− 5.6	N. 22 59 56.3	23.5	+ 61 53 58.6	− 2.4	Y.	$+0^s.96$ applied to mean of B, C, D, and E.
55	. .	. .	. .	+ 1 46.7	46 53 20.8	59.1	− 8 0 41.1	+ 14.1	Y.	
56	29.755	75.0	71.2	− 11.5	S. 46 54 55.9	59.1	− 8 2 16.2	+ 14.1	Y.	
57	. .	. .	. .	+ 52.7	17 0 52.3	17.0	+ 21 52 29.5	+ 7.4	Y.	
58	. .	. .	. .	− 22.5	16 59 37.2	16.9	+ 21 53 44.7	+ 7.4	Y.	
59	29.750	74.5	70.3	− 3 3.3	75 42 2.8	3 33.6	− 36 51 57.6	+ 19.4	Y.	
60	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
61	. .	. .	. .	− 1 12.4	73 28 51.7	3 6.6	− 34 38 19.5	+ 18.5	Y.	
62	29.968	72.0	68.2	+ 24.0	73 30 28.2	3 6.9	− 34 39 56.3	+ 18.4	Y.	
63	. .	. .	. .	− 52.2	46 54 11.2	1 0.0	− 8 1 32.4	+ 14.5	Y.	
64	29.975	71.8	67.2	− 2 18.3	S. 67 52 47.4	2 17.3	− 29 1 25.9	+ 17.1	Y.	
65	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.									MICROMETER.		
						A.			B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						°	′	″	″	″	″	″	″	″	r.	r.	r.
1875. May 31	1	12 Virginis	. .	3	III–VII	47	55	4.3	55.9	4.8	3.7	3.8	8.0	3.42	29.412	−0.712	28.698
	2	12 Comæ	. .	3	III–VII	32	20	3.2	56.8	4.0	1.9	2.7	6.8	2.57	28.833	. .	28.116
	3	B. A. C. 4214	5.5	3	III–VII	81	55	2.7	56.8	4.0	3.9	0.3	6.0	2.28	35.620	. .	34.912
	4	B. A. C. 4253	5.8	3	III–VII	85	20	4.1	59.1	7.8	6.9	3.1	8.2	4.87	33.255	. .	32.548
	5	Lacaille 5302	6.5	3	III–VII	89	20	3.1	57.2	3.9	1.3	0.2	5.1	1.80	25.504	. .	24.798
	6	37 Comæ	. .	3	III–VII	27	25	1.7	57.3	5.3	3.5	2.4	5.7	2.65	28.999	. .	28.281
	7	B. A. C. 4405	. .	3	III–VII	100	25	3.9	58.1	3.7	4.9	0.2	5.1	2.65	35.300	. .	34.597
	8	*i* Virginis	6.0	3	III–VII	70	55	6.2	1.3	8.9	7.9	5.7	10.8	6.80	28.845	. .	28.135
	9	Anon. 13^{h} 26^{m} 31^{s}	7.5	3	III–VII	60	40	6.3	1.8	8.9	7.8	5.4	11.6	6.97	31.266	. .	30.554
	10	86 Virginis	. .	3	III–VII	70	40	3.1	58.8	5.1	3.8	2.8	7.4	3.50	29.575	. .	28.865
	11	Anon. 13^{h} 46^{m} 26^{s}	8.5	3	III–VII	87	15	3.8	58.2	4.9	6.2	1.4	6.8	3.55	29.791	. .	29.084
	12	Anon. 13^{h} 53^{m} 56^{s}	8.0	3	III–VII	95	35	1.3	58.3	4.3	4.3	1.2	5.0	2.40	32.938	. .	32.233
	13	Lacaille 5842	7.5	3	III–VII	88	5	6.1	3.3	7.9	8.0	4.7	10.1	6.68	34.371	. .	33.664
	14	λ Virginis	5.5	3	III–VII	71	40	7.3	2.6	9.5	9.3	6.0	11.2	7.65	30.250	. .	29.540
	15	O. Arg. S. 13683	8.5	3	III–VII	82	55	0.9	57.0	2.7	1.1	59.2	3.8	0.78	32.604	. .	31.896
	16	ζ Bootis	5.0	3	III–VII	44	40	5.1	1.3	7.8	5.5	3.7	8.5	5.32	35.842	. .	35.128
	17	Lacaille 6109	7.2	3	III–VII	90	45	4.8	0.6	7.7	6.9	2.3	7.1	4.90	29.983	. .	29.277
	18	B. A. C. 4937	. .	3	III–VII	8	45	7.7	5.1	13.1	12.1	8.7	10.9	9.60	30.165	. .	29.442
	19	B. A. C. 4984	. .	3	III–VII	82	25	3.0	59.4	5.5	4.9	0.1	6.0	3.15	35.623	. .	34.915
	20	O. Arg. S. 14428	7.7	3	III–VII	79	10	4.2	2.7	8.9	7.9	4.3	8.4	6.07	34.852	. .	34.144
	21	τ^1 Serpentis	. .	3	III–VII	43	0	4.9	1.9	8.0	8.0	4.5	9.0	6.05	28.490	. .	27.775
	22	Nadir	. .	.	. .	200	0	3.2	0.0	7.1	6.6	1.2	8.1	4.37	30.702	. .	. .
June 1	23	B. A. C. 4631	. .	3	III–VII	93	55	4.9	0.8	7.0	6.8	2.8	8.7	5.17	33.825	−0.836	32.996
	24	Nadir	. .	.	. .	200	0	4.6	0.2	7.6	6.9	2.2	9.9	5.23	30.855	. .	. .
4	25	28 Virginis	6.0	3	III–VII	65	40	4.8	57.9	6.8	4.7	4.9	9.1	4.70	27.719	−0.756	26.964
	26	38 Virginis	6.0	3	III–VII	61	45	1.8	55.8	3.7	1.8	1.6	6.5	1.87	30.040	. .	29.285
	27	κ Virginis	6.0	3	III–VII	62	0	3.7	58.4	5.3	4.0	3.3	9.0	3.95	28.517	. .	27.762
	28	B. A. C. 4378	5.5	3	IV–VI	99	45	7.0	2.8	9.2	7.9	5.8	10.4	7.18	32.662	. .	31.909
	29	B. A. C. 4437	. .	3	III–VII	89	40	2.1	58.2	4.0	2.7	1.3	6.1	2.40	26.773	. .	26.023
	30	*i* Virginis	6.0	3	III–VII	70	55	1.2	54.3	2.2	0.9	0.2	4.9	0.62	28.595	. .	27.841
	31	Anon. 13^{h} 26^{m} 34^{s}	8.0	3	III–VII	60	40	5.1	58.7	5.9	5.2	3.3	9.2	4.57	31.120	. .	30.364
	32	Weisse (2) XIII, 899	8.5	3	III–VII	40	25	2.2	56.5	4.9	2.1	1.7	7.8	2.53	34.085	. .	33.325
	33	Anon. 13^{h} 56^{m} 36^{s}	8.0	3	III–VII	96	0	3.5	59.9	7.1	5.9	4.2	8.5	4.85	29.949	. .	29.200
	34	Lacaille 5842	. .	3	III–VII	88	5	4.0	0.1	5.0	4.5	2.8	8.2	4.10	34.231	. .	33.480
	35	Lacaille 5898	7.2	3	III–VII	93	0	4.2	58.9	5.7	5.2	1.7	7.4	3.85	36.422	. .	35.672
	36	O. Arg. S. 13683	8.0	3	III–VII	82	55	5.0	59.7	6.7	5.7	3.2	7.7	4.67	32.769	. .	32.017
	37	ζ Bootis	4.5	3	III–VII	44	40	1.1	54.8	3.0	58.9	59.7	5.5	0.50	35.682	. .	34.924
	38	Weisse (2) XIV, 932	8.5	3	III–VII	22	20	2.3	57.9	5.3	2.8	3.2	7.1	3.10	31.908	. .	31.145
	39	Weisse (2) XIV, 936	8.0	2	VII, IX	“	“	“	“	“	“	“	“	“	34.265	. .	33.482
	40	B. A. C. 4937	5.0	3	IV–VI	8	45	8.0	4.2	10.8	9.0	9.2	11.2	8.73	30.178	. .	29.418
	41	O. Arg. S. 14257	7.5	3	V–IX	87	55	4.0	58.4	4.8	4.9	1.5	7.1	3.45	35.166	. .	34.419
	42	Anon. 15^{h} 13^{m} 12^{s}	8.5	3	III–VII	96	0	4.1	0.9	8.9	6.8	4.7	9.3	5.78	32.302	. .	31.553
	43	ι Draconis	5.0	3	IV–VI	359	30	0.3	55.4	5.9	2.2	0.4	4.3	1.42	31.126	. .	30.365
	44	B. A. C. 5167	7.0	3	III–VII	87	45	3.6	59.2	5.8	4.2	1.7	7.1	3.60	30.285	. .	29.534
	45	B. A. C. 5215	7.0	3	III–VII	87	15	3.7	57.8	5.4	5.7	1.3	7.0	3.48	29.489	. .	28.733
	46	ξ Lupi (1st *)	. .	2	I, IX	92	25	5.9	2.8	8.4	8.5	4.8	9.4	6.63	27.351	. .	26.627
	47	ξ Lupi (2d *)	. .	3	III–VII	“	“	“	“	“	“	“	“	“	27.597	. .	26.847
	48	Nadir	. .	.	. . .	200	0	4.7	1.4	7.5	7.2	2.5	10.4	5.62	30.788	. .	. .
10	49	g Virginis	5.5	3	III–VII	68	55	4.2	57.9	7.4	6.4	4.8	8.8	4.92	26.847	−0.746	26.103
	50	Nadir	. .	.	. .	200	0	2.8	54.9	4.8	1.9	0.5	7.5	2.07	30.665	. .	. .
	51	*h* Virginis	6.0	3	III–VII	68	25	0.3	54.3	3.6	1.3	0.8	6.1	1.07	32.598	. .	31.854
	52	Weisse (2) XIII, 814	8.5	3	V–IX	36	30	3.9	58.8	6.0	3.8	5.2	8.0	4.28	33.605	. .	32.847
	53	Anon. 13^{h} 52^{m} 2^{s}	8.5	3	III–VII	95	35	5.9	2.2	8.6	6.2	5.9	9.4	6.37	34.116	. .	33.377
	54	Lacaille 5842	7.2	3	III–VII	88	5	1.9	57.1	2.5	0.8	0.5	5.4	1.37	34.104	. .	33.363
	55	ι Virginis	. .	3	III–VII	64	15	2.9	58.0	5.9	3.2	2.6	6.8	3.23	26.757	. .	26.012
	56	Weisse XIV, 314	8.8	3	III–VII	55	45	1.1	56.0	2.2	2.4	1.1	4.9	1.28	27.166	. .	26.419
	57	Anon. 14^{h} 29^{m} 10^{s}	8.0	3	III–VII	21	10	0.7	54.3	1.7	0.3	1.7	4.1	0.47	26.137	. .	25.384
	58	ζ Bootis	. .	3	V–IX	44	40	6.9	0.9	8.0	6.9	7.1	11.1	6.82	35.931	. .	35.177
	59	Weisse (2) XIV, 932	8.2	3	IV–VI	22	20	3.8	0.7	8.1	5.7	6.5	9.7	5.75	32.001	. .	31.253
	60	Weisse (2) XIV, 936	8.3	2	I, IX	“	“	“	“	“	“	“	“	“	34.370	. .	33.588
	61	Anon. 14^{h} 57^{m} 55^{s}	9.2	3	III–VII	48	30	3.8	59.2	5.9	5.9	5.2	8.7	4.78	32.941	. .	32.193
	62	26 Libræ	6.0	3	III–VII	76	10	4.2	59.3	8.1	6.9	5.2	7.9	5.27	29.917	. .	29.174
	63	Anon. 15^{h} 16^{m} 54^{s}	8.3	3	III–VII	95	55	7.1	2.8	10.8	8.7	7.8	11.4	8.10	33.753	−0.746	33.014

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	30.046	74.2	72.0	+ 40.8	S. 27 55 44.2	29.6	+ 10 57 25.0	+ 5.8	Y.	
2	. .	. .	. .	+ 59.0	12 21 1.6	12.2	+ 26 32 25.0	+ 1.1	Y.	
3	. .	. .	71.5	— 2 34.0	61 52 28.3	1 44.1	— 23 0 33.6	+ 17.0	Y.	
4	. .	. .	. .	— 1 19.9	65 18 45.0	2 0.9	— 26 27 7.1	+ 18.1	Y.	
5	. .	. .	. .	+ 2 43.0	69 22 44.8	2 27.6	— 30 31 33.6	+ 19.2	Y.	
6	30.060	73.5	70.2	+ 53.9	7 25 56.6	7.3	+ 31 27 34.9	+ 1.6	Y.	
7	. .	. .	69.5	— 2 24.1	80 22 38.6	5 17.9	— 41 34 17.7	+ 21.6	Y.	
8	. .	. .	. .	+ 58.4	50 56 5.2	1 9.1	— 12 3 35.5	+ 14 9	Y.	
9	. .	. .	. .	— 17.3	40 39 49 6	48.2	— 1 46 59.0	+ 12.3	Y.	
10	30.064	73.0	68.2	+ 35.6	50 40 39.1	1 8.6	— 11 48 8.9	+ 15.1	Y.	
11	. .	. .	. .	+ 28.7	67 15 32.2	2 13.4	— 28 24 6.8	+ 18.7	Y.	
12	30.067	72.5	67.8	— 1 10.0	75 33 52.4	3 34.9	— 36 43 48.5	+ 20.1	Y.	
13	. .	. .	. .	— 1 54.8	68 3 11.8	2 18.8	— 29 11 51.8	+ 18.7	Y.	
14	. .	. .	. .	+ 14.4	51 40 22.1	1 11.2	— 12 47 54.5	+ 15.4	Y.	
15	. .	. .	. .	— 59.4	62 54 1.4	1 49.8	— 24 2 12.4	+ 17.4	Y.	
16	. .	. .	. .	— 2 40.7	24 37 24.6	25.9	+ 14 15 48.3	+ 10.2	Y.	
17	30.064	71.8	65.5	+ 22.7	S. 70 45 27.6	2 40.5	— 31 54 29.3	+ 18.2	Y.	
18	. .	. .	. .	+ 17.5	N. 11 14 32.9	11.3	+ 50 8 23.0	+ 4.7	Y.	
19	. .	. .	. .	— 2 34.0	S. 62 22 29.1	1 47.7	— 23 30 38.0	+ 16.6	Y.	
20	. .	. .	. .	— 2 9.9	59 7 56.2	1 34.5	— 20 15 51.9	+ 16.0	Y.	
21	30.074	70.8	64.6	+ 1 9.7	23 1 15.8	24.1	+ 15 51 58.9	+ 11.1	Y.	
22	. .	. .	. .	. . .	. . . . .	. .	. . . . .	. .	Y.	
23	30.174	72.0	66.5	— 1 33.9	73 53 31.3	3 13.4	— 35 3 5.9	+ 20.1	Y.	
24	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
25	30.175	74.5	74.3	+ 1 35.2	45 41 39.8	57.1	— 6 48 58.1	+ 12.3	Y.	
26	. .	. .	. .	+ 22.4	41 45 24.3	49.8	— 2 52 35.3	+ 11.4	Y.	
27	. .	. .	. .	+ 1 10.1	42 1 14.1	50.4	— 3 8 25.7	+ 11.6	Y.	
28	30.188	74.3	73.3	— 59.8	79 44 7.3	4 58.4	— 40 55 26.9	+ 21.8	Y.	
29	. .	. .	. .	+ 2 4.6	69 42 7.0	2 30.1	— 30 50 58.3	+ 19.6	Y.	
30	. .	. .	. .	+ 1 7.7	50 56 8.3	1 8.9	— 12 3 38.4	+ 14.8	Y.	
31	. .	. .	. .	— 11.4	40 39 53.2	48.1	— 1 47 2.5	+ 12.0	Y.	
32	30.190	74.0	72.0	— 1 44.2	20 23 18.3	20.9	+ 18 29 59.6	+ 6.9	Y.	
33	. .	. .	. .	+ 25.1	76 0 29.9	3 41.0	— 37 10 32.1	+ 20.6	Y.	
34	. .	. .	. .	— 1 49.1	68 3 15.0	2 18.4	— 29 11 54.6	+ 18.9	Y.	
35	30.195	74.0	71.1	— 2 57.8	72 57 6.1	3 1.0	— 34 6 28.3	+ 19.7	Y.	
36	. .	. .	. .	— 1 3.2	62 54 1.4	1 49.4	— 24 2 12.0	+ 17.6	Y.	
37	. .	. .	. .	— 2 34.3	24 37 26.2	25.8	+ 14 15 46.8	+ 9.7	Y.	
38	. .	. .	. .	— 35.9	2 19 27.2	2.3	+ 36 34 9.3	+ 5.5	Y.	
39	. .	. .	. .	— 1 49.2	S. 2 18 14.0	2.3	+ 36 35 22.5	+ 5.6	Y.	
40	. .	. .	. .	+ 18.3	N. 11 14 33.0	11.2	+ 50 8 23.0	+ 3.8	Y.	
41	30.200	73.4	69.7	— 2 18.5	S. 67 52 44.9	2 17.6	— 29 1 23.7	+ 17.6	Y.	
42	. .	. .	. .	— 48.7	S. 75 59 17.1	3 41.7	— 37 9 20.0	+ 18.1	Y.	
43	. .	. .	. .	— 11.4	N. 20 30 10.0	21.1	+ 59 24 9.9	+ 4.6	Y.	
44	. .	. .	. .	+ 14.6	S. 67 45 18.2	2 17.0	— 28 53 56.4	+ 16.4	Y.	
45	. .	. .	. .	+ 39.5	67 15 43.0	2 13.7	— 28 24 17.9	+ 16.1	Y.	
46	. .	. .	. .	+ 1 45.7	72 26 52.4	2 56.3	— 33 36 9.9	+ 16.1	Y.	
47	30.200	73.0	68.8	+ 1 38.8	72 26 45.4	2 56.3	— 33 36 2.9	+ 16.1	Y.	
48	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
49	30.084	73.5	72.5	+ 2 2.1	48 57 7.0	1 4.1	— 10 4 32.3	+ 13.6	Y.	
50	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
51	. .	. .	. .	— 58.1	48 24 3.0	1 2.9	— 9 31 27.1	+ 13.9	Y.	
52	30.096	73.2	71.3	— 1 29.2	16 28 35.1	16.6	+ 22 24 47.1	+ 4.8	Y.	
53	. .	. .	. .	— 1 45.8	75 33 20.5	3 33.7	— 36 43 15.4	+ 20.9	Y.	
54	. .	. .	. . .	— 1 45.4	68 3 16.0	2 18.1	— 29 11 55.3	+ 19.1	Y.	
55	30.100	73.0	70.2	+ 2 5.0	44 17 8.2	54.7	— 5 24 24.1	+ 13.3	Y.	
56	. .	. .	. .	+ 1 52.2	35 46 53.5	40.5	+ 3 6 4.8	+ 11.1	Y.	
57	. .	. .	. .	+ 2 24.7	1 12 25.1	1.2	+ 37 41 12.5	+ 3.2	Y.	
58	. .	. .	. .	— 2 42.3	24 37 24.6	25.8	+ 14 15 48.4	+ 8.7	Y.	
59	. .	. .	. .	— 39.2	2 19 26.5	2.3	+ 36 34 10.0	+ 4.1	Y.	
60	. .	. .	. .	— 1 52.5	2 18 13.3	2.3	+ 36 35 23.2	+ 4.2	Y.	
61	. .	. .	. .	— 1 8.7	28 28 56.1	30.5	+ 10 24 12.2	+ 10.1	Y.	
62	30.100	72.0	68.5	+ 25.9	56 10 31.1	1 23.8	— 17 18 16.1	+ 15.6	Y.	
63	. .	. .	. .	— 1 34.4	S. 75 53 33.7	3 40.0	— 37 3 34.9	+ 18.4	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. June 10	1	Lalande 28391 . .	8.5	3	III–VII	31 45 2.7	59.3	6.0	2.9	4.3	7.6	3.80	29.440	−0.746	28.689
	2	B. A. C. 5215 . .	7.0	3	III–VII	87 15 1.6	56.8	2.9	4.2	0.4	4.2	1.68	29.398	. .	28.657
	3	γ Serpentis . . .	5.0	3	IV–VI	42 50 5.9	3.4	9.7	8.7	8.3	10.4	7.73	32.603	. .	31.856
	4	O. Arg. S. 15240 .	5.8	3	III–VII	79 25 3.7	1.8	6.9	6.0	4.8	8.5	5.28	32.729	. .	31.987
	5	Nadir	. .	.	. .	199 59 58.2	53.0	61.1	58.3	56.7	63.1	58.40	30.546	. .	. .
16	6	75 Virginis	. .	3	III–VII	73 35 0.2	55.1	2.3	1.9	59.4	3.9	0.47	29.207	−0.804	28.406
	7	83 Virginis	. .	3	III–VII	74 25 4.1	57.2	6.9	6.1	3.6	8.1	4.33	29.819	. .	29.018
	8	Weisse (2) XIII, 976	8.0	3	III–VII	20 35 0.0	53.8	2.5	1.0	1.2	2.9	0.23	33.913	. .	33.101
	9	Anon. 13^h 53^m 49^s .	7.7	3	V–IX	95 45 2.4	57.6	5.0	3.2	1.4	6.5	2.68	36.333	. .	35.542
	10	Lacaille 5837. . .	7.0	3	IV–VI	88 55 1.6	56.8	4.0	2.0	1.2	5.9	1.92	34.227	. .	33.425
	11	Lacaille 5873. . .	7.0	3	III–VII	90 20 3.2	57.7	5.1	3.8	1.7	5.9	2.90	31.110	. .	30.312
	12	Weisse XIV, 314 .	8.5	3	III–VII	55 45 0.9	55.2	3.1	4.1	1.4	6.1	1.80	27.166	. .	26.361
	13	Anon. 14^h 29^m 50^s .	9.0	3	III–VII	86 35 5.0	1.4	8.1	8.2	4.4	9.8	6.15	34.053	. .	33.254
	14	34 Bootis	5.5	3	III–VII	31 50 4.7	0.9	7.3	5.7	5.7	9.0	5.55	31.079	. .	30.270
	15	Lacaille 6186 . .	6.0	3	III–VII	96 25 0.4	57.8	4.3	2.5	1.2	4.7	1.82	33.206	. .	32.409
	16	Lacaille 6239 . .	7.0	3	III–VII	96 54 58.0	55.6	61.9	60.1	57.3	62.2	59.18	34.176	. .	33.379
	17	Anon. 15^h 13^m 24^s .	8.8	3	III–VII	96 0 0.0	57.5	3.9	2.9	0.8	4.9	1.67	32.150	. .	31.353
	18	Anon. 15^h 19^m 49^s .	. .	3	IV–VI	20 15 6.9	2.0	10.9	8.5	6.7	9.7	7.45	29.736	. .	28.930
	19	Lalande 28391 . .	9.0	3	III–VII	31 45 4.7	0.9	8.2	7.9	5.8	9.7	6.20	29.586	. .	28.777
	20	B. A. C. 5198 . .	6.0	3	III–VII	86 30 4.1	0.4	7.4	9.2	3.0	8.4	5.37	27.399	. .	26.600
	21	γ Serpentis	5.0	3	III–VII	42 50 5.0	2.6	8.6	8.4	5.3	9.5	6.57	32.610	. .	31.803
	22	Weisse (2) XV, 1081	7.5	3	III–VII	52 30 0.7	55.8	2.7	2.9	59.7	5.5	1.22	32.225	. .	31.420
	23	Lalande 29654 . .	7.2	3	III–VII	20 30 5.8	1.8	10.1	7.8	6.8	9.1	6.90	30.348	. .	29.536
	24	Anon. 16^h 18^m 6^s .	7.8	3	III–VII	82 0 2.8	59.4	6.0	5.8	2.2	5.6	3.63	32.696	. .	31.896
	25	Lacaille 6922 . .	. .	3	III–VII	92 20 5.1	2.3	8.8	8.7	4.3	7.9	6.18	29.729	. .	28.931
	26	Lacaille 6999 (1st *).	6.5	3	III–VII	96 10 3.9	2.4	8.1	8.7	4.4	7.1	5.77	35.010	. .	34.213
	27	Nadir	. .	.	. .	200 0 1.9	56.8	5.1	4.8	0.1	6.3	2.50	30.735	. .	. .
18	28	g Centauri	. .	3	V–IX	92 40 0.9	56.8	4.1	4.4	58.1	3.0	1.22	29.736	−0.751	28.996
	29	Weisse (2) XIV, 1314	. .	3	III–VII	23 55 6.2	2.2	9.1	7.3	4.4	8.3	6.25	31.636	. .	30.878
	30	50 Hydræ	6.0	3	III–VII	85 30 2.0	58.4	6.4	5.0	1.8	4.6	3.03	26.638	. .	25.892
	31	Lacaille 5898. . .	7.0	3	III–VII	93 0 3.1	1.4	6.8	7.8	1.5	5.5	4.35	36.157	. .	35.411
	32	106 Virginis	6.0	3	III–VII	65 15 6.9	2.6	10.4	9.9	7.2	10.0	7.83	34.441	. .	33.691
	33	Anon. 14^h 29^m 45^s .	9.0	3	III–VII	86 35 3.9	2.5	9.1	10.2	4.5	8.7	6.48	34.636	. .	33.890
	34	Nadir	. .	.	. .	200 0 1.1	57.8	4.7	5.6	58.8	5.9	2.32	30.667	. .	. .
	35	B. A. C. 4941 . .	6.0	3	V–IX	61 10 3.4	0.2	7.2	6.5	3.4	6.2	4.48	33.852	. .	33.099
	36	23 Libræ	. .	3	III–VII	83 40 6.4	4.9	10.8	11.7	6.2	9.3	8.22	26.839	. .	26.092
	37	B. A. C. 5062 . .	6.5	3	III–VII	85 5 2.2	0.0	7.4	7.0	3.2	6.3	4.35	28.405	. .	27.659
	38	39 Libræ	5.0	3	III–VII	86 35 1.2	59.6	5.7	7.3	1.2	5.4	3.40	31.053	. .	30.307
	39	B. A. C. 5195 . .	. .	3	III–VII	88 30 2.9	1.7	7.6	8.5	3.6	6.7	5.17	30.306	. .	29.560
	40	γ Serpentis	. .	3	III–VII	42 50 1.9	0.4	6.2	6.4	2.2	4.3	3.57	32.532	. .	31.778
	41	B. A. C. 5314 . .	5.8	3	III–VII	84 25 1.2	0.4	8.6	7.9	3.0	5.7	4.47	35.056	. .	34.310
	42	B. A. C. 5374 . .	. .	3	III–VII	87 55 0.9	59.4	4.8	5.9	0.2	4.5	2.62	27.729	. .	26.983
	43	B. A. C. 5429 . .	5.5	3	III–VII	87 10 2.2	0.3	7.7	7.4	2.4	5.3	4.22	31.418	. .	30.672
	44	χ Ophiuchi	5.0	3	III–VII	77 5 0.9	0.0	6.8	5.9	2.2	4.4	3.37	35.339	. .	34.591
	45	B. A. C. 5538 . .	. .	3	III–VII	93 50 5.1	3.9	9.5	10.3	5.7	8.0	7.08	30.212	. .	29.468
	46	39 Herculis	. .	3	III–VII	31 45 2.8	0.9	9.1	8.8	3.9	6.6	5.35	32.810	. .	32.054
	47	23 Ophiuchi	5.5	3	III–VII	64 50 3.9	0.4	8.1	9.3	2.3	6.2	5.03	31.445	. .	30.695
	48	Nadir	. .	.	. .	200 0 0.2	59.1	4.7	7.8	57.8	4.9	2.42	30.674	. .	. .
21	49	86 Virginis	. .	3	V–IX	70 40 2.7	56.2	3.2	0.8	0.4	6.1	1.57	29.408	−0.766	28.643
	50	47 Hydræ	. .	3	III–VII	83 15 2.2	56.1	4.2	1.8	59.2	5.7	1.53	33.103	. .	32.341
	51	π Hydræ	. .	3	III–VII	84 55 0.9	54.7	3.9	1.2	0.3	5.5	1.08	27.445	. .	26.684
	52	50 Hydræ	. .	3	III–VII	85 29 61.0	52.9	62.6	60.7	58.7	63.7	59.93	26.426	. .	25.665
	53	Lacaille 5898 . .	. .	3	III–VII	93 0 1.1	54.1	2.2	1.4	58.1	3.9	0.13	36.237	. .	35.477
	54	106 Virginis	. .	3	III–VII	65 15 2.6	56.2	4.9	1.3	2.7	7.0	2.45	34.240	. .	33.475
	55	Anon. 14^h 29^m 47^s .	9.2	3	III–VII	86 35 5.9	0.7	8.5	7.2	5.2	10.9	6.40	34.462	. .	33.701
	56	B. A. C. 4858 . .	. .	3	III–VII	93 30 1.9	55.5	2.3	1.8	0.7	5.5	1.37	29.769	. .	29.010
	57	B. A. C. 4901 . .	. .	3	IV–VI	96 10 1.8	56.2	4.8	2.2	0.8	5.6	1.90	35.543	. .	34.779
	58	B. A. C. 4941 . .	. .	3	III–VII	61 10 3.1	56.3	4.7	1.8	2.1	6.3	2.38	33.700	. .	32.934
	59	23 Libræ	. .	3	III–VII	83 40 6.2	1.1	8.8	6.2	5.5	9.2	6.17	26.698	. .	25.936
	60	2 Lupi	. .	3	III–VII	88 35 4.2	59.8	4.8	2.0	1.4	7.2	3.23	35.006	. .	34.245
	61	Anon. 15^h 18^m 30^s .	7.0	3	III–VII	95 0 6.8	2.7	10.7	8.0	7.2	10.6	7.67	31.287	. .	30.528
	62	39 Libræ	. .	3	V–IX	86 35 0.9	56.6	3.8	2.8	0.7	6.1	1.82	30.919	. .	30.159
	63	B. A. C. 5195 . .	. .	3	III–VII	88 30 1.8	55.9	3.2	1.1	0.3	6.2	1.42	30.105	. .	29.344
	64	ρ Scorpii	5.0	3	III–VII	87 45 2.0	56.0	3.1	0.9	58.8	4.8	0.93	35.592	. .	34.831
	65	B. A. C. 5314 . .	. .	3	III–VII	84 25 3.8	58.4	7.5	4.4	3.8	7.7	4.27	34.969	. .	34.208
	66	B. A. C. 5374 . .	6.0	3	III–VII	87 55 1.2	55.1	2.2	0.4	58.3	4.4	0.27	27.544	−0.766	26.783

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. . .	. .	. .	+ 41.1	S. 11 45 44.9	11.7	+ 27 7 42.2	+ 7.7	Y.	Saw but one.
2	30.106	72.0	68.0	+ 42.1	67 15 43.8	2 13.6	− 28 24 18.6	+ 16.3	Y.	
3	. .	. .	. .	− 58.2	22 49 9.6	23.7	+ 16 4 5.5	+ 10.0	Y.	
4	30.110	71.5	67.8	− 1 2.3	59 24 3.0	1 35.0	− 20 31 59.2	+ 14.6	Y.	
5	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
6	29.950	73.0	69.5	+ 50.0	53 35 50.4	1 15.7	− 14 43 27.3	+ 15.5	Y.	
7	. .	. .	. .	+ 30.8	54 25 35.1	1 18.1	− 15 33 14.4	+ 15.9	Y.	
8	. .	. .	. .	− 1 37.2	0 33 23.0	0.5	+ 38 20 15.3	+ 0.2	Y.	
9	29.960	72.5	68.1	− 2 53.7	75 42 9.0	3 36.1	− 36 52 6.3	+ 21.6	Y.	
10	. .	. .	. .	− 1 47.3	68 53 14.6	2 24.2	− 30 2 0.0	+ 19.8	Y.	
11	. .	. .	. .	− 9.8	70 19 53.1	2 35.6	− 31 28 49.9	+ 20.1	Y.	
12	. .	. .	. .	+ 1 54.1	35 46 55.9	40.5	+ 3 6 2.4	+ 10.9	Y.	
13	29.968	71.8	66.9	− 1 42.0	66 33 24.2	2 8.9	− 27 41 54.3	+ 18.9	Y.	
14	. .	. .	. .	− 8.5	11 49 57.1	11.8	+ 27 3 29.9	+ 5.1	Y.	
15	29.970	71.2	66.5	− 1 15.5	76 23 46.3	3 48.0	− 37 33 55.5	+ 20.3	Y.	
16	. .	. .	. .	− 1 45.9	76 53 13.3	3 56.6	− 38 3 31.1	+ 20.1	Y.	
17	. .	. .	. .	− 42.4	75 59 19.3	3 41.6	− 37 9 22.1	+ 19.4	Y.	
18	. .	. .	. .	+ 33.5	0 15 41.0	0.3	+ 38 37 57.5	+ 4.4	Y.	
19	. .	. .	. .	+ 38.3	11 45 44.5	11.7	+ 27 7 42.6	+ 6.8	Y.	Only star.
20	29.972	70.5	65.3	+ 1 46.6	66 31 51.9	2 9.1	− 27 40 22.2	+ 16.8	Y.	
21	. .	. .	. .	− 56.5	22 49 10.1	23.7	+ 16 4 5.0	+ 9.2	Y.	
22	. .	. .	. .	− 44.5	32 29 16.7	35.9	+ 6 23 46.2	+ 10.8	Y.	
23	. .	. .	. .	+ 14.5	0 30 21.4	0.5	+ 38 23 16.9	+ 6.5	Y.	
24	. .	. .	. .	− 59.4	61 59 4.2	1 45.7	− 23 7 11.1	+ 14.4	Y.	
25	29.970	70.0	64.8	+ 33.5	72 20 39.7	2 55.4	− 33 29 56.3	+ 14.7	Y.	
26	. .	. .	. .	− 2 12.0	76 7 53.7	3 44.4	− 37 17 59.3	+ 14.3	Y.	
27	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
28	29.964	70.0	63.2	+ 31.5	72 40 32.7	2 59.4	− 33 49 53.3	+ 20.9	Y.	
29	. .	. .	. .	− 27.5	3 54 38.8	3.9	+ 34 58 56.1	+ 1.3	Y.	
30	. .	. .	. .	+ 2 8.7	65 32 11.8	2 4.0	− 26 40 37.0	+ 18.9	Y.	
31	29.970	69.8	62.2	− 2 49.6	72 57 14.8	3 2.8	− 34 6 38.8	+ 20.7	Y.	Faint.
32	. .	. .	. .	− 1 55.7	45 13 12.1	57.2	− 6 20 30.5	+ 13.3	Y.	
33	. .	. .	62.0	− 2 1.9	66 33 4.6	2 10.1	− 27 41 35.9	+ 18.8	Y.	
34	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
35	29.972	68.5	60.9	− 1 37.1	41 8 27.4	49.6	− 2 15 38.2	+ 12.3	Y.	Unsteady.
36	. .	. .	. .	+ 2 2.5	63 42 10.7	1 54.6	− 24 50 26.5	+ 17.4	Y.	
37	. .	. .	. .	+ 1 13.4	65 6 17.7	2 0.9	− 26 14 39.8	+ 17.4	Y.	
38	. .	. .	. .	− 9.6	66 34 53.8	2 10.9	− 27 43 25.9	+ 17.2	Y.	
39	29.962	67.8	59.4	+ 13.8	68 30 19.0	2 23.8	− 29 39 4.0	+ 17.2	Y.	
40	. .	. .	. .	− 55.7	22 49 7.8	24.0	+ 16 4 7.0	+ 8.8	Y.	
41	. .	. .	. .	− 2 15.1	64 22 49.4	1 58.5	− 25 31 9.1	+ 15.7	Y.	
42	. .	. .	. .	+ 1 34.5	67 56 37.2	2 20.0	− 29 5 18.4	+ 15.9	Y.	
43	. .	. .	. .	− 21.1	67 9 43.2	2 14.8	− 28 18 19.2	+ 15.4	Y.	
44	29.952	67.0	58.5	− 2 23.9	57 2 39.5	1 27.9	− 18 10 28.6	+ 13.7	Y.	
45	. .	. .	. .	+ 16.7	73 50 23.7	3 14.7	− 34 59 59.6	+ 15.2	Y.	
46	. .	. .	. .	− 1 4.4	11 44 1.0	11.9	+ 27 9 25.9	+ 8.0	Y.	
47	29.966	66.3	57.2	− 21.8	44 49 43.3	56.9	− 5 57 1.4	+ 11.3	Y.	
48	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
49	30.084	76.0	75.2	+ 42.5	50 40 44.1	1 7.7	− 11 48 13.0	+ 14.4	Y.	
50	. .	. .	. .	− 1 13.4	63 13 48.2	1 49.7	− 24 21 59.1	+ 18.3	Y.	
51	. .	. .	. .	+ 1 43.9	64 56 45.0	1 58.4	− 26 5 4.6	+ 18.7	Y.	
52	30.083	76.0	74.0	+ 2 15.9	65 32 15.8	2 1.7	− 26 40 38.7	+ 18.9	Y.	
53	. .	. .	. .	− 2 51.7	72 57 8.5	2 59.5	− 34 6 29.2	+ 20.8	Y.	
54	. .	. .	. .	− 1 49.0	45 13 13.5	56.1	− 6 20 30.8	+ 13.1	Y.	
55	. .	. .	. .	− 1 56.0	66 33 10.4	2 8.0	− 27 41 39.6	+ 18.9	Y.	
56	30.092	75.5	72.2	+ 31.0	73 30 32.4	3 6.2	− 34 39 59.8	+ 20.4	Y.	
57	. .	. .	. .	− 2 29.7	76 7 32.1	3 42.0	− 37 17 35.3	+ 20.7	Y.	
58	. .	. .	. .	− 1 31.9	41 8 30.4	48.8	− 2 15 40.4	+ 12.0	Y.	
59	. .	. .	. .	+ 2 7.3	63 42 13.5	1 52.7	− 24 50 27.4	+ 17.4	Y.	
60	30.100	75.0	71.4	− 2 13.1	68 32 50.2	2 21.4	− 29 41 32.8	+ 18.3	Y.	
61	. .	. .	. .	− 16.5	74 59 51.1	3 25 6	− 36 9 37.9	+ 16.4	Y.	
62	. .	. .	. .	− 5.0	66 34 56.9	2 8.5	− 27 43 26.6	+ 17.2	Y.	
63	30.104	74.8	70.8	+ 20.6	68 30 22.0	2 21.3	− 29 39 4.5	+ 17.2	Y.	
64	. .	. .	. .	− 2 31.4	67 42 29.5	2 15.8	− 28 51 6.5	+ 16.6	Y.	
65	. .	. .	. .	− 2 11.9	64 22 52.4	1 56.5	− 25 31 10.1	+ 15.8	Y.	
66	. .	. .	. .	+ 1 40.8	S. 67 56 41.1	2 17.4	− 29 5 19.7	+ 16.0	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
1875.						° ′ ″	″	″	″	″	″	″	r.	r.	r.
June 21	1	B. A. C. 5429	. .	3	III–VII	87 10 2.7	57.8	6.3	4.5	1.5	6.6	3.23	31.296	−0.766	30.535
	2	χ Ophiuchi	4.5	3	III–VII	77 5 2.4	56.2	5.2	2.2	1.9	6.6	2.42	35.275	. .	34.512
	3	B. A. C. 5538	. .	3	III–VII	93 50 3.7	58.7	5.8	4.8	3.0	7.3	3.88	29.969	. .	29.210
	4	39 Herculis	. .	3	III–VII	31 45 4.0	58.1	6.8	3.4	3.4	7.9	3.93	32.778	. .	32.007
	5	23 Ophiuchi	5.5	3	III–VII	64 50 2.7	55.2	4.1	1.5	0.3	5.1	1.48	31.280	. .	30.515
	6	26 Ophiuchi	5.5	3	III–VII	83 40 3.1	58.8	5.4	5.1	1.7	6.3	3.40	31.348	. .	30.586
	7	Nadir	. .	.	. .	200 0 4.7	58.9	7.8	6.8	1.1	9.7	4.83	30.772	. .	. .
23	8	Lacaille 6922	6.8	3	III–VII	92 20 5.0	57.4	5.9	3.0	1.8	8.7	3.63	29.395	−0.644	28.757
	9	Lalande 30745	8.5	3	III–VII	20 45 5.5	58.8	7.7	4.0	6.6	10.4	5.50	32.852	. .	32.200
	10	Lalande 31055	8.0	3	III–VII	63 45 4.0	56.7	5.1	2.6	2.3	9.0	3.28	32.495	. .	31.852
	11	B. A. C. 5792	6.5	3	III–VII	86 30 2.3	55.8	3.7	2.2	0.8	7.3	2.02	34.363	. .	33.724
	12	B. A. C. 5846	. .	3	III–VII	83 39 60.9	53.9	61.8	59.1	58.7	65.1	59.92	33.222	. .	32.582
	13	Anon. $17^h\ 21^m\ 16^s$	8.0	3	III–VII	21 0 5.8	58.9	7.9	3.9	6.4	10.8	5.62	31.023	. .	30.372
	14	Anon. $17^h\ 31^m\ 21^s$	8.5	3	III–VII	90 59 61.0	54.4	61.6	58.8	58.8	64.6	59.87	32.365	. .	31.727
	15	Anon. $17^h\ 32^m\ 52^s$	8.0	3	V–IX	“ “ “	“	“	“	“	“	“	30.966	. .	30.332
	16	B. A. C. 6044	6.5	3	III–VII	86 5 4.1	58.2	5.9	3.9	2.8	7.7	3.77	27.235	. .	26.596
	17	Anon. $17^h\ 54^m\ 29^s$	6.0	3	III–VII	22 35 8.0	1.9	9.7	5.7	7.1	13.1	7.58	29.474	. .	28.823
	18	Anon. $18^h\ 5^m\ 8^s$	8.0	3	III–VII	22 25 5.4	0.4	8.0	4.3	6.8	11.2	6.02	32.828	. .	32.177
	19	Lacaille 7662	. .	3	III–VII	96 24 58.9	53.0	61.6	57.8	57.3	63.0	58.60	35.692	. .	35.055
	20	25 Sagittarii	6.5	3	III–VII	83 10 7.2	1.2	9.4	7.2	4.4	10.9	6.72	29.215	. .	28.575
	21	Lacaille 7846	5.5	3	III–VII	99 20 2.7	55.8	3.7	0.6	59.8	5.7	1.38	28.397	. .	27.761
	22	B. A. C. 6435	6.0	3	III–VII	96 25 4.9	1.2	8.1	5.7	4.8	9.1	5.63	35.715	. .	35.078
	23	Anon. 18 $57^m\ 22^s$	9.2	3	III–VII	67 40 4.4	58.3	6.9	4.3	3.8	10.2	4.65	32.693	. .	32.050
	24	Nadir	. .	.	. .	200 0 2.5	54.8	3.9	1.8	59.1	8.2	1.72	30.549	. .	. .
July 2	25	Lalande 31055	. .	3	III–VII	63 45 4.8	57.9	6.8	5.9	0.8	5.8	3.67	32.558	−0.604	31.955
	26	B. A. C. 5818	7.0	3	III–VII	89 5 3.0	57.7	4.7	2.9	58.6	4.7	1.93	32.710	. .	32.112
	27	B. A. C. 5846	6.5	3	III–VII	83 40 2.0	56.1	3.9	2.9	58.8	2.9	1.10	33.338	. .	32.738
	28	Anon. $17^h\ 21^m\ 16^s$	7.7	3	III–VII	21 0 7.8	3.1	11.7	12.0	8.1	11.0	8.95	31.142	. .	30.531
	29	Anon. $17^h\ 31^m\ 54^s$	7.5	1	V	90 59 57.9	52.8	60.8	58.2	54.7	59.3	57.28	31.888	. .	31.284
	30	Anon. $17^h\ 32^m\ 52^s$	8.0	3	V–IX	“ “ “	“	“	“	“	“	“	30.992	. .	30.398
	31	Anon. $17^h\ 45^m\ 29^s$	8.2	1	V	93 40 5.1	0.7	8.2	7.7	2.8	6.6	5.18	31.735	. .	31.131
	32	Anon. $17^h\ 45^m\ 44^s$	7.7	2	VII, IX	“ “ “	“	“	“	“	“	“	33.360	. .	32.774
	33	Anon. $17^h\ 57^m\ 35^s$	9.0	3	V–IX	96 15 1.2	57.2	6.2	3.1	59.4	2.9	1.67	28.156	. .	27.565
	34	Anon. $18^h\ 5^m\ 32^s$	6.0	3	III–VII	20 25 5.0	1.0	10.8	9.2	6.3	6.2	6.42	27.581	. .	26.969
	35	B. A. C. 6217	6.0	3	III–VII	83 50 0.5	56.5	4.5	3.1	59.2	2.1	0.98	30.643	. .	30.043
	36	Lalande 34274	. .	3	V–IX	23 10 4.6	1.3	9.2	8.6	3.7	7.8	5.87	29.417	. .	28.795
	37	Lacaille 7815	7.0	3	III–VII	92 50 3.3	0.4	8.2	7.9	1.2	5.0	4.33	32.986	. .	32.388
	38	Lacaille 7846	6.0	3	IV–VI	99 19 59.0	55.4	62.7	61.6	64.8	59.0	60.42	28.456	. .	27.855
	39	Anon. $18^h\ 47^m\ 49^s$	8.3	3	IV–VI	92 15 3.9	1.8	8.8	8.2	2.1	5.1	4.98	29.516	. .	28.914
	40	Anon. $18^h\ 48^m\ 10^s$	8.3	2	VII, IX	“ “ “	“	“	“	“	“	“	28.238	. .	27.655
	41	Nadir	. .	.	. . .	200 0 3.3	59.8	9.1	7.5	1.2	6.9	4.63	30.601	. .	. .
7	42	ρ Scorpii	5.0	3	III–VII	87 44 61.1	53.2	62.9	57.2	59.2	63.2	59.47	35.569	−0.858	34.716
	43	B. A. C. 5365	6.5	3	III–VII	83 5 3.6	55.4	6.0	0.8	2.2	4.9	2.15	26.888	. .	26.034
	44	Lacaille 6815 (1st *)	7.5	3	III–VII	91 45 6.0	58.9	9.0	2.7	4.6	7.7	4.82	30.235	. .	29.383
	45	Lacaille 6815 (2d *)	7.7	2	I, IX	“ “ “	“	“	“	“	“	“	30.003	. .	29.176
	46	Lacaille 6922	7.0	3	III–VII	92 20 7.0	58.8	8.8	5.1	5.2	8.2	5.52	29.700	. .	28.848
	47	Anon. $16^h\ 35^m\ 16^s$	8.5	3	III–VII	89 0 5.1	57.9	8.2	1.6	4.4	8.2	4.23	29.399	. .	28.547
	48	Lalande 30745	8.0	3	III–VII	20 45 9.5	3.1	12.7	7.8	11.2	10.8	9.18	33.282	. .	32.416
	49	Weisse XVI, 1033	9.0	3	III–VII	68 0 4.9	58.0	9.1	3.7	5.3	9.0	5.00	33.272	. .	32.416
	50	Lalande 31199	7.5	3	III–VII	79 20 3.6	58.0	7.2	1.1	3.8	6.2	3.32	27.568	. .	26.714
	51	B. A. C. 5846	6.5	3	III–VII	83 40 2.8	56.2	5.7	0.0	1.4	4.6	1.78	33.503	. .	32.649
	52	Lacaille 7312	6.5	3	III–VII	92 30 1.4	54.7	4.8	59.3	59.6	2.3	0.35	35.170	. . .	34.318
	53	Lacaille 7324	6.0	3	III–VII	“ “ “	“	“	“	“	“	“	36.205	. .	35.353
	54	O. Arg. S. 17133	8.5	3	III–VII	80 35 4.2	58.3	7.8	2.3	4.1	6.3	3.83	35.714	. .	34.860
	55	Anon. $17^h\ 44^m\ 52^s$	8.0	1	V	93 25 7.1	0.8	10.7	5.8	7.1	9.7	6.87	29.153	. .	28.295
	56	Anon. $17^h\ 46^m\ 32^s$	8.0	1	V	“ “ “	“	“	“	“	“	“	37.650	. .	36.792
	57	Anon. $17^h\ 54^m\ 22^s$	6.0	2	VII, IX	22 35 4.1	58.2	8.8	4.2	4.8	8.7	4.80	29.764	. .	28.879
	58	Anon. $18^h\ 5^m\ 8^s$	8.0	3	III–VII	22 25 2.9	56.4	7.8	2.5	4.8	7.1	3.58	33.097	. .	32.232
	59	21 Sagittarii	5.5	3	III–VII	79 30 3.2	56.4	7.4	1.2	3.5	5.5	2.87	33.644	. .	32.790
	60	Lalande 34412	8.0	3	III–VII	21 35 8.8	1.8	13.0	6.3	9.2	11.9	8.50	34.164	. .	33.299
	61	Weisse XVIII, 1056	7.0	2	I, IX	64 54 60.6	53.1	63.6	59.0	59.8	62.2	59.72	29.046	. .	28.193
	62	Weisse XVIII, 1058	8.0	3	III–VII	“ “ “	“	“	“	“	“	“	25.457	. .	24.600
	63	Nadir	. .	.	. .	200 0 0.4	52.7	4.2	0.0	58.5	4.3	0.02	30.710	−0.858	. .

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	30.094	74.2	70.3	— 16.8	S. 67 9 46.5	2 12.3	— 28 18 20.0	+ 15.5	Y.	
2	. .	. . .	. .	— 2 21.4	57 2 41.0	1 26.3	— 18 10 28.5	+ 13.6	Y.	
3	. .	. .	. .	+ 24.7	73 50 28.6	3 10.9	— 35 0 0.7	+ 15.3	Y.	
4	. .	. .	. .	— 1 2.9	11 44 1.0	11.7	+ 27 9 26.1	+ 7.3	Y.	
5	. .	. .	. .	— 16.1	44 49 45.4	55.8	— 5 57 2.4	+ 11.0	Y.	
6	30.094	73.8	69.6	— 18.4	63 39 45.0	1 52.9	— 24 47 59.1	+ 12.8	Y.	
7	. .	. .	. .	. .	. . . . .	. .	. . . .	. .	Y.	
8	30.010	79.5	77.6	+ 39.0	72 20 42.6	2 51.3	— 33 29 55.1	+ 15.0	Y.	
9	. .	. .	. .	— 1 9.0	0 43 56.5	0.7	+ 38 9 41.6	+ 5.8	Y.	
10	. .	. .	. .	— 58.0	43 44 5.2	52.8	— 4 51 19.2	+ 10.3	Y.	
11	30.004	79.2	76.8	— 1 56.7	66 28 5.3	2 6.1	— 27 36 32.6	+ 12.3	Y.	
12	. .	. .	. .	— 1 21.0	63 38 39.0	1 51.0	— 24 46 51.2	+ 10.7	Y.	
13	. .	. .	. .	— 11.7	0 59 54.0	1.0	+ 37 53 43.8	+ 6.7	Y.	
14	. .	. .	. .	— 54.1	70 59 5.7	2 38.9	— 32 8 5.8	+ 10.7	Y.	
15	30.008	76.8	76.3	— 10.4	70 59 49.5	2 39.0	— 32 8 49.7	+ 10.6	Y.	
16	. .	. .	. .	+ 1 46.7	66 6 50.5	2 4.2	— 27 15 15.9	+ 9.4	Y.	
17	. .	. .	. .	+ 36.9	2 35 44.5	2.5	+ 36 17 51.8	+ 7.5	Y.	
18	. .	. .	. .	— 1 8.2	2 23 57.8	2.3	+ 36 29 38.7	+ 7.7	Y.	
19	29.990	78.4	75.4	— 2 38.4	76 22 20.2	3 43.7	— 37 32 25.1	+ 6.4	Y.	
20	. .	. .	. .	+ 44.7	63 10 51.4	1 49.0	— 24 19 1.6	+ 6.3	Y.	
21	29.996	78.2	75.4	+ 1 10.1	79 21 11.5	4 45.1	— 40 32 17.8	+ 4.8	Y.	
22	. .	. .	. .	— 2 39.2	76 22 26.5	3 43.9	— 37 32 31.6	+ 8.3	Y.	
23	29.996	78.2	75.3	— 1 4.2	47 39 0.4	1 0.7	— 8 46 22.3	+ 6.4	Y.	
24	. .	. .	. .	. .	. . . . .	. .	. . . .	. .	Y.	
25	30.126	76.0	67.4	— 1 1.3	43 44 2.4	54.0	— 4 51 17.6	+ 9.7	Y.	
26	. .	. .	. .	— 1 6.2	69 3 55.8	2 26.4	— 30 12 43.4	+ 12.9	Y.	
27	. .	. .	. .	— 1 25.8	63 38 35.3	1 53.5	— 24 46 50.0	+ 11.8	Y.	
28	30.124	75.7	66.8	— 16.6	0 59 52.3	1.0	+ 37 53 45.5	+ 4.4	Y.	
29	. .	. .	. .	— 40.3	70 59 17.0	2 42.4	— 32 8 20.6	+ 11.4	Y.	
30	. .	. .	. .	— 12.5	70 59 44.8	2 42.5	— 32 8 48.5	+ 11.3	Y.	
31	. .	. .	. .	— 35.4	73 39 29.7	3 10.3	— 34 49 1.2	+ 10.5	Y.	
32	30.114	74.0	66.2	— 1 26.9	73 38 38.2	3 10.2	— 34 48 9.6	+ 10.5	Y.	
33	. .	. .	. .	+ 1 16.3	76 16 18.0	3 47.5	— 37 26 26.7	+ 9.6	Y.	
34	. .	. .	. .	+ 1 35.0	0 26 41.4	0.4	+ 38 26 57.0	+ 5.2	Y.	
35	30.104	72.5	65.5	— 1.3	63 49 59.6	1 54.7	— 24 58 15.5	+ 7.5	Y.	
36	. .	. .	. .	+ 37.7	3 10 43.6	3.1	+ 35 42 52.1	+ 5.5	Y.	
37	. .	. .	. .	— 1 14.9	72 48 49.5	3 0.8	— 33 58 11.5	+ 6.3	Y.	
38	. .	. .	. .	+ 1 7.2	79 21 7.6	4 51.6	— 40 32 20.4	+ 5.8	Y.	
39	. .	. .	. .	+ 34.0	72 15 39.0	2 54.5	— 33 24 54.7	+ 4.8	Y.	
40	29.996	71.3	65.2	+ 1 13.5	72 16 18.5	2 54.6	— 33 25 34.3	+ 4.7	Y.	
41	. .	. .	. .	. .	. . . . .	. .	. . . .	. .	Y.	
42	30.190	83.5	78.0	— 2 27.8	67 42 31.7	2 14.3	— 28 51 7.2	+ 17.2	Y.	
43	. .	. .	. .	+ 2 4.3	63 7 6.4	1 48.9	— 24 15 16.5	+ 15.5	Y.	
44	. .	. .	. .	+ 19.3	71 45 24.2	2 46.7	— 32 54 32.1	+ 16.9	Y.	
45	30.205	82.8	77.2	+ 25.8	71 45 30.6	2 46.7	— 32 54 38.5	+ 19.9	Y.	
46	. .	. .	. .	+ 36.1	72 20 41.6	2 52.5	— 33 29 55.3	+ 16.0	Y.	
47	. .	. .	. .	+ 45.5	69 0 49.8	2 23.8	— 30 9 34.8	+ 15.2	Y.	
48	. .	. .	. .	— 1 15.7	0 43 53.4	0.7	+ 38 9 44.7	+ 2.4	Y.	
49	. .	. .	. .	— 1 15.7	47 58 49.3	1 1.6	— 9 6 12.1	+ 10.1	Y.	
50	30.200	81.8	76.3	+ 1 43.0	59 21 46.3	1 33.6	— 20 29 41.1	+ 11.7	Y.	
51	. .	. .	. .	— 1 23.0	63 38 38.7	1 51.8	— 24 46 51.7	+ 11.8	Y.	
52	. .	. .	. .	— 2 15.3	72 27 45.0	2 54.2	— 33 37 0.4	+ 12.5	Y.	
53	30.200	81.2	75.5	— 2 47.7	72 27 12.6	2 54.1	— 33 36 27.9	+ 12.5	Y.	
54	. .	. .	. .	— 2 32.3	60 32 31.5	1 38.3	— 21 40 31.0	+ 9.8	Y.	
55	. .	. .	. .	+ 53.5	73 26 0.3	3 4.8	— 34 35 26.3	+ 10.8	Y.	
56	. .	. .	. .	— 3 32.8	73 21 34.0	3 4.0	— 34 30 59.2	+ 10.6	Y.	
57	. .	. .	. .	+ 35.1	2 35 39.9	2.5	+ 36 17 56.4	+ 3.6	Y.	
58	. .	. .	. .	— 1 9.9	2 23 53.6	2.3	+ 36 29 42.9	+ 3.7	Y.	
59	. .	. .	. .	— 1 27.4	59 28 35.4	1 34.2	— 20 36 30.8	+ 6.9	Y.	
60	30.200	80.2	75.5	— 1 43.4	1 33 25.1	1.5	+ 37 20 12.2	+ 3.9	Y.	
61	. .	. .	75.3	+ 56.6	44 55 56.3	55.6	— 6 3 13.1	+ 4.5	Y.	
62	. .	. .	. .	+ 2 49.2	S. 44 57 48.9	55.6	— 6 5 5.7	+ 4.5	Y.	
63	. .	. .	. .	. .	. . . . .	. .	. . . .	. .	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
1875.						° ′ ″	″	″	″	″	″	″	r.	r.	r.
July 8	1	Weisse (2) XV, 237 .	6.0	3	III–VII	21 25 4.3	57.3	7.0	2.8	5.7	6.8	3.98	36.941	—0.742	36.192
	2	Anon. 15h 25m 43s .	8.0	3	III–VII	96 5 7.6	2.2	11.1	6.9	7.9	10.6	7.72	34.324	. .	33.589
	3	B. A. C. 5167 . .	6.5	3	III–VII	87 45 2.9	55.4	4.1	59.8	0.6	4.5	1.22	30.054	. .	29.317
	4	B. A. C. 5253 . .	6.0	3	III–VII	83 0 3.7	55.8	6.1	0.8	1.2	4.4	2.00	27.663	. .	26.925
	5	O. Arg. N. 15839 .	. .	3	IV–VI	348 54 60.0	51.9	66.8	57.5	61.2	61.1	59.75	31.387	. .	30.637
	6	Nadir	. .	.	. .	200 0 2.2	54.4	5.7	1.4	0.6	5.6	1.65	30.638	. .	. .
	7	Lacaille 6888. . .	6.5	3	III–VII	98 50 2.8	56.8	5.9	0.0	1.8	3.4	1.78	27.149	. .	26.415
	8	Anon. 16h 36m 33s .	6.5	3	III–VII	86 5 3.3	56.4	6.9	1.2	3.2	4.3	2.55	30.919	. .	30.182
	9	Anon. 16h 37m 10s .	8.0	3	V–IX	" " "	"	"	"	"	"	"	30.769	. .	30.035
	10	Anon. 16h 46m 38s .	6.5	3	III–VII	97 5 3.5	57.1	8.3	2.1	3.3	5.0	3.22	35.963	. .	35.229
	11	Anon. 16h 48m 30s .	8.0	3	III–VII	" " "	"	"	"	"	"	"	33.061	. .	32.327
	12	B. A. C. 5759 . .	6.0	3	IV–VI	85 15 3.1	55.8	7.2	1.8	1.7	5.0	2.43	35.912	. .	35.171
	13	B. A. C. 5833 . .	. .	3	III–VII	90 5 5.1	59.6	8.7	4.2	4.4	7.1	4.85	31.177	. .	30.441
	14	Anon. 17h 17m 5s .	9.2	3	V–IX	23 34 59.9	53.4	63.8	57.3	59.5	62.1	59.33	32.544	. .	31.784
	15	O. Arg. S. 16958 .	8.8	3	III–VII	77 0 1.9	55.5	6.8	1.0	1.2	4.0	1.73	26.290	. .	25.551
	16	Anon. 17h 34m 47s .	8.0	1	IX	82 35 5.1	57.7	8.2	3.4	3.4	5.1	3.82	25.081	. .	24.354
	17	Anon. 17h 46m 42s .	7.5	3	III–VII	21 9 59.3	52.2	63.1	57.1	59.8	60.9	58.73	32.237	. .	31.488
	18	O. Arg. S. 17503 .	. .	3	III–VII	74 30 4.7	59.4	10.9	5.8	5.6	7.3	5.62	28.904	. .	28.165
	19	Anon. 18h 5m 8s . .	8.0	3	III–VII	22 25 7.7	2.8	12.7	8.0	10.2	11.2	8.77	33.138	. .	32.389
	20	B. A. C. 6226 . .	5.5	3	III–VII	95 10 6.5	1.3	11.7	6.9	7.1	8.8	7.05	34.568	. .	33.833
	21	25 Sagittarii	6.0	3	III–VII	83 10 6.0	0.9	11.8	7.2	4.8	7.2	6.32	29.301	. .	28.563
	22	Nadir	. .	.	. .	200 0 3.4	57.5	8.3	5.4	2.3	8.6	4.25	30.734	. .	. .
12	23	26 Ophiuchi	6.5	3	III–VII	83 40 6.5	0.8	9.8	8.4	5.4	8.1	6.50	31.435	—0.720	30.719
	24	Anon. 17h 5m 31s .	9.0	3	III–VII	94 0 4.9	58.9	8.4	5.2	3.7	5.8	4.48	31.359	. .	30.646
	25	B. A. C. 5846 . .	6.5	3	III–VII	83 40 3.3	57.4	6.2	4.6	1.7	3.9	2.85	33.509	. .	32.793
	26	Lacaille 7330 . .	6.0	3	III–VII	93 0 2.8	56.9	5.7	2.9	0.4	2.4	1.85	27.420	. .	26.706
	27	Nadir	. .	.	. .	200 0 1.2	55.3	5.2	2.2	59.3	3.9	1.18	30.609	. .	. .
13	28	O. Arg. N. 15839 .	8.8	3	IV–VI	348 55 5.6	58.3	12.7	5.3	8.8	8.5	6.53	31.486	—0.555	30.923
	29	O. Arg. S. 15571 .	6.5	3	III–VII	75 35 3.3	54.5	6.1	1.1	3.2	5.2	2.23	28.895	. .	28.343
	30	α Normæ	5.0	3	III–VII	93 14 60.5	51.4	61.8	56.5	57.8	61.9	58.32	27.178	. .	26.630
	31	Lacaille 6922. . .	7.0	3	III–VII	92 20 2.0	54.4	5.1	58.9	0.4	2.8	0.60	29.127	. .	28.578
	32	Anon. 16h 37m 10s .	7.5	3	IV–VI	86 5 3.7	55.3	6.1	1.2	3.8	5.2	2.55	30.573	. .	30.023
	33	Anon. 16h 46m 38s .	7.2	3	III–VII	97 5 4.6	57.3	7.9	2.5	5.5	6.7	4.08	35.678	. .	35.131
	34	Anon. 16h 48m 31s .	8.2	3	III–VII	" " "	"	"	"	"	"	"	32.696	. .	32.149
	35	B. A. C. 5759 . .	7.0	3	III–VII	85 15 2.9	52.3	5.1	0.0	1.4	3.9	0.93	35.601	. .	35.051
	36	Nadir	. .	.	. .	200 0 4.0	55.2	6.4	2.7	2.8	7.9	3.17	30.506	. .	. .
14	37	B. A. C. 5133 . .	6.5	3	III–VII	87 25 5.4	55.8	5.9	2.9	3.3	7.3	3.43	27.600	—0.578	27.027
	38	Lacaille 6499 . .	6.8	3	III–VII	90 5 5.9	58.5	7.0	1.7	4.8	8.2	4.35	33.474	. .	32.902
	39	A Scorpii (2d *) . .	5.5	3	III–VII	83 50 2.9	54.1	3.3	59.2	1.0	3.5	0.67	32.118	. .	31.544
	40	Lacaille 6641 . .	. .	3	III–VII	95 15 5.8	57.8	8.3	3.2	4.3	6.9	4.38	32.727	. .	32.156
	41	B. A. C. 5374 . .	5.0	3	III–VII	87 55 3.6	55.1	4.5	58.9	0.9	5.7	1.45	27.261	. .	26.688
	42	B. A. C. 5429 . .	5.5	3	III–VII	87 10 6.5	58.7	8.9	5.8	6.2	9.0	5.85	31.075	. .	30.502
	43	χ Ophiuchi	. .	3	III–VII	77 5 3.2	54.8	6.2	0.2	3.7	5.9	2.33	35.037	.	34.462
	44	B. A. C. 5538 . .	4.8	3	III–VII	93 50 6.0	57.8	6.0	3.8	4.4	8.1	4.35	29.654	. .	29.083
	45	Anon. 16h 35m 14s .	9.0	1	V	89 0 3.2	56.4	5.1	0.7	3.0	6.2	2.43	28.901	. .	28.323
	46	Anon. 16h 46m 38s .	7.5	3	III–VII	97 5 6.1	0.8	9.8	4.8	6.7	8.9	6.18	35.752	. .	35.182
	47	Anon. 16h 48m 31s .	8.2	3	III–VII	" " "	"	"	"	"	"	"	32.884	. .	32.314
	48	31 Ophiuchi	7.0	3	III–VII	84 20 0.2	54.0	4.5	59.0	0.7	3.9	0.38	30.865	. .	30.292
	49	B. A. C. 5789 . .	7.0	3	III–VII	85 45 4.8	56.5	7.1	4.0	4.6	6.1	3.85	30.986	. .	30.413
	50	O. Arg. S. 16623 .	7.0	3	III–VII	85 15 7.0	0.2	11.1	7.1	7.8	10.1	7.22	27.004	. .	26.431
	51	Nadir	. .	.	. .	200 0 1.3	54.9	5.0	0.4	1.4	6.1	1.52	30.476	. .	. .
	52	Anon. 17h 39m 33s .	7.0	3	III–VII	93 5 1.9	55.6	4.8	2.3	0.8	4.1	1.58	27.743	. .	27.171
	53	Anon. 17h 46m 32s .	7.7	1	V	93 20 5.3	59.3	7.8	3.9	4.5	6.6	4.57	27.630	. .	27.052
	54	O. Arg. S. 17510 . .	8.0	2	I, IX	83 10 8.0	2.8	12.7	8.0	8.8	9.8	8.35	36.422	. .	35.866
	55	O. Arg. S. 17512 . .	8.8	3	IV–VI	" " "	"	"	"	"	"	"	37.498	. .	36.921
	56	Anon. 18h 5m 10s .	8.0	3	III–VII	22 25 0.0	54.2	4.8	58.8	2.4	4.0	0.70	32.808	. .	32.223
	57	B. A. C. 6226 . .	6.0	3	III–VII	95 10 0.2	54.9	4.2	0.1	1.3	3.1	0.63	34.059	. .	33.488
	58	Lacaille 7757. . .	7.0	3	III–VII	94 15 2.1	55.5	4.8	1.2	2.8	4.7	1.85	27.430	. .	26.859
16	59	ν¹ Scorpii	. .	1	V	78 0 4.7	56.1	6.7	0.0	4.7	7.1	3.22	31.136	—0.676	30.460
	60	ν² Scorpii	. .	2	IV, VII	" " "	"	"	"	"	"	"	29.934	. .	29.262
	61	O. Arg. S. 15566 . .	. .	3	III–VII	81 39 60.2	52.0	61.2	55.3	58.4	62.0	58.18	27.792	. .	27.120
	62	α Normæ	5.0	3	III–VII	93 15 3.8	55.6	5.0	0.0	1.7	5.8	1.98	27.399	. .	26.730
	63	B. A. C. 5567 . .	7.0	3	IV–VI	79 0 4.7	57.2	8.2	1.7	5.5	8.1	4.23	26.808	. .	26.133
	64	B. A. C. 5625 . .	7.0	3	III–VII	56 25 6.0	57.2	6.4	2.9	6.2	9.7	4.73	30.933	—0.676	30.256

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	30.256	82.0	78.5	− 3 14.1	S. 1 21 49.9	1.3	+ 37 31 47.6	+ 0.2	Y.	
2	. .	. .	. .	− 1 52.5	76 3 15.2	3 39.4	− 37 13 15.8	+ 20.4	Y.	
3	30.258	82.0	77.8	+ 21.4	67 45 22.6	2 15.0	− 28 53 58.8	+ 17.9	Y.	
4	. .	. .	. .	+ 1 36.4	S. 63 1 38.4	1 48.8	− 24 9 48.4	+ 16.2	Y.	
5	30.250	81.5	77.0	− 20.0	N. 31 5 20.2	33.6	+ 69 59 32.6	− 2.6	Y.	
6	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
7	30.250	81.2	76.4	+ 1 52.4	S. 78 51 54.2	4 34.7	− 40 2 50.1	+ 17.6	Y.	
8	. .	. .	. .	− 5.7	66 4 56.9	2 4.9	− 27 13 23.0	+ 14.5	Y.	
9	. .	. .	. .	− 1.1	66 5 1.5	2 5.0	− 27 13 27.7	+ 14.5	Y.	
10	. .	. .	. .	− 2 43.9	77 2 19.3	3 57.0	− 38 12 37.5	+ 16.0	Y.	
11	30.246	81.0	75.8	− 1 12.9	77 3 50.3	3 57.5	− 38 14 9.0	+ 15.8	Y.	
12	. .	. .	. .	− 2 42.1	65 12 20.4	2 0.1	− 26 20 41.7	+ 13.0	Y.	
13	. .	. .	. .	− 13.8	70 4 51.0	2 32.6	− 31 13 44.8	+ 13.0	Y.	
14	. .	. .	. .	− 56.1	3 34 3.2	3.5	+ 35 19 32.1	+ 2.9	Y.	
15	. .	. .	. .	+ 2 19.4	57 2 21.2	1 25.9	− 18 10 8.3	+ 9.9	Y.	
16	30.250	80.0	75.0	+ 2 57.0	62 38 0.8	1 47.5	− 23 46 9.5	+ 10.2	Y.	
17	. .	. .	. .	− 46.6	1 9 12.1	1.1	+ 37 44 25.6	+ 3.1	Y.	
18	. .	. .	. .	+ 57.5	54 31 3.1	1 18.3	− 15 38 42.6	+ 7.9	Y.	
19	. .	. .	. .	− 1 14.9	2 23 53.7	2.3	+ 36 29 42.8	+ 3.4	Y.	
20	30.240	79.2	74.0	− 2 0.1	75 8 6.9	3 27.3	− 36 17 55.4	+ 8.3	Y.	
21	. .	. .	. .	+ 45.0	63 10 51.4	1 50.2	− 24 19 2.8	+ 6.4	Y.	
22	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
23	29.936	77.8	66.8	− 22.5	63 39 44.0	1 52.9	− 24 47 58.1	+ 13.3	Y.	
24	. .	. .	. .	− 20.2	73 59 44.2	3 12.9	− 35 9 18.3	+ 14.5	Y.	
25	29.936	76.5	67.0	− 1 27.5	63 38 35.3	1 52.7	− 24 46 49.2	+ 12.0	Y.	
26	. .	. .	. .	+ 1 43.2	S. 73 1 45.1	3 1.6	− 34 11 7.9	+ 12.9	Y.	
27	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
28	29.850	80.5	79.3	− 28.9	N. 31 5 22.4	33.0	+ 69 59 34.2	− 3.3	Y.	
29	. .	. .	. .	+ 52.0	S. 55 35 54.2	1 19.8	− 16 43 35.2	+ 13.3	Y.	
30	29.862	80.3	78.3	+ 1 45.6	73 16 43.9	3 0.1	− 34 26 5.2	+ 17.3	Y.	
31	. .	. .	. .	+ 44.6	72 20 45.2	2 50.3	− 33 29 56.7	+ 16.5	Y.	
32	. .	. .	. .	− 0.7	66 5 1.8	2 3.0	− 27 13 26.0	+ 14.8	Y.	
33	. .	. .	. .	− 2 40.8	77 2 23.3	3 53.3	− 38 12 37.8	+ 16.6	Y.	
34	29.864	80.0	77.6	− 1 7.3	77 3 56.7	3 53.7	− 38 14 11.6	+ 16.4	Y.	
35	. .	. .	. .	− 2 38.3	65 12 22.6	1 58.2	− 26 20 42.0	+ 13.3	Y.	
36	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
37	29.850	81.2	79.0	+ 1 33.2	67 26 36.6	2 10.8	− 28 35 8.6	+ 18.3	Y.	
38	. .	. .	. .	− 1 30.9	70 3 33.4	2 29.6	− 31 12 24.2	+ 18.8	Y.	
39	. .	. .	. .	− 48.4	63 49 12.3	1 50.9	− 24 57 24.4	+ 16.7	Y.	
40	29.854	80.8	77.8	− 1 7.6	75 13 56.8	3 24.5	− 36 23 42.5	+ 19.4	Y.	
41	. .	. .	. .	+ 1 43.8	67 56 45.3	2 14.5	− 29 5 21.0	+ 17.1	Y.	
42	29.858	80.3	77.2	− 15.7	67 9 50.1	2 9.6	− 28 18 20.9	+ 16.5	Y.	
43	. .	. .	. .	− 2 19.9	57 2 42.5	1 24.5	− 18 10 28.2	+ 13.5	Y.	
44	. .	. .	. .	+ 28.7	73 50 33.1	3 7.0	− 35 0 1.3	+ 17.2	Y.	
45	. .	. .	. .	+ 52.6	69 0 55.0	2 22.2	− 30 9 38.4	+ 15.7	Y.	
46	. .	. .	. .	− 2 42.4	77 2 23.8	3 53.8	− 38 12 38.8	+ 16.7	Y.	
47	29.860	79.5	76.3	− 1 12.5	77 3 53.6	3 54.0	− 38 14 8.8	+ 16.5	Y.	
48	. .	. .	. .	− 9.1	64 19 51.2	1 53.9	− 25 28 6.3	+ 13.3	Y.	
49	. .	. .	. .	− 12.9	65 44 50.9	2 1.5	− 26 53 13.6	+ 13.1	Y.	
50	. .	. .	. .	+ 1 51.9	65 16 59.1	1 59.0	− 26 25 19.3	+ 12.5	Y.	
51	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
52	29.860	79.0	75.7	+ 1 28.7	73 6 30.2	2 59.1	− 34 15 50.5	+ 11.8	Y.	
53	. .	. .	. .	+ 1 32.4	73 21 36.9	3 1.9	− 34 31 0.0	+ 11.3	Y.	
54	. .	. .	. .	− 3 3.8	63 7 4.5	1 48.2	− 24 15 13.9	+ 9.1	Y.	
55	. .	. .	. .	− 3 36.9	63 6 31.5	1 48.2	− 24 14 40.9	+ 9.1	Y.	
56	. .	. .	. .	− 1 9.7	2 23 51.0	2.3	+ 36 29 45.5	+ 2.0	Y.	
57	29.854	78.8	75.0	− 1 49.3	75 8 11.3	3 24.3	− 36 17 56.8	+ 8.9	Y.	
58	29.850	78.5	74.8	+ 1 38.4	74 16 40.3	3 13.0	− 35 26 14.5	+ 8.0	Y.	
59	29.836	84.0	81.7	− 14.4	57 59 48.8	1 26.8	− 19 7 36.8	+ 14.3	Y.	
60	. .	. .	. .	+ 23.1	58 0 26.3	1 26.9	− 19 8 14.4	+ 14.3	Y.	
61	. .	. .	. .	+ 30.2	61 41 28.4	1 40.7	− 22 49 30.3	+ 14.9	Y.	
62	29.850	83.8	81.0	+ 1 42.5	73 16 44.5	2 59.1	− 34 26 4.8	+ 17.4	Y.	
63	. .	. .	. .	+ 2 1.2	59 2 5.4	1 30.6	+ 20 9 57.2	+ 13.4	Y.	
64	. .	. .	. .	− 8.0	S. 36 24 56.7	40.2	+ 2 28 1.9	+ 7.6	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. July 16	1	Anon. $16^h 48^m 46^s$	8.0	3	III–VII	95 50 7.4	1.1	11.2	4.8	8.1	11.0	7.27	32.147	−0.676	31.478
	2	Nadir	. .	.	. . .	200 0 2.8	54.6	5.9	0.6	3.2	8.1	2.53	30.681	. .	. .
	3	O. Arg. S. 16958	8.8	3	III–VII	77 0 3.6	53.9	5.7	58.8	3.3	5.0	1.72	26.279	. .	25.606
	4	O. Arg. S. 17094	8.8	3	III–VII	82 35 4.5	55.7	6.8	0.3	3.6	5.0	2.65	35.918	. .	35.246
	5	Anon. $17^h 45^m 18^s$	8.0	3	III–VII	93 40 4.2	56.8	7.0	2.6	4.9	6.8	3.72	29.364	. .	28.695
	6	Anon. $17^h 46^m 11^s$	7.5	2	VII, IX	“ “ “	“	“	“	“	“	“	27.598	−0.676	26.940
	7	O. Arg. S. 17510	7.5	2	I, IX	83 10 8.1	0.3	11.2	4.4	7.7	9.1	6.80	36.472	−0.640	35.854
	8	O. Arg. S. 17512	8.5	3	IV–VI	“ “ “	“	“	“	“	“	“	37.494	. .	36.855
	9	Lalande 33472	6.0	3	III–VII	22 29 61.2	52.8	64.0	55.3	62.3	63.0	59.77	36.255	. .	35.608
	10	B. A. C. 6220	6.0	3	III–VII	87 20 5.5	57.2	7.8	2.0	5.5	8.2	4.37	29.538	. .	28.903
	11	Anon. $18^h 22^m 37^s$	8.0	3	IV–VI	22 55 3.9	57.3	7.0	59.5	4.8	7.9	3.40	33.353	. .	32.711
	12	Anon. $18^h 22^m 48^s$	8.0	2	I, IX	“ “ “	“	“	“	“	“	“	28.230	. .	27.555
	13	Lacaille 7815	7.0	3	III–VII	92 50 2.0	54.2	3.5	59.4	0.5	3.2	0.47	32.798	. .	32.164
	14	Lacaille 7846	5.5	3	IV–VI	99 20 4.2	58.2	7.2	2.2	3.5	6.1	3.57	28.380	. .	27.743
	15	Anon. $18^h 47^m 51^s$	7.2	3	III–VII	92 15 3.1	56.7	6.3	59.8	1.8	4.1	1.97	29.273	−0.640	28.639
	16	B. A. C. 6490	6.0	3	III–VII	83 55 4.9	57.7	8.2	2.2	5.1	7.2	4.22	34.909	−0.605	34.309
	17	Lalande 36002	7.5	3	III–VII	20 35 4.1	57.4	8.7	2.7	6.9	7.5	4.55	30.685	. .	30.072
	18	Nadir	. .	.	. . .	199 59 56.3	47.3	59.2	52.9	55.2	60.0	55.15	30.301	. .	. .
17	19	B. A. C. 5430	6.5	3	III–VII	86 34 55.1	47.0	57.2	53.7	53.6	58.2	54.13	29.111	−0.674	28.442
	20	α Normæ	. .	3	III–VII	93 15 4.0	56.8	6.8	2.0	2.7	7.2	3.25	27.443	. .	26.776
	21	O. Arg. S. 15847	8.8	3	III–VII	83 25 5.9	58.8	7.8	3.7	3.7	7.7	4.60	27.665	. .	26.995
	22	B. A. C. 5718	5.5	3	III–VII	90 49 59.8	52.0	62.2	55.2	57.7	60.1	57.83	33.252	. .	32.584
	23	B. A. C. 5768	. .	3	III–VII	89 5 3.3	57.1	7.1	1.4	1.7	5.9	2.75	29.556	. .	28.888
	24	B. A. C. 5820	. .	3	III–VII	88 55 3.7	56.8	7.1	1.0	3.2	6.3	3.02	34.743	. .	34.075
	25	*d* Ophiuchi	. .	3	III–VII	88 35 3.2	54.9	5.1	59.0	0.6	4.2	1.17	27.548	. .	26.879
	26	52 Ophiuchi	. .	3	III–VII	80 50 0.8	53.2	4.6	58.2	0.3	3.2	0.05	31.387	. .	30.717
	27	ι Herculis	. .	3	III–VII	12 50 2.8	56.3	6.9	1.1	3.9	5.9	2.82	32.038	. .	31.354
	28	Anon. $17^h 46^m 42^s$	. .	3	III–VII	21 9 59.4	51.3	61.9	58.0	60.8	62.1	58.92	32.293	. .	31.612
	29	Nadir	. .	.	. .	199 59 60.0	52.2	63.1	57.7	58.7	64.1	59.30	30.502	. .	. .
Aug. 21	30	Anon. $17^h 44^m 10^s$	8.5	1	V	93 40 4.7	56.2	5.9	5.2	4.7	5.9	3.77	31.580	−0.584	30.996
	31	Anon. $17^h 45^m 28^s$	8.0	3	III–VII	“ “ “	“	“	“	“	“	“	31.405	. .	30.828
	32	Anon. $17^h 46^m 32^s$	8.5	2	VII, IX	“ “ “	“	“	“	“	“	“	27.539	. .	26.972
	33	Anon. $17^h 57^m 35^s$	8.2	3	III–VII	96 14 60.0	53.7	63.0	58.0	60.1	62.0	59.47	27.776	. .	27.199
	34	Anon. $18\ 5^h\ ^m\ 31^s$	6.5	3	III–VII	20 25 4.2	57.8	7.7	3.8	7.2	6.4	4.52	27.878	. .	27.286
	35	Anon. $18^h 16^m 34^s$	8.5	3	V–IX	88 25 1.7	54.7	3.0	0.0	0.2	3.3	0.48	27.372	. .	26.796
	36	25 Sagittarii	6.5	3	III–VII	83 10 3.1	55.5	5.7	3.0	1.7	4.0	2.17	29.039	. .	28.459
	37	Lacaille 7846	. .	3	III–VII	99 20 4.5	57.2	6.5	2.9	3.6	5.0	3.28	28.324	. .	27.748
	38	Anon. $18^h 48^m 48^s$	7.0	3	III–VII	92 20 5.3	58.0	7.1	5.3	3.9	5.6	4.20	30.407	. .	29.829
	39	Lalande 35499	. .	3	III–VII	78 10 5.8	58.9	9.6	6.8	7.4	8.3	6.13	32.527	. .	31.946
	40	Anon. $19^h 6^m 49^s$	7.5	3	III–VII	88 20 4.7	57.8	6.7	4.1	2.5	6.1	3.65	33.346	. .	32.767
	41	Nadir	. .	.	. .	200 0 3.9	57.2	7.2	3.9	3.2	6.5	3.65	30.551	. .	. .
	42	Anon. $19^h 41^m 26^s$	6.0	3	V–IX	87 55 1.9	54.0	3.0	0.3	0.1	2.2	0.25	26.729	. .	26.152
	43	O. Arg. S. 20156	. .	3	III–VII	87 10 4.8	58.7	8.2	6.0	4.5	6.3	4.75	27.200	. .	26.621
	44	B. A. C. 2749, S.P.	. .	3	IV–VI	311 44 59.9	51.7	64.3	57.7	59.8	59.9	58.88	33.428	. .	32.854
	45	B. A. C. 7025	. .	3	III–VII	96 40 6.1	2.2	11.9	9.2	7.2	9.1	7.62	34.491	. .	33.914
	46	B. A. C. 7087	6.5	3	III–VII	73 0 6.1	0.8	9.9	7.6	6.6	8.0	6.50	28.392	. .	27.810
	47	B. A. C. 2930, S. P.	. .	3	IV–VI	319 25 3.7	57.7	10.0	2.8	5.0	5.4	4.10	31.005	. .	30.437
25	48	7 Sagittarii	. .	3	III–VII	83 9 60.4	54.3	62.6	60.5	60.0	60.2	59.67	33.101	−0.581	32.524
	49	Lalande 33472	6.5	3	III–VII	22 30 6.2	2.8	9.7	8.8	9.7	9.2	7.73	36.609	. .	36.021
	50	B. A. C. 6210	6.5	3	V–IX	74 45 4.9	1.4	8.9	8.9	8.2	8.0	6.72	30.341	. .	29.762
	51	B. A. C. 6283	7.8	3	III–VII	87 45 4.7	58.9	6.8	4.4	5.7	6.1	4.43	32.637	. .	32.061
	52	Lacaille 7815	. .	3	III–VII	92 50 1.7	56.8	3.5	3.1	1.8	2.8	1.62	32.796	. .	32.221
	53	Lacaille 7858	6.5	3	III–VII	96 0 3.2	59.5	8.2	6.2	6.3	5.9	4.88	32.937	. .	32.363
	54	B. A. C. 6474	7.5	3	III–VII	87 5 1.1	55.2	3.9	3.6	2.3	3.0	1.52	31.262	. .	30.686
	55	α Coronæ Australis	. .	3	III–VII	96 55 2.7	59.1	6.8	5.1	4.2	4.9	3.80	29.564	. .	28.991
	56	*d* Sagittarii	5.0	3	V–IX	78 5 3.9	0.4	8.2	7.9	6.2	6.8	5.57	35.431	. .	34.853
	57	Lalande 36557	7.5	3	IV–VI	74 10 2.6	58.5	6.2	6.6	4.8	4.2	3.82	33.959	. .	33.379
	58	B. A. C. 6643	6.0	3	V–IX	“ “ “	“	“	“	“	“	“	30.196	. .	29.617
	59	Nadir	. .	.	. .	200 0 5.3	0.4	9.2	9.2	6.8	8.8	6.62	30.642	. .	. .
	60	B. A. C. 6814	6.0	3	III–VII	83 5 3.8	59.7	7.2	7.0	5.7	5.2	4.77	27.336	. .	26.759
	61	O. Arg. S. 20156	. .	3	III–VII	87 10 4.2	59.8	8.1	8.0	6.2	6.1	5.40	27.292	. .	26 716
	62	B. A. C. 2749, S. P.	. .	3	IV–VI	311 45 3.8	58.1	8.1	3.7	4.8	3.0	3.58	33.601	. .	33.030
	63	B. A. C. 6992	6.5	3	III–VII	74 5 4.3	0.6	9.6	9.3	7.3	6.7	6.30	34.818	. .	34.240
	64	β Capricorni	4.5	2	VII, IX	“ “ “	“	“	“	“	“	“	35.110	. .	34.533
	65	B. A. C. 7087	6.5	3	III–VII	73 0 1.9	58.8	5.8	6.4	3.3	3.2	3.23	28.302	. .	27.723
	66	B. A. C. 2930, S. P.	. .	3	IV–VI	319 25 4.1	59.3	10.0	5.5	5.3	5.2	4.90	31.058	−0.581	30.493

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	29.850	83.3	80.4	− 46.3	S. 75 49 21.0	3 32.0	− 36 59 14.2	+ 16.4	Y.	
2	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
3	. .	. .	. .	+ 2 17.7	57 2 19.4	1 24.0	− 18 10 4.6	+ 10.0	Y.	
4	29.848	83.0	79.3	− 2 44.4	62 32 18.2	1 44.8	− 23 40 24.2	+ 10.5	Y.	
5	. .	. .	. .	+ 40.9	73 40 44.6	3 4.2	− 34 50 10.0	+ 11.6	Y.	
6	. .	. .	. .	+ 1 35.9	73 41 39.6	3 4.5	− 34 51 5.3	+ 11.5	Y.	
7	. .	. .	. .	− 3 3.5	63 7 3.3	1 47.5	− 24 15 12.0	+ 9.2	Y.	
8	29.850	82.7	78.4	− 3 34.8	63 6 32.0	1 47.5	− 24 14 40.7	+ 9.2	Y.	
9	. .	. .	. .	− 2 55.8	2 27 4.0	2.3	+ 36 26 32.5	+ 1.5	Y.	
10	. .	. .	. .	+ 34.4	67 20 38.7	2 10.4	− 28 29 10.3	+ 8.2	Y.	
11	. .	. .	. .	− 1 25.0	2 53 38.4	2.8	+ 35 59 57.6	+ 1.6	Y.	
12	. .	. .	. .	+ 1 16.7	2 56 20.1	2.8	+ 35 57 15.9	+ 1.6	Y.	
13	. .	. .	. .	− 1 7.8	72 48 52.7	2 55.1	− 33 58 9.0	+ 7.2	Y.	
14	29.844	82.2	77.6	+ 1 10.6	79 21 14.2	4 42.3	− 40 32 17.7	+ 7.2	Y.	
15	. .	. .	. .	+ 42.7	72 15 44.6	2 49.5	− 33 24 55.3	+ 5.7	Y.	
16	29.850	82.0	77.8	− 2 15.1	63 52 49.2	1 51.3	− 25 1 1.7	+ 4.4	Y.	
17	. .	. .	. .	− 2.2	0 35 2.3	0.6	+ 38 18 35.9	+ 1.6	Y.	
18	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
19	29.905	82.2	78.7	+ 48.9	66 35 43.0	2 5.9	− 27 44 10.1	+ 16.4	Y.	
20	. .	. .	. .	+ 1 41.1	73 16 44.3	3 0.3	− 34 26 5.8	+ 17.5	Y.	
21	29.894	81.6	78.0	+ 1 34.1	63 26 38.8	1 49.3	− 24 34 49.3	+ 14.4	Y.	
22	. .	. .	. .	− 1 21.0	70 48 36.8	2 36.2	− 31 57 34.2	+ 15.0	Y.	
23	. .	. .	. .	+ 34.8	69 5 37.6	2 22.6	− 30 14 21.4	+ 14.1	Y.	
24	29.882	81.0	77.7	− 2 7.7	68 52 55.3	2 21.0	− 30 1 37.5	+ 13.5	Y.	
25	. .	. .	. .	+ 1 37.8	68 36 39.0	2 19.1	− 29 45 19.3	+ 12.8	Y.	
26	. .	. .	. .	− 22.5	S. 60 49 37.6	1 38.1	− 21 57 36.9	+ 10.7	Y.	
27	. .	. .	. .	− 42.4	N. 7 10 39.6	6.9	+ 46 4 25.3	+ 0.2	Y.	
28	29.904	80.5	76.3	− 50.5	S. 1 9 8.4	1.1	+ 37 44 29.3	+ 1.0	Y.	
29	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
30	. .	. .	. .	− 31.2	73 39 32.6	3 8.7	− 34 49 2.5	+ 13.9	Y.	
31	. .	. .	. .	− 25.9	73 39 37.8	3 8.7	− 34 49 7.7	+ 13.8	Y.	
32	30.180	76.5	71.8	+ 1 34.9	73 41 38.8	3 9.1	− 34 51 9.1	+ 13.8	Y.	
33	. .	. .	. .	+ 1 27.8	76 16 27.2	3 45.2	− 37 26 33.6	+ 13.7	Y.	
34	. .	. .	. .	+ 1 25.1	0 26 29.6	0.4	+ 38 27 8.8	− 6.2	Y.	
35	30.178	76.2	70.7	+ 1 40.4	68 26 40.9	2 21.2	− 29 35 23.3	+ 9.9	Y.	
36	. .	. .	. .	+ 48.3	63 10 50.4	1 50.7	− 24 19 2.3	+ 7.5	Y.	
37	30.180	75.5	70.0	+ 1 10.6	79 21 13.8	4 49.8	− 40 32 24.8	+ 10.9	Y.	
38	. .	. .	. .	+ 5.3	72 20 9.5	2 54.8	− 33 29 25.5	+ 8.2	Y.	
39	. .	. .	. .	− 1 1.0	58 9 5.1	1 30.4	− 19 16 56.7	+ 3.9	Y.	
40	. .	. .	69.0	− 1 26.7	68 18 36.9	2 20.7	− 29 27 18.8	+ 5.4	Y.	
41	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
42	30.178	74.3	68.1	+ 2 0.6	67 57 0.8	2 18.4	− 29 5 40.4	+ 2 0	Y.	
43	. .	. .	. .	+ 1 45.9	S. 67 11 50.7	2 13.5	− 28 20 25.4	+ 0.6	Y.	
44	30.180	74.0	67.7	− 1 29.4	N. 68 16 30.6	2 20.8	+ 72 47 29.8	+ 4.0	Y.	
45	. .	. .	. .	− 2 2.7	S. 76 38 5.0	3 53.1	− 37 48 19.3	− 0.3	Y.	
46	. .	. .	. .	+ 1 8.6	S. 53 1 15.1	1 15.0	− 14 8 51.3	− 4.9	Y.	
47	30.180	73.2	67.0	− 13.7	N. 70 35 9.6	2 39.1	+ 80 28 32.5	+ 4.8	Y.	
48	30.242	71.2	65.8	− 1 19.1	S. 63 8 40.5	1 51.8	− 24 16 53.5	+ 10.0	Y.	
49	. .	. .	. .	− 3 8.7	2 26 59.0	2.4	+ 36 26 37.4	− 6.4	Y.	
50	30.240	70.8	65.3	+ 7.5	54 45 14.2	1 20.4	− 15 52 55.8	+ 6.1	Y.	
51	. .	. .	. .	− 1 4.6	67 43 59.8	2 18.1	− 28 52 39.1	+ 9.4	Y.	
52	. .	. .	. .	− 1 9.6	72 48 52.0	3 1.8	− 33 58 15.0	+ 10.2	Y.	
53	30.234	70.2	65.0	− 1 14.1	75 58 50.8	3 43.8	− 37 8 55.8	+ 10.3	Y.	
54	. .	. .	. .	− 21.5	67 4 40.0	2 13.8	− 28 13 15.0	+ 6.7	Y.	
55	30.230	70.0	64.7	+ 31.6	76 55 35.4	4 0.1	− 38 5 56.7	+ 8.5	Y.	
56	. .	. .	. .	− 2 32.1	58 2 33.4	1 31.1	− 19 10 25.7	+ 2.7	Y.	
57	. .	. .	. .	− 1 45.9	54 8 17.9	1 18.8	− 15 15 57.9	+ 1.1	Y.	
58	30.230	69.5	63.7	+ 12.0	54 10 15.8	1 18.9	− 15 17 55.9	+ 1.0	Y.	
59	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
60	30.226	69.0	62.8	+ 1 41.6	63 6 46.4	1 52.3	− 24 14 59.9	+ 0.7	Y.	
61	. .	. .	. .	+ 1 42.9	S. 67 11 48.3	2 15.1	− 28 20 24.6	+ 0.8	Y.	
62	30.222	68.5	62.2	− 1 35.0	N. 68 16 31.4	2 22.6	+ 72 47 26.9	+ 5.1	Y.	
63	. .	. .	. .	− 2 12.9	S. 54 2 53.4	1 18.8	− 15 10 33.4	− 3.6	Y.	
64	. .	. .	. .	− 2 22.1	54 2 44.2	1 18.8	− 15 10 24.2	− 3.6	Y.	
65	. .	. .	. .	+ 1 11.4	S. 53 1 14.6	1 15.9	− 14 8 51.7	− 4.9	Y.	
66	30.218	67.5	61.8	− 15.4	N. 70 35 10.5	2 41.0	+ 80 28 29.7	+ 6.1	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
1875.						° ′ ″	″	″	″	″	″	″	r.	r.	r.
Aug. 30	1	B. A. C. 6076	. .	3	III-VII	92 15 3.6	54.2	2.9	59.0	3.1	5.1	1.32	31.293	−0.779	30.520
	2	B. A. C. 6131	. .	3	III-VII	90 0 2.9	55.2	2.9	56.9	3.8	4.5	1.03	27.384	. .	26.611
	3	Lalande 33602	7.5	3	III-VII	23 44 60.8	54.1	61.3	55.3	63.4	63.3	59.70	33.310	. .	32.524
	4	21 Sagittarii	5.5	3	III-VII	79 30 3.6	56.3	4.8	59.7	6.7	6.0	2.85	33.555	. .	32.780
	5	B. A. C. 6321	6.5	3	III-VII	88 40 5.9	0.6	6.2	2.0	8.8	9.6	5.52	32.473	. .	31.700
	6	λ Coronæ Australis	5.5	3	III-VII	97 15 6.4	0.0	7.9	2.3	9.3	9.3	5.87	28.482	. .	27.711
	7	B. A. C. 6414	. .	3	III-VII	89 45 4.8	57.9	4.9	1.0	6.2	6.7	3.58	32.576	. .	31.803
	8	B. A. C. 6474	7.5	3	III-VII	87 5 8.4	1.1	10.2	6.0	11.2	12.2	8.18	31.581	. .	30.807
	9	Lacaille 8008	6.5	3	III-VII	95 10 4.2	57.4	6.7	1.4	7.9	7.1	4.12	27.129	. .	26.357
	10	B. A. C. 6576	6.0	3	III-VII	83 15 3.4	56.3	4.2	0.9	5.2	5.3	2.55	30.279	. .	29.504
	11	ν Sagittarii	5.5	3	III-VII	75 5 4.3	56.3	6.2	1.9	6.7	7.1	3.75	33.569	. .	32.793
	12	Lacaille 8120	6.5	3	III-VII	91 10 2.2	54.8	3.8	58.8	4.6	4.6	1.47	27.387	. .	26.614
	13	Lacaille 8169	7.0	3	III-VII	92 4 60.0	52.5	61.0	60.2	61.4	61.0	59.35	35.980	. .	35.207
	14	O. Arg. S. 19933	8.0	3	III-VII	86 25 7.9	1.2	9.9	8.8	10.7	11.1	8.27	29.786	. .	29.012
	15	*b* Sagittarii	. .	3	III-VII	86 20 4.2	57.2	6.5	2.8	6.2	7.3	4.03	27.982	. .	27.208
	16	Anon. $19^h 56^m 41^s$	6.5	3	V-IX	22 10 2.1	55.2	4.1	59.3	5.4	5.4	1.92	34.056	. .	33.257
	17	18 Vulpeculæ	6.0	3	III-VII	32 19 58.0	51.1	58.4	54.0	60.5	60.3	57.05	28.429	. .	27.645
	18	Lacaille 8406	. .	3	III-VII	94 55 3.9	57.9	6.3	1.8	6.7	6.1	3.78	32.360	. .	31.588
	19	ρ Capricorni	5.0	3	III-VII	77 5 5.6	58.1	6.9	3.3	8.9	7.3	5.02	29.666	. .	28.890
	20	B. A. C. 7114	6.0	3	III-VII	18 15 0.3	53.6	3.8	57.4	3.8	3.9	0.47	33.938	. .	33.151
	21	B. A. C. 7187	7.0	3	III-VII	85 45 3.3	55.2	5.7	2.7	6.2	5.8	3.15	33.238	. .	32.464
	22	Nadir	. .	.	. .	200 0 3.6	56.2	4.3	2.2	4.8	8.1	3.20	30.732	. .	. .
31	23	B. A. C. 6907	7.0	3	III-VII	74 14 59.8	52.1	60.6	55.9	61.2	62.3	58.65	29.578	−0.755	28.826
	24	Lacaille 8406	. .	3	III-VII	94 55 4.0	57.2	5.7	2.3	5.7	6.9	3.65	32.354	. .	31.606
	25	B. A. C. 7021	. .	3	III-VII	85 50 3.2	56.2	4.5	2.1	5.2	5.9	2.85	32.242	. .	31.492
	26	B. A. C. 7114	. .	3	IV-VI	18 15 1.1	53.8	2.8	58.5	3.4	4.4	0.67	33.893	. .	33.135
	27	B. A. C. 7187	. .	3	III-VII	85 45 6.8	59.1	8.2	7.0	9.8	9.1	6.67	33.283	. .	32.533
	28	B. A. C. 7263	5.5	3	III-VII	75 25 6.3	59.2	9.7	7.0	8.9	9.4	6.75	35.059	. .	34.307
	29	A Capricorni	5.0	3	III-VII	84 20 2.4	54.9	4.1	0.9	4.1	4.8	1.87	27.227	. .	26.477
	30	Lacaille 8736	7.0	3	III-VII	89 0 3.5	56.9	5.1	0.6	5.2	6.7	3.00	27.585	. .	26.836
	31	1 Pegasi	. .	3	III-VII	39 35 1.1	53.7	2.7	58.8	4.8	6.4	1.25	27.220	. .	26.462
	32	2 Pegasi	. .	3	III-VII	35 50 2.2	53.1	2.9	58.8	4.2	5.1	1.05	35.235	. .	34.476
	33	*d* Aquarii	. .	3	III-VII	57 10 oblit.	1.0	9.0	7.7	11.8	12.7	8.25	27.634	. .	26.879
	34	λ Capricorni	. .	3	III-VII	70 49 61.3	52.8	61.3	59.4	61.2	63.9	59.98	33.065	. .	32.312
	35	γ Gruis	. .	3	III-VII	96 45 7.7	4.4	12.6	7.2	11.8	12.1	9.30	27.784	. .	27.036
	36	18 Pegasi	6.0	3	III-VII	52 45 8.3	0.4	10.0	7.2	10.8	12.0	8.12	29.728	. .	28.972
	37	B. A. C. 7697	7.0	3	III-VII	69 55 3.0	57.9	5.3	4.3	7.1	7.6	4.20	29.586	. .	28.833
	38	Nadir	. .	.	. .	200 0 5.0	57.7	6.7	4.1	6.6	9.4	4.92	30.766	. .	. .
Sept. 2	39	B. A. C. 6076	6.5	3	III-VII	92 15 3.9	56.1	5.0	0.3	4.1	6.7	2.68	31.124	−0.656	30.474
	40	B. A. C. 6131	. .	3	III-VII	90 0 5.3	57.1	5.4	2.1	5.2	7.8	3.82	27.275	. .	26.625
	41	B. A. C. 6187	6.0	3	III-VII	86 35 2.8	52.2	2.8	59.3	2.8	6.0	0.98	27.204	. .	26.553
	42	B. A. C. 6244	6.5	3	III-VII	90 40 3.9	55.1	3.8	0.8	3.8	5.1	2.08	29.761	. .	29.111
	43	B. A. C. 6321	. .	3	III-VII	88 40 6.8	59.8	7.7	3.8	8.2	10.4	6.12	32.333	. .	31.683
	44	λ Coronæ Borealis	5.0	3	V-IX	97 15 5.7	58.3	7.2	2.8	7.3	8.4	4.95	28.235	. .	27.592
	45	Lacaille 7858	7.0	3	III-VII	96 0 5.2	58.3	7.2	3.6	7.7	9.3	5.22	32.779	. .	32.130
	46	33 Sagittarii	5.5	3	III-VII	80 25 1.8	55.1	2.3	59.4	3.7	5.1	1.23	34.948	. .	34.296
	47	12 Aquilæ	. .	2	VII, IX	64 49 60.0	48.1	60.0	55.0	59.8	62.0	57.48	35.335	. .	34.677
	48	B. A. C. 6546	7.0	3	V-IX	86 10 2.8	54.9	3.9	1.5	4.7	5.5	2.22	30.103	. .	29.454
	49	ν Sagittarii	5.5	3	III-VII	75 5 4.2	55.8	5.8	2.2	6.2	7.7	3.65	33.409	. .	32.756
	50	B. A. C. 6043	5.8	3	III-VII	74 10 4.7	54.2	5.8	1.8	5.6	6.5	3.10	30.131	. .	29.478
	51	Lacaille 8169	. .	3	III-VII	92 5 6.0	58.9	6.8	5.2	7.1	8.3	5.38	36.045	. .	35.395
	52	O. Arg. S. 19933	7.0	3	III-VII	86 25 5.8	57.7	6.4	4.3	6.6	8.6	4.90	29.479	. .	28.828
	53	*b* Sagittarii	. .	3	III-VII	86 20 4.6	56.3	6.2	3.4	6.2	8.1	4.13	27.861	. .	27.210
	54	Lacaille 8309	. .	3	III-VII	98 0 3.5	55.9	4.0	59.8	4.2	6.0	2.23	28.224	. .	27.576
	55	18 Vulpeculæ	. .	3	III-VII	32 20 4.5	55.5	4.5	59.8	6.7	7.3	3.05	28.527	. .	27.866
	56	B. A. C. 6992	7.0	3	III-VII	74 5 5.0	57.2	6.9	2.8	7.2	8.3	4.57	34.703	. .	34.050
	57	B. A. C. 7044	6.5	3	III-VII	77 10 5.9	57.2	6.7	2.6	7.2	8.9	4.75	32.303	. .	31.650
	58	Lacaille 8513	7.5	3	V-IX	95 5 5.4	57.4	6.9	2.6	6.6	7.9	4.47	32.028	. .	31.383
	59	B. A. C. 7187	. .	3	III-VII	85 45 5.4	56.7	7.3	4.0	7.8	8.8	5.00	33.094	. .	32.443
	60	B. A. C. 7252	6.0	3	III-VII	85 40 3.0	55.4	4.9	0.8	4.7	6.0	2.47	34.920	. .	34.269
	61	δ Microscopii	5.5	3	III-VII	89 30 4.4	57.6	5.9	1.5	5.7	7.6	3.78	34.010	. .	33.360
	62	Nadir	. .	.	. .	199 59 60.6	50.8	61.0	55.4	60.4	64.5	58.78	30.468	. .	. .
4	63	30 Draconis	. .	3	III-VII	8 5 8.1	59.4	9.8	4.3	10.7	10.0	7.05	30.984	−0.780	30.192
	64	7 Sagittarii	. .	3	III-VII	83 10 3.4	55.2	4.1	58.9	3.7	5.8	1.85	33.171	. .	32.395
	65	Lacaille 7629	6.5	3	III-VII	93 30 6.1	57.3	4.9	3.0	6.8	8.4	4.42	33.646	−0.780	32.873

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	′ ″		
1	29.952	78.0	73.2	− 16.3	S. 72 14 45.0	2 51.3	− 33 23 57.5	+ 13.2	Y.	
2	. .	. .	. .	+ 1 46.2	70 1 47.2	2 31.5	− 31 10 39.9	+ 11.8	Y.	
3	. .	. .	. .	− 1 19.1	3 43 40.6	3.6	+ 35 9 54.6	− 7.0	Y.	
4	29.950	77.3	72.2	− 1 27.1	59 28 35.7	1 34.0	− 20 36 30.9	+ 7.2	Y.	
5	. .	. .	. .	− 53.3	68 39 12.2	2 21.3	− 29 47 54.7	+ 9.3	Y.	
6	. .	. .	. .	+ 1 11.7	77 16 17.6	4 0.9	− 38 26 39.7	+ 11.3	Y.	
7	. .	. .	. .	− 56.5	69 44 7.1	2 29.6	− 30 52 57.9	+ 8.2	Y.	
8	29.960	76.5	70.8	− 25.3	67 4 42.9	2 11.0	− 28 13 15.1	+ 6.8	Y.	
9	. .	. .	. .	+ 1 54.2	75 11 58.3	3 27.6	− 36 21 47.1	+ 8.3	Y.	
10	. .	. .	. .	+ 15.5	63 15 18.1	1 50.2	− 24 23 29.5	+ 4.3	Y.	
11	. .	. .	70.4	− 1 27.5	55 3 36.2	1 19.7	− 16 11 17.1	+ 1.5	Y.	
12	. .	. .	. .	+ 1 46.1	71 11 47.6	2 42.3	− 32 20 51.1	+ 5.2	Y.	
13	29.956	75.8	70.0	− 2 43.2	72 2 16.2	2 50.3	− 33 11 27.7	+ 4.7	Y.	
14	. .	. .	. .	+ 31.0	66 25 39.2	2 7.3	− 27 34 7.7	+ 2.4	Y.	
15	. .	. .	. .	+ 1 27.5	66 21 31.5	2 6.9	− 27 29 59.6	+ 1.4	Y.	
16	. .	. .	. .	− 1 42.1	2 8 19.8	2.1	+ 36 45 16.9	− 10.6	Y.	
17	. .	. .	. .	+ 1 13.8	12 21 10.9	12.2	+ 26 32 15.7	− 10.0	Y.	
18	29.958	75.0	69.6	− 49.8	74 54 14.0	3 23.9	− 36 3 59.1	+ 0.9	Y.	
19	. .	. .	. .	+ 34.8	S. 57 5 39.8	1 26.2	− 18 13 27.2	− 3.7	Y.	
20	. .	. .	. .	− 1 38.7	N. 1 46 38.3	1.7	+ 40 40 18.8	− 11.6	Y.	
21	29.964	74.7	69.2	− 1 17.2	S. 65 43 45.9	2 3.4	− 26 52 10.5	− 3.8	Y.	
22	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
23	30.080	76.0	72.7	+ 36.8	54 15 35.4	1 17.4	− 15 23 14.0	− 2.6	Y.	
24	. .	. .	. .	− 50.3	74 54 13.3	3 23.6	− 36 3 58.1	+ 1.0	Y.	
25	. .	. .	. .	− 46.8	S. 65 49 16.1	2 3.6	− 26 57 40.9	− 1.6	Y.	
26	. .	. .	. .	− 1 38.2	N. 1 46 37.6	1.7	+ 40 40 18.1	− 11.9	Y.	
27	30.080	76.0	72.2	− 1 19.4	S. 65 43 47.3	2 3.2	− 26 52 11.7	− 3.8	Y.	
28	. .	. .	. .	− 2 15.0	55 22 51.8	1 20.8	− 16 30 33.8	− 6.7	Y.	
29	. .	. .	. .	+ 1 50.4	64 21 52.3	1 55.9	− 25 30 9.4	− 6.0	Y.	
30	. .	. .	. .	+ 1 39.1	69 1 42.2	2 24.7	− 30 10 28.1	− 6.0	Y.	
31	. .	. .	. .	+ 1 50.9	19 36 52.2	19.9	+ 19 16 26.7	− 12.3	Y.	
32	30.082	75.5	71.5	− 2 20.3	15 47 40.8	15.8	+ 23 5 42.2	− 12.8	Y.	
33	. .	. .	. .	+ 1 37.8	37 11 46.1	42.4	+ 1 41 10.3	− 12.1	Y.	+ 0″.87 applied to mean of B, C, D, and E.
34	. .	. .	. .	− 1 12.5	50 48 47.5	1 8.5	− 11 56 17.2	− 11.5	Y.	
35	. .	. .	71.5	+ 1 32.9	76 46 42.2	3 53.2	− 37 56 56.6	− 9.2	Y.	
36	. .	. .	. .	+ 32.2	32 45 40.3	36.0	+ 6 7 22.5	− 13.6	Y.	
37	30.090	75.2	71.4	+ 36.6	49 55 40.8	1 6.4	− 11 3 8.4	− 13.2	Y.	
38	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
39	29.992	80.0	79.4	− 14.8	72 14 47.8	2 49.6	− 33 23 58.6	+ 13.2	Y.	
40	. .	. .	. .	+ 1 45.8	70 1 49.6	2 29.9	− 31 10 40.7	+ 11.9	Y.	
41	. .	. .	. .	+ 1 48.0	66 36 49.0	2 6.4	− 27 45 16.6	+ 10.1	Y.	
42	29.996	80.0	78.7	+ 27.8	70 40 29.9	2 35.4	− 31 49 26.5	+ 10.8	Y.	
43	. .	. .	. .	− 52.8	68 39 13.4	2 19.8	− 29 47 54.4	+ 9.4	Y.	
44	. .	. .	. .	+ 1 15.5	77 16 20.4	3 58.2	− 38 26 39.8	+ 11.5	Y.	
45	. .	. .	. .	− 1 6.8	75 58 58.5	3 36.6	− 37 8 56.3	+ 10.7	Y.	
46	30.004	79.7	77.6	− 2 14.7	60 22 46.6	1 36.7	− 21 30 44.5	+ 5.3	Y.	
47	. .	. .	. .	− 2 26.6	44 47 30.9	54.7	− 5 54 46.8	+ 0.1	Y.	
48	. .	. .	. .	+ 17.1	66 10 19.3	2 4.2	− 27 18 44.7	+ 5.8	Y.	
49	. .	. .	. .	− 1 26.4	55 3 37.3	1 18.9	− 16 11 17.4	+ 1.5	Y.	
50	. .	. .	. .	+ 16.3	54 10 19.4	1 16.4	− 15 17 57.0	+ 0.9	Y.	
51	30.000	79.5	76.5	− 2 49.1	72 2 16.3	2 48.5	− 33 11 26.0	+ 4.9	Y.	
52	. .	. .	. .	+ 36.7	66 25 41.6	2 5.9	− 27 34 8.7	+ 2.6	Y.	
53	. .	. .	. .	+ 1 27.4	66 21 31.6	2 5.6	− 27 29 58.4	+ 1.5	Y.	
54	29.996	79.0	75.8	+ 1 16.0	78 1 18.2	4 14.1	− 39 11 53.5	+ 3.8	Y.	
55	. .	. .	. .	+ 1 6.9	12 21 9.9	12.1	+ 26 32 16.8	− 10.6	Y.	
56	. .	. .	. .	− 2 6.9	54 2 57.7	1 16.2	− 15 10 35.1	− 3.7	Y.	
57	. .	. .	. .	− 51.7	57 9 13.0	1 25.6	− 18 16 59.8	− 3.7	Y.	
58	29.990	78.7	75.0	− 43.3	75 4 21.1	3 24.3	− 36 14 6.6	− 0.9	Y.	
59	. .	. .	. .	− 1 16.6	65 43 48.4	2 2.2	− 26 52 11.8	− 3.7	Y.	
60	. .	. .	. .	− 2 13.8	65 37 48.7	2 1.6	− 26 46 11.5	− 4.7	Y.	
61	29.984	78.3	74.7	− 1 45.3	S. 69 28 18.5	2 26.8	− 30 37 6.5	− 4.9	Y.	
62	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
63	. .	. .	. .	− 6.0	N. 11 54 59.0	11.6	+ 50 48 49.4	− 8.8	Y.	
64	29.848	82.0	78.8	− 1 15.1	S. 63 8 46.8	1 47.6	− 24 16 55.6	+ 10.0	Y.	
65	. .	. .	. .	− 1 30.0	S. 73 28 34.4	3 2.4	− 34 37 58.0	+ 12.7	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. Sept, 4	1	B. A. C. 6210 . .	6.0	3	III–VII	74 45 4.7	56.0	4.7	1.8	5.6	7.6	3.40	30.309	−0.780	29.532
	2	B. A. C. 6270 . .	7.0	2	I, IX	85 30 1.3	52.3	2.3	58.2	2.8	4.1	0.15	28.287	. .	27.532
	3	Anon. 18h 21m 12s .	8.0	3	III–VII	" " "	"	"	"	"	"	"	26.962	. .	26.187
	4	B. A. C. 6334 . .	7.0	3	III–VII	91 40 4.2	54.4	3.7	58.0	4.4	5.8	1.75	34.267	. .	33.493
	5	B. A. C. 6377 . .	. .	3	III–VII	88 35 6.5	57.9	6.5	0.7	6.3	8.6	4.42	27.013	. .	26.238
	6	B. A. C. 6435 . .	7.0	3	III–VII	96 25 4.8	58.0	6.6	1.4	6.6	7.1	4.08	35.493	. .	34.720
	7	γ Lyræ	4.5	3	III–VII	26 20 8.7	0.6	9.2	5.1	10.8	11.0	7.57	26.732	. .	25.946
	8	B. A. C. 6546 . .	7.0	3	III–VII	86 10 5.7	57.1	7.3	2.9	7.3	8.1	4.73	30.328	. .	29.553
	9	Lacaille 8066 . .	6.5	3	III–VII	92 19 61.2	52.7	62.0	57.1	60.3	61.9	59.20	29.234	. .	28.460
	10	B. A. C. 6639 . .	5.8	3	III–VII	88 50 2.1	52.9	2.1	56.9	2.2	4.7	0.15	29.465	. .	28.691
	11	B. A. C. 6694 . .	6.5	3	III–VII	83 0 4.1	55.8	5.0	0.0	4.0	6.0	2.48	31.753	. .	30.977
	12	Lacaille 8196 . .	6.0	3	III–VII	96 40 5.8	58.1	7.8	2.8	6.2	8.7	4.90	31.233	. .	30.460
	13	Nadir	. .	. .	. .	199 59 59.9	50.8	61.0	55.3	59.7	63.0	58.28	30.576	. .	. .
	14	B. A. C. 6947 . .	6.0	3	III–VII	86 15 4.9	57.2	6.8	2.8	6.8	7.4	4.32	29.302	. .	28.527
	15	25 Vulpeculæ	. .	3	III–VII	34 50 4.0	55.5	4.5	58.3	3.8	5.4	1.92	30.277	. .	29.493
	16	B. A. C. 7070 . .	7.8	3	III–VII	81 25 7.1	58.4	7.8	3.0	7.3	8.9	5.42	27.445	. .	26.669
	17	τ² Capricorni . . .	5.5	3	III–VII	74 15 0.8	53.1	3.8	58.9	3.2	3.1	0.48	29.337	. .	28.560
	18	B. A. C. 7175 . .	5.5	3	III–VII	98 30 3.7	56.3	4.6	59.9	4.8	5.0	2.38	34.124	. .	33.352
	19	Lacaille 8649 . .	7.2	3	IV–VI	95 30 5.8	58.3	7.8	3.2	7.1	8.0	5.03	31.077	. .	30.299
	20	1 Piscis Australis. .	5.5	3	III–VII	91 34 59.8	52.2	61.4	56.0	59.2	61.0	58.27	29.688	. .	28.914
	21	Lacaille 8699 . .	6.6	3	III–VII	96 0 2.8	55.8	5.5	59.2	3.2	4.7	1.87	26.463	. .	25.690
	22	Lacaille 8758 . .	. .	3	III–VII	90 5 5.3	58.5	7.9	2.3	6.8	8.1	4.82	27.089	. .	26.315
6	23	B. A. C. 6103 . .	6.0	3	III–VII	94 45 3.9	55.5	5.8	1.7	4.7	5.7	2.88	31.416	−0.774	30.649
	24	Lacaille 7629 . .	7.0	3	III–VII	93 30 5.2	56.2	4.9	3.6	5.7	8.0	3.93	33.825	. .	33.058
	25	B. A. C. 6210 . .	6.0	3	III–VII	74 45 3.5	55.4	4.9	1.0	4.7	6.1	2.60	30.326	. .	29.555
	26	B. A. C. 6270 . .	7.0	2	I, IX	85 30 2.5	54.4	4.8	1.2	5.2	5.9	2.33	28.421	. .	27.672
	27	Anon. 18h 21m 14s .	8.0	3	III–VII	" " "	"	"	"	"	"	"	26.972	. .	26.203
	28	B. A. C. 6334 . .	7.0	3	III–VII	91 40 2.3	54.4	2.7	58.8	3.6	3.9	0.95	34.282	. .	33.514
	29	B A. C. 6377 . .	. .	3	V–IX	88 35 4.3	55.4	4.6	59.3	4.2	5.9	2.28	26.924	. .	26.158
	30	B. A. C. 6435 . .	. .	3	III–VII	96 25 5.9	59.8	8.9	4.0	8.2	9.0	5.97	35.695	. .	34.928
	31	γ Lyræ	. .	3	III–VII	26 20 3.8	56.3	4.9	59.6	5.1	5.2	2.48	26.583	. .	25.803
	32	B A. C. 6546 . .	6.5	3	III–VII	86 10 4.6	59.4	8.8	5.9	8.8	9.1	6.40	30.386	. .	29.617
	33	Lacaille 8066 . .	. .	3	III–VII	92 20 2.0	55.4	4.7	58.8	3.0	3.2	1.18	29.380	. .	28.612
	34	B. A. C. 6639 . .	6.0	3	III–VII	88 50 2.7	54.6	4.8	59.8	3.8	5.7	1.90	29.578	. .	28.810
	35	B. A. C. 6694 . .	6.8	3	III–VII	83 0 5.4	58.5	8.0	3.4	6.5	8.0	4.97	31.885	. .	31.115
	36	Lacaille 8196 . .	6.5	3	III–VII	96 40 2.2	56.3	5.3	1.9	4.0	5.2	2.48	31.279	. .	30.512
	37	Nadir	. .	.	. .	200 0 2.7	55.1	4.8	2.0	4.4	7.3	2.72	30.713	. .	. .
	38	62 Aquilæ	5.5	3	III–VII	59 55 6.8	58.5	8.2	4.3	7.8	10.4	6.00	28.768	. .	27.994
	39	B. A. C. 6947 . .	5.8	3	III–VII	86 15 3.2	56.2	5.9	1.5	4.9	5.2	2.82	29.299	. .	28.530
	40	25 Vulpeculæ . . .	. .	3	III–VII	34 50 3.2	53.9	3.9	59.5	3.2	4.4	1.35	30.271	. .	29.493
	41	B. A. C. 7064 . .	. .	2	I, IX	81 25 1.9	54.5	2.8	59.1	1.2	3.3	0.47	28.077	. .	27.323
	42	B. A. C. 7070 . .	. .	3	III–VII	" " "	"	"	"	"	"	"	27.285	. .	26.515
	43	τ² Capricorni . . .	5.5	3	III–VII	74 15 2.9	55.1	6.3	2.4	4.8	4.8	2.72	29.400	. .	28.629
	44	B. A. C. 7175 . .	. .	3	III–VII	98 29 60.4	53.1	62.0	56.7	60.6	61.6	59.07	34.021	. .	33.255
	45	Lacaille 8609 . .	7.5	3	III–VII	95 30 5.8	58.9	8.2	2.8	5.7	7.2	4.77	31.121	. .	30.354
	46	1 Piscis Australis. .	5.5	3	III–VII	91 35 5.4	58.9	7.0	2.4	4.9	7.0	4.27	29.934	. .	29.166
	47	Lacaille 8699 . .	6.5	3	III–VII	96 0 5.5	59.8	9.2	4.6	8.4	9.0	6.08	26.711	. .	25.944
	48	Lacaille 8758 . .	7.0	3	III–VII	90 5 3.7	57.7	6.4	1.6	5.2	6.6	3.53	27.098	. .	26.330
7	49	B. A. C. 6103 . .	6.0	3	III–VII	94 45 5.2	58.8	7.7	5.0	5.9	6.7	4.88	31.595	−0.740	30.862
	50	Lacaille 7629 . .	6.5	3	III–VII	93 30 4.2	57.3	5.2	4.3	4.7	6.2	3.65	33.840	. .	33.107
	51	B. A. C. 6199 . .	6.5	3	III–VII	84 30 6.0	59.7	9.0	6.2	7.7	8.2	6.13	29.444	. .	28.709
	52	Lacaille 7708 . .	6.8	3	III–VII	94 55 4.8	58.3	7.7	5.5	6.2	6.2	4.78	29.726	. .	28.993
	53	B. A. C. 6317 . .	6.5	3	III–VII	91 50 0.7	52.9	2.8	0.8	1.8	1.6	0.10	30.442	. .	29.708
	54	λ Coronæ Australis .	5.5	3	III–VII	97 15 2.8	56.4	5.8	1.5	3.5	4.0	2.33	28.448	. .	27.716
	55	B. A. C. 6401 . .	7.0	3	III–VII	85 45 3.8	55.8	6.9	2.9	4.2	4.7	3.05	28.291	. .	27.556
	56	B. A. C. 6455 . .	7.0	3	III–VII	89 50 2.4	54.9	3.8	1.0	1.7	2.3	1.02	29.909	. .	29.175
	57	Lacaille 7990 . .	6.3	3	III–VII	96 50 5.3	1.3	9.9	7.0	8.6	7.9	6.67	32.817	. .	32.084
	58	B. A. C. 6562 . .	6.0	3	III–VII	85 0 1.3	56.0	4.7	2.4	2.7	4.2	1.88	33.526	. .	32.791
	59	Lacaille 8077 . .	6.5	3	III–VII	94 5 3.8	58.0	6.7	3.6	4.7	5.5	3.72	34.326	. .	33.593
	60	Lacaille 8128 . .	8.0	3	III–VII	95 5 3.4	57.8	6.4	5.3	4.7	5.0	3.77	33.861	. .	33.128
	61	Lacaille 8185 . .	7.0	3	III–VII	96 0 4.2	59.8	9.1	4.5	6.8	7.5	5.32	29.859	. .	29.126
	62	Lacaille 8231 . .	7.0	3	III–VII	96 55 5.8	2.4	9.5	7.0	7.3	9.0	6.83	31.120	. .	30.388
	63	b Sagittarii	5.5	3	III–VII	86 20 5.6	0.9	9.4	8.9	6.6	8.5	6.65	28.097	. .	27.362
	64	64 Sagittarii	6.0	3	III–VII	70 50 6.0	2.1	10.2	9.6	8.8	10.1	7.80	31.969	. .	31.231
	65	B. A. C. 6948 . .	6.3	3	III–VII	89 15 3.0	58.1	6.0	2.0	2.8	5.0	2.82	32.219	−0.740	31.485

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	+ 14.7	S. 54 45 18.1	1 17.3	− 15 52 56.6	+ 6.0	Y.	
2	. .	. .	. .	+ 1 17.4	65 31 17.5	1 59.7	− 26 39 38.4	+ 9.0	Y.	
3	. .	. .	. .	+ 1 59.5	65 31 59.6	1 59.7	− 26 40 20.5	+ 9.0	Y.	
4	29.870	81.5	78.5	− 1 49.5	71 38 12.2	2 43.5	− 32 47 16.9	+ 10.3	Y.	
5	. .	. .	. .	+ 1 57.9	68 37 2.3	2 18.9	− 29 45 42.4	+ 8.6	Y.	
6	. .	. .	. .	− 2 27.9	76 22 36.2	3 41.7	− 37 32 39.1	+ 10.4	Y.	
7	. .	. .	. .	+ 2 7.0	6 22 14.6	6.1	+ 32 31 18.1	− 8.9	Y.	
8	29.876	81.2	78.0	+ 14.0	66 10 18.7	2 3.5	− 27 18 43.4	+ 5.9	Y.	
9	. .	. .	. .	+ 48.2	72 20 47.4	2 50.5	− 33 29 59.1	+ 7.0	Y.	
10	. .	. .	. .	+ 41.0	68 50 41.2	2 20.9	− 29 59 23.3	+ 5.2	Y.	
11	. .	. .	. .	− 30.6	62 59 31.9	1 47.4	− 24 7 40.5	+ 2.8	Y.	
12	29.886	81.0	76.6	− 14.4	76 39 50.5	3 47.3	− 37 49 59.0	+ 5.8	Y.	
13	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
14	29.900	80.5	75.4	+ 46.2	66 15 50.5	2 4.7	− 27 24 16.4	− 0.2	Y.	
15	. .	. .	. .	+ 15.9	14 50 17.8	14.6	+ 24 3 6.4	− 11.0	Y.	
16	. .	. .	. .	+ 1 44.4	61 26 49.8	1 41.1	− 22 34 52.1	− 3.0	Y.	
17	. .	. .	. .	+ 45.1	54 15 45.6	1 16.9	− 15 23 23.7	− 5.2	Y.	
18	29.900	80.0	74.4	− 1 45.1	78 28 17.3	4 23.6	− 39 39 2.1	− 0.6	Y.	
19	. .	. .	. .	− 9.4	75 29 55.7	3 29.9	− 36 39 46.8	− 2.1	Y.	
20	. .	. .	. .	+ 34.0	71 35 32.3	2 44.3	− 32 44 37.8	− 3.8	Y.	
21	. .	. .	. .	+ 2 15.1	76 2 16.9	3 38.1	− 37 12 16.2	− 3.8	Y.	
22	29.904	79.3	74.3	+ 1 55.5	70 7 0.3	2 31.5	− 31 15 53.0	− 5.8	Y.	
23	29.928	80.3	76.1	− 20.3	74 44 42.5	3 19.1	− 35 54 22.8	+ 14.0	Y.	
24	. .	. .	. .	− 1 35.9	73 28 28.1	3 3.5	− 34 37 52.8	+ 12.8	Y.	
25	. .	. .	. .	+ 13.9	54 45 16.5	1 18.0	− 15 52 55.7	+ 6.1	Y.	
26	. .	. .	. .	+ 1 13.0	65 31 15.3	2 0.6	− 26 39 37.1	+ 9.1	Y.	
27	. .	. .	. .	+ 1 59.0	65 32 1.3	2 0.7	− 26 40 23.2	+ 9.1	Y.	
28	29.942	79.8	75.3	− 1 50.2	71 38 10.8	2 44.7	− 32 47 16.7	+ 10.5	Y.	
29	. .	. .	. .	+ 2 0.4	68 37 2.7	2 20.3	− 29 45 44.2	+ 8.8	Y.	
30	29.940	79.5	73.9	− 2 34.4	76 22 31.5	3 44.0	− 37 32 36.7	+ 10.6	Y.	
31	. .	. .	. .	+ 2 11.5	6 22 14.0	6.2	+ 32 31 18.6	− 9.1	Y.	
32	. .	. .	. .	+ 12.0	66 10 18.4	2 4.9	− 27 18 44.5	+ 6.1	Y.	
33	29.956	79.0	73.0	+ 43.4	72 20 44.6	2 52.4	− 33 29 58.2	+ 7.1	Y.	
34	. .	. .	. .	+ 37.3	68 50 39.2	2 22.4	− 29 59 22.8	+ 5.4	Y.	
35	. .	. .	. .	− 34.9	62 59 30.0	1 48.6	− 24 7 39.8	+ 2.9	Y.	
36	29.962	78.7	72.4	− 16.0	76 39 46.4	3 49.7	− 37 49 57.3	+ 6.1	Y.	
37	. .	. .	. .	. . .	. . . .	. .	. . . .	. .	Y.	
38	. .	. .	. .	+ 1 2.9	39 56 8.9	46.6	− 1 3 16.7	− 4.8	Y.	
39	29.970	78.2	71.6	+ 46.1	66 15 48.9	2 6.2	− 27 24 16.3	0.0	Y.	
40	. .	. .	. .	+ 15.9	14 50 17.2	14.8	+ 24 3 6.8	− 11.3	Y.	
41	. .	. .	. .	+ 1 23.9	61 26 24.4	1 42.1	− 22 34 27.7	− 2.8	Y.	
42	. .	. .	. .	+ 1 49.2	61 26 49.7	1 42.1	− 22 34 53.0	− 2.8	Y.	
43	. .	. .	. .	+ 43.0	54 15 45.7	1 17.4	− 15 23 24.3	− 5.1	Y.	
44	29.982	77.5	70.6	− 1 42.0	78 28 17.0	4 26.2	− 39 39 4.4	− 0.3	Y.	
45	. .	. .	. .	− 11.1	75 29 53.7	3 32.2	− 36 39 47.1	− 1.8	Y.	
46	. .	. .	. .	+ 26.1	71 35 30.4	2 46.0	− 32 44 37.6	− 2.5	Y.	
47	. .	. .	. .	+ 2 7.1	76 2 13.2	3 40.4	− 37 12 14.8	− 3.4	Y.	
48	29.990	77.0	70.2	+ 1 55.0	70 6 58.6	2 33.1	− 31 15 52.9	− 5.5	Y.	
49	30.070	75.8	70.6	− 27.0	74 44 37.9	3 22.1	− 35 54 21.2	+ 14.1	Y.	
50	. .	. .	. .	− 1 37.4	73 28 26.3	3 6.4	− 34 37 53.9	+ 12.9	Y.	
51	. .	. .	. .	+ 40.5	64 30 46.6	1 57.1	− 25 39 4.9	+ 9.6	Y.	
52	30.074	75.3	69.1	+ 31.6	74 55 36.3	3 25.2	− 36 5 22.7	+ 12.5	Y.	
53	. .	. .	. .	+ 9.1	71 50 9.2	2 49.4	− 32 59 19.8	+ 10.8	Y.	
54	. .	. .	. .	+ 1 11.6	77 16 13.9	4 3.4	− 38 26 38.5	+ 11.9	Y.	
55	. .	. .	. .	+ 1 16.6	65 46 19.7	2 4.4	− 26 54 45.3	+ 7.6	Y.	
56	30.086	74.5	67.9	+ 25.9	69 50 26.9	2 32.1	− 30 59 20.2	+ 8.3	Y.	
57	. .	. .	. .	− 1 5.3	76 49 1.4	3 55.6	− 37 59 18.2	+ 9.8	Y.	
58	. .	. .	. .	− 1 27.4	64 58 34.4	2 0.2	− 26 6 55.8	+ 5.5	Y.	
59	. .	. .	. .	− 1 52.6	74 3 11.1	3 14.7	− 35 12 47.0	+ 7.6	Y.	
60	30.094	73.3	66.4	− 1 38.0	75 3 25.7	3 28.3	− 36 13 15.2	+ 7.0	Y.	
61	. .	. .	. .	+ 27.4	76 0 32.7	3 42.7	− 37 10 36.6	+ 6.2	Y.	
62	. .	. .	. .	− 12.2	76 54 54.7	3 58.1	− 38 5 14.0	+ 5.7	Y.	
63	. .	. .	. .	+ 1 22.7	66 21 29.3	2 8.4	− 27 29 58.9	+ 1.9	Y.	
64	. .	. .	. .	− 38.6	50 49 29.2	1 9.4	− 11 56 59.8	− 3.0	Y.	
65	30.092	72.5	65.4	− 46.5	S. 69 14 16.3	2 28.1	− 30 23 5.6	+ 0.8	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
1875.						° ′ ″	″	″	″	″	″	″	r.	r.	r
Sept. 7	1	Lacaille 8421	. .	3	III–VII	94 20 4.4	57.9	6.5	6.0	5.3	6.7	4.47	27.005	−0.740	26.272
	2	41 Cygni	. .	3	III–VII	28 55 6.2	2.8	12.1	10.9	11.2	10.1	8.88	28.846	. .	28.100
	3	B. A. C. 7133	7.0	3	III–VII	83 25 3.0	58.1	7.5	3.4	3.7	4.7	3.40	31.689	. .	30.953
	4	B. A. C. 7197	. .	3	III–VII	82 5 5.9	59.8	9.2	6.8	6.2	7.0	5.82	34.047	. .	33.311
	5	17 Delphini	5.5	3	III–VII	45 40 6.7	2.1	12.2	9.9	8.9	9.1	8.15	34.343	. .	33.601
	6	δ Microscopii	5.5	3	III–VII	89 30 4.9	0.8	9.1	7.1	5.3	7.5	5.78	34.258	. .	33.524
	7	Lacaille 8725	6.0	3	III–VII	95 45 5.2	0.9	10.0	6.5	6.6	7.6	6.12	28.946	. .	28.213
	8	Nadir	. .	.	. .	200 0 0.0	55.5	4.7	2.1	0.4	3.2	0.98	30.621	. .	. .
8	9	B. A. C. 6098	. .	3	III–VII	79 35 3.7	55.6	5.2	4.0	4.2	5.4	3.02	28.433	−0.750	27.687
	10	12 Sagittarii	7.2	3	III–VII	82 0 2.8	53.8	3.1	59.6	2.1	4.0	0.90	29.301	. .	28.555
	11	B. A. C. 6199	7.0	3	V–IX	84 30 6.7	59.9	8.8	5.8	8.8	9.9	6.65	29.472	. .	28.728
	12	Lacaille 7708	7.0	3	III–VII	94 55 2.7	54.7	3.7	1.1	3.2	3.9	1.55	29.613	. .	28.870
	13	B. A. C. 6317	6.5	3	III–VII	91 50 3.7	56.4	4.7	1.0	3.6	5.0	2.40	30.477	. .	29.733
	14	Lacaille 7823	6.5	3	III–VII	98 15 8.0	0.0	7.1	4.7	7.3	8.1	5.87	33.556	. .	32.814
	15	B. A. C. 6401	6.5	3	III–VII	85 45 4.4	56.2	6.8	4.0	6.9	5.8	4.02	28.287	. .	27.542
	16	B. A. C. 6455	. .	3	IV–VI	89 50 5.8	59.3	7.0	3.9	5.4	6.8	4.70	29.961	. .	29.213
	17	Lacaille 7990	6.0	3	III–VII	96 50 4.2	59.2	7.9	3.6	7.2	6.7	4.80	32.707	. .	31.964
	18	B. A. C. 6562	6.0	3	III–VII	85 0 5.7	58.3	8.7	6.0	8.2	8.9	5.97	33.647	. .	32.902
	19	Lacaille 8077	6.0	3	III–VII	94 5 3.3	56.1	5.1	1.8	4.7	5.2	2.70	34.259	. .	33.516
	20	Lacaille 8128	7.7	3	III–VII	95 5 4.9	57.0	6.9	3.9	5.8	6.3	4.13	33.870	. .	33.127
	21	Lacaille 8185	6.5	3	III–VII	96 0 2.8	7.3	6.0	2.2	4.9	5.0	4.70	29.759	. .	29.016
	22	B. A. C. 6814	6.0	3	III–VII	83 5 2.6	55.1	4.1	1.3	3.2	3.2	1.58	27.311	. .	26.565
	23	B. A. C. 6864	6.0	3	IV–VI	81 55 2.8	56.2	4.2	1.2	3.8	4.0	2.03	27.704	. .	26.955
	24	64 Sagittarii	6.0	3	III–VII	70 50 5.2	1.0	8.2	7.2	8.0	9.2	6.47	31.884	. .	31.136
	25	B. A. C. 6948	. .	3	III–VII	89 15 3.0	57.3	3.9	1.2	3.2	5.0	2.27	32.166	. .	31.422
	26	Lacaille 8421	7.0	3	III–VII	94 20 3.5	55.9	5.8	3.2	4.9	5.7	3.17	26.923	. .	26.180
	27	41 Cygni	5.0	3	III–VII	28 55 2.2	56.5	6.9	3.9	6.8	6.0	3.72	28.709	. .	27.953
	28	B. A. C. 7133	6.5	3	III–VII	83 25 6.2	0.4	9.2	7.5	8.4	9.0	6.78	31.761	. .	31.015
	29	B. A. C. 7197	6.5	3	III–VII	82 5 3.4	56.5	5.7	3.2	3.9	4.8	2.92	33.936	. .	33.190
	30	17 Delphini	5.0	3	III–VII	45 40 0.8	54.3	4.7	0.5	2.5	3.4	1.03	34.135	. .	33.383
	31	A Capricorni	. .	3	III–VII	84 25 5.6	0.4	10.6	7.3	8.9	8.1	6.82	37.017	. .	36.272
	32	Lacaille 8725	. .	3	III–VII	95 45 3.8	58.2	7.4	3.6	5.3	6.4	4.12	28.802	. .	28.059
	33	θ¹ Microscopii	5.5	3	III–VII	100 10 3.1	57.9	5.8	2.0	4.3	4.6	2.95	33.549	. .	32.807
	34	Nadir	. .	.	. .	200 0 1.9	55.3	4.8	2.3	2.2	5.1	1.93	30.663	. .	. .
9	35	B. A. C. 6098	6.5	3	III–VII	79 34 60.5	52.4	61.8	59.0	60.7	63.3	59.62	28.151	−0.633	27.522
	36	12 Sagittarii	. .	3	III–VII	82 0 3.7	55.8	3.8	2.3	3.6	5.9	2.52	29.185	. .	28.556
	37	Lacaille 7657	6.5	3	III–VII	93 35 5.3	58.5	5.8	5.4	7.1	8.3	5.07	31.657	. .	31.031
	38	B. A. C. 6244	7.0	3	III–VII	90 39 60.7	52.3	60.4	55.8	59.3	60.1	58.10	29.638	. .	29.011
	39	Lacaille 7765	7.0	3	III–VII	98 35 6.9	0.2	6.8	5.0	7.9	8.7	5.92	27.625	. .	27.000
	40	Lacaille 7823	. .	3	III–VII	98 15 4.1	55.8	4.1	0.5	4.3	5.1	2.32	33.225	. .	32.600
	41	B. A. C. 6413	5.5	3	III–VII	88 25 7.9	0.4	8.2	4.3	8.4	10.8	6.72	34.727	. .	34.099
	42	B. A. C. 6474	7.0	3	III–VII	87 5 3.5	58.1	5.5	3.2	5.9	7.8	4.00	31.215	. .	30.587
	43	B. A. C. 6531	7.0	3	III–VII	84 45 4.7	57.4	8.1	3.1	7.1	8.1	4.75	29.948	. .	29.320
	44	B. A. C. 6569	7.0	3	III–VII	88 20 2.8	55.3	3.0	0.0	2.8	4.9	1.47	33.254	. .	32.626
	45	ρ² Sagittarii	6.0	3	III–VII	77 25 3.7	55.2	5.8	1.0	6.6	6.8	3.18	31.665	. .	31.035
	46	B. A. C. 6684	6.5	3	III–VII	89 30 6.9	0.4	6.9	4.3	7.4	8.5	5.73	33.021	. .	32.394
	47	Lacaille 8186	6.5	3	III–VII	95 44 58.8	52.8	62.3	57.6	61.2	61.3	59.00	29.878	. .	29.252
	48	B. A. C. 6795	7.0	3	III–VII	86 15 1.5	54.7	3.0	0.0	3.4	4.0	1.10	29.824	. .	29.196
	49	Lacaille 8293	6.0	3	III–VII	96 55 4.0	57.7	6.7	0.0	5.1	6.1	3.27	36.104	. .	35.479
	50	Lacaille 8341	7.0	3	III–VII	94 50 4.2	57.4	6.6	2.8	6.1	6.9	4.00	28.715	. .	28.089
	51	B. A. C. 6948	6.0	3	III–VII	89 15 8.1	1.3	8.6	4.8	8.1	9.6	6.75	32.125	. .	31.498
	52	Lacaille 8432	7.5	3	III–VII	92 55 5.1	58.9	6.4	3.9	5.5	7.1	4.48	34.483	. .	33.856
	53	Lacaille 8492	6.0	3	III–VII	89 45 1.9	55.8	4.1	2.0	3.5	4.5	1.97	30.531	. .	29.904
	54	B. A. C. 7148	7.0	3	III–VII	87 20 1.5	53.0	2.4	57.9	2.2	3.5	0.08	35.202	. .	34.574
	55	4 Aquarii	5.8	3	III–VII	64 59 61.2	52.1	62.7	57.9	62.8	63.1	59.97	34.225	. .	33.593
	56	20 Capricorni	. .	3	III–VII	78 25 5.2	58.9	7.7	4.1	7.7	8.4	5.33	34.366	. .	33.736
	57	f² Cygni	6.0	3	III–VII	11 45 3.7	56.2	7.1	3.8	7.9	7.8	4.42	31.284	. .	30.641
	58	θ¹ Microscopii	. .	3	III–VII	100 10 7.2	0.4	8.0	5.1	7.6	8.4	6.12	33.413	. .	33.788
	59	b Capricorni	5.0	3	III–VII	81 15 2.7	56.7	4.5	1.9	3.4	5.2	2.40	34.853	. .	34.224
	60	Nadir	. .	.	. . .	199 59 60.1	52.9	62.2	58.6	60.6	65.1	59.92	30.485	. .	. .
14	61	B. A. C. 6244	7.0	3	III–VII	90 40 3.3	56.4	4.1	1.1	3.8	4.4	2.18	29.767	−0.598	29.175
	62	B. A. C. 6334	7.0	3	III–VII	91 40 2.7	56.8	3.7	59.9	4.7	5.0	2.13	34.227	. .	33.635
	63	5 Aquilæ (1st *)	6.0	2	I, IX	60 0 1.7	54.7	4.7	59.9	4.7	5.7	1.90	33.830	. .	33.233
	64	5 Aquilæ (2d *)	. .	3	III–VII	" " "	"	"	"	"	"	"	33.573	. .	32.975
	65	B. A. C. 6444	6.0	3	III–VII	96 20 3.8	59.8	7.5	4.9	8.2	7.1	.22	30.658	. .	30.067
	66	B. A. C. 6505	7.0	3	III–VII	84 15 4.9	0.2	8.2	3.2	9.3	8.2	5.67	27.729	−0.598	27.136

Number.	Barometer.	THERM'S. At.	THERM'S. Ex.	Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	+ 1 56.8	S. 74 22 1.3	3 19.4	− 35 31 41.9	+ 1.4	Y.	
2	. .	. .	. .	+ 59.5	8 56 8.4	8.9	+ 29 57 21.5	− 12.4	Y.	
3	. .	. .	. .	− 29.9	63 24 33.5	1 52.7	− 24 32 47.4	− 3.1	Y.	
4	30.090	71.5	64.3	− 1 43.8	62 3 22.0	1 46.5	− 23 11 29.7	− 4.2	Y.	
5	. .	. .	. .	− 1 52.9	25 38 15.3	27.2	+ 13 14 56.3	− 11.5	Y.	
6	. .	. .	. .	− 1 50.5	69 28 15.3	2 30.4	− 30 37 6.9	− 4.3	Y.	
7	30.096	71.0	63.7	+ 56.0	75 46 2.1	3 40.0	− 36 56 3.3	− 3.8	Y.	
8	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
9	30.154	76.0	72.5	+ 1 12.5	59 36 15.5	1 35.1	− 20 44 11.8	+ 9.0	Y.	
10	. .	. .	. .	+ 45.3	62 0 46.2	1 45.0	− 23 8 52.4	+ 9.1	Y.	
11	. .	. .	. .	+ 39.9	64 30 46.5	1 57.0	− 25 39 4.7	+ 9.6	Y.	
12	. .	. .	71.4	+ 35.4	74 55 37.0	3 24.9	− 36 5 23.1	+ 12.5	Y.	
13	. .	. .	. .	+ 8.4	71 50 10.8	2 49.2	− 32 59 21.2	+ 10.9	Y.	
14	30.166	75.5	71.0	− 1 28.2	78 13 37.7	4 22.2	− 39 24 21.1	+ 12.4	Y.	
15	. .	. .	. .	+ 1 17.1	65 46 21.1	2 4.1	− 26 54 46.4	+ 7.6	Y.	
16	. .	. .	. .	+ 24.7	69 50 29.4	2 31.8	− 30 59 22.4	+ 8.4	Y.	
17	30.172	75.2	70.2	− 1 1.6	76 49 3.2	3 55.0	− 37 59 19.4	+ 9.9	Y.	
18	. .	. .	. .	− 1 30.9	64 58 35.0	1 59.9	− 26 6 56.1	+ 5.5	Y.	
19	. .	. .	. .	− 1 50.2	74 3 12.5	3 14.2	− 35 12 47.9	+ 7.6	Y.	
20	. .	. .	. .	− 1 38.0	75 3 26.1	3 27.6	− 36 13 14.9	+ 7.0	Y.	
21	30.164	74.5	68.8	+ 30.9	76 0 35.5	3 42.0	− 37 10 38.7	+ 6.3	Y.	
22	. .	. .	. .	+ 1 47.7	63 6 49.2	1 50.7	− 24 15 1.1	+ 1.3	Y.	
23	. .	. .	. .	+ 1 35.4	61 56 37.5	1 45.5	− 23 4 44.2	+ 0.4	Y.	
24	. .	. .	. .	− 35.6	50 49 30.9	1 9.2	− 11 57 1.3	− 3.0	Y.	
25	. .	. .	. .	− 44.6	69 14 17.7	2 27.8	− 30 23 6.7	+ 1.0	Y.	
26	30.176	73.5	67.7	+ 1 59.7	74 22 2.9	3 18.9	− 35 31 43.0	+ 1.5	Y.	
27	. .	. .	. .	+ 1 4.2	8 56 7.9	8.9	+ 29 57 22.0	− 12.6	Y.	
28	. .	. .	. .	− 31.8	63 24 35.0	1 52.4	− 24 32 48.6	− 3.0	Y.	
29	. .	. .	. .	− 1 40.0	62 3 23.0	1 46.2	− 23 11 30.4	− 4.0	Y.	
30	. .	. .	. .	− 1 46.0	25 38 15.0	27.1	+ 13 14 56.7	− 11.6	Y.	
31	30.180	73.2	67.4	− 3 16.6	64 21 50.3	1 57.3	− 25 30 8.8	− 5.5	Y.	
32	. .	. .	. .	+ 1 0.8	75 46 4.9	3 39.0	− 36 56 5.1	− 3.7	Y.	
33	30.192	73.0	67.3	− 1 28.0	80 8 35.0	5 13.7	− 41 20 9.9	− 3.6	Y.	
34	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
35	30.120	77.5	77.0	+ 1 17.7	59 36 17.3	1 34.2	− 20 44 12.7	+ 8.9	Y.	
36	. .	. .	. .	+ 45.3	62 0 47.8	1 44.0	− 23 8 53.0	+ 9.1	Y.	
37	. .	. .	. .	− 32.3	73 34 32.8	3 5.7	− 34 43 59.7	+ 12.8	Y.	
38	30.120	77.3	76.3	+ 31.0	70 40 29.1	2 36.7	− 31 49 27.0	+ 11.2	Y.	
39	. .	. .	. .	+ 1 34.0	78 36 39.9	4 27.8	− 39 47 28.9	+ 13.2	Y.	
40	. .	. .	. .	− 1 21.5	78 13 40.8	4 19.5	− 39 24 21.5	+ 12.5	Y.	
41	. .	. .	. .	− 2 8.4	68 22 58.3	2 19.2	− 29 31 38.7	+ 8.4	Y.	
42	30.120	77.3	75.3	− 18.4	67 4 45.6	2 10.7	− 28 13 17.5	+ 7.4	Y.	
43	. .	. .	. .	+ 21.3	64 45 26.1	1 57.4	− 25 53 44.7	+ 6.0	Y.	
44	. .	. .	. .	− 1 22.3	68 18 39.2	2 18.9	− 29 27 19.3	+ 6.5	Y.	
45	. .	. .	. .	− 32.4	57 24 30.7	1 26.9	− 18 32 18.8	+ 2.5	Y.	
46	. .	. .	. .	− 1.15.1	69 28 50.7	2 27.6	− 30 37 39.5	+ 4.2	Y.	
47	30.116	77.0	74.0	+ 23.4	75 45 22.4	3 35.6	− 36 55 19.2	+ 6.3	Y.	
48	. .	. .	. .	+ 25.2	66 15 26.3	2 6.0	− 27 23 53.5	+ 2.5	Y.	
49	. .	. .	. .	− 2 51.7	76 52 11.5	3 54.0	− 38 2 26.7	+ 4.8	Y.	
50	. .	. .	. .	+ 59.9	74 51 3.9	3 22.8	− 36 0 47.9	+ 3.4	Y.	
51	. .	. .	. .	− 46.9	69 14 19.8	2 26.0	− 30 23 7.0	+ 1.0	Y.	
52	30.110	76.8	72.8	− 2 0.8	72 53 3.6	2 59.1	− 34 2 23.9	+ 1.0	Y.	
53	. .	. .	. .	+ 3.0	69 45 5.0	2 30.1	− 30 53 56.3	− 0.8	Y.	
54	. .	. .	. .	− 2 23.3	67 17 36.7	2 12.6	− 28 26 10.5	− 2.2	Y.	
55	. .	. .	. .	− 1 52.6	44 58 7.4	55.7	− 6 5 24.3	− 8.0	Y.	
56	. .	. .	. .	− 1 57.1	S. 58 23 8.2	1 30.5	− 19 30 59.9	− 5.9	Y.	
57	. .	. .	. .	− 20.1	N. 8 15 15.7	8.1	+ 47 9 2.6	− 14.9	Y.	
58	30.100	76.0	72.8	− 1 27.4	S. 80 8 38.8	5 9.5	− 41 20 9.5	− 3.4	Y.	
59	. .	. .	. .	− 2 12.4	61 12 50.0	1 41.2	− 22 20 52.4	− 8.1	Y.	
60	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
61	30.240	72.4	70.4	+ 25.8	70 40 28.0	2 39.2	− 31 49 28.4	+ 11.2	Y.	
62	. .	. .	. .	− 1 54.0	71 38 8.2	2 48.1	− 32 47 17.5	+ 10.6	Y.	
63	. .	. .	. .	− 1 41.3	39 58 19.6	47.3	− 1 5 28.1	− 0.7	Y.	
64	. .	. .	. .	− 1 33.2	39 58 28.7	47.3	− 1 5 37.2	− 0.7	Y.	
65	30.240	72.3	69.2	− 2.1	76 20 3.1	3 47.7	− 37 30 12.0	+ 10.8	Y.	
66	. .	. .	. .	+ 1 29.7	S. 64 16 35.4	1 56.7	− 25 24 53.3	+ 6.1	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. Sept. 14	1	B. A. C. 6569 . .	7.0	3	III-VII	88 20 3.8	58.8	4.7	2.0	6.2	7.1	3.77	33.366	−0.598	32.773
	2	ρ^2 Sagittarii	6.0	3	III-VII	77 25 5.1	58.9	7.7	4.1	9.2	8.1	5.52	31.745	. .	31.150
	3	B. A. C. 6684 . .	. .	3	V-IX	89 30 6.7	1.9	8.3	6.1	8.8	8.9	6.78	33.121	. .	32.531
	4	Lacaille 8186 . .	6.5	3	III-VII	95 45 1.8	57.8	4.9	1.1	4.9	4.7	2.53	30.061	. .	29.470
	5	B. A. C. 6795 . .	7.0	3	III-VII	86 15 2.9	58.7	6.2	5.4	7.1	6.8	4.52	29.947	. .	29.354
	6	Lacaille 8293 . .	. .	3	III-VII	96 55 4.5	1.2	8.7	5.0	7.7	8.1	5.87	36.225	. .	35.635
	7	Lacaille 8341 . .	7.0	3	III-VII	94 50 1.4	56.3	4.8	2.1	4.6	5.0	2.37	28.763	. .	28.172
	8	B. A. C. 6948 . .	. .	3	III-VII	89 15 1.8	57.1	2.8	59.4	2.8	4.9	1.47	32.022	. .	31.430
	9	Lacaille 8432 . .	7.5	3	III-VII	92 54 59.3	53.7	60.4	58.4	60.5	60.7	58.83	34.400	. .	33.808
	10	Lacaille 8492 . .	6.0	3	III-VII	89 45 4.8	1.2	7.8	5.1	8.1	7.6	5.77	30.755	. .	30.163
	11	B. A. C. 7148 . .	6.5	3	III-VII	87 20 6.8	1.1	8.8	7.2	9.4	9.1	7.07	35.467	. .	34.874
	12	4 Aquarii	6.0	3	III-VII	65 0 4.6	58.8	7.7	6.1	7.6	8.0	5.47	34.398	. .	33.801
	13	f^2 Cygni	. .	3	III-VII	11 45 6.6	0.6	10.6	8.0	12.0	9.9	7.95	31.408	. .	30.800
	14	Nadir	. .	.	. .	200 0 0.3	56.2	3.9	0.9	3.2	5.2	1.62	30.433	. .	. .
	15	B. A. C. 7515 . .	6.5	3	III-VII	59 50 6.0	1.1	8.5	5.8	9.4	10.1	6.82	31.536	. .	30.938
	16	Lacaille 8907 . .	7.0	3	III-VII	87 35 3.8	56.8	5.5	3.9	5.4	5.8	3.53	34.121	. .	33.528
	17	Lacaille 8965 . .	. .	3	III-VII	90 5 1.9	57.8	5.6	2.2	4.8	5.1	2.90	35.166	. .	34.574
	18	Lacaille 9004 . .	6.5	3	III-VII	89 20 0.3	55.2	2.5	59.5	1.2	2.2	0.15	28.011	. .	27.419
	19	B. A. C. 7729 . .	6.5	3	III-VII	86 35 2.1	57.9	5.3	4.9	4.8	5.6	3.43	26.407	. .	25.814
16	20	B. A. C. 6127 . .	. .	3	V-IX	87 20 1.9	55.7	3.8	3.8	4.8	4.4	2.40	31.105	−0.647	30.465
	21	B. A. C. 6217 . .	. .	3	III-VII	83 50 3.8	57.2	5.6	3.9	6.2	5.0	3.65	30.580	. .	29.937
	22	23 Sagittarii	6.5	3	III-VII	82 10 5.7	59.5	7.6	4.9	8.7	7.0	3.90	27.090	. .	26.447
	23	2 Aquilæ	6.0	3	III-VII	68 5 6.3	1.3	9.9	7.8	11.3	10.9	7.92	34.972	. .	34.327
	24	B. A. C. 6444 . .	. .	3	III-VII	96 20 4.1	0.2	8.7	7.2	9.7	7.6	6.25	30.535	. .	29.895
	25	B. A. C. 6505 . .	7.0	2	V, VII	84 15 3.4	58.1	6.8	3.9	7.8	5.6	4.27	27.649	. .	27.005
	26	Nadir	. .	.	. . .	200 0 3.5	58.0	6.2	3.0	6.2	7.7	4.10	30.678	. .	. .
20	27	2 Aquilæ	6.0	3	III-VII	68 5 3.9	0.8	8.8	7.1	8.3	7.7	6.10	34.915	−0.569	34.348
	28	B. A. C. 6413 . .	6.2	3	III-VII	88 25 4.1	0.5	7.4	4.2	5.4	5.9	4.58	34.731	. .	34.167
	29	*g* Aquilæ	6.0	3	III-VII	62 45 3.3	59.6	6.0	4.9	5.8	5.2	4.13	29.849	. .	29.281
	30	B. A. C. 6569 . .	. .	3	III-VII	88 20 5.8	2.1	9.6	5.3	7.2	7.1	6.18	33.461	. .	32.897
	31	Lacaille 8066 . .	6.5	3	III-VII	92 20 0.9	59.0	5.7	3.9	3.7	1.4	2.43	29.354	. .	28.791
	32	B. A. C. 6663 . .	5.8	3	IV-VI	39 15 1.9	59.2	6.1	5.8	6.2	4.9	4.02	31.686	. .	31.116
	33	Lacaille 8159 . .	6.5	3	III-VII	91 50 5.2	3.1	10.2	8.0	8.7	6.0	6.87	33.218	. .	32.655
	34	e^2 Sagittarii . . .	5.5	3	III-VII	75 20 5.3	2.8	11.8	9.9	9.2	6.6	7.60	36.220	. .	35.654
	35	B. A. C. 6786 . .	7.0	3	III-VII	85 55 3.1	0.7	8.9	8.2	6.3	5.1	5.38	34.085	. .	33.521
	36	Lacaille 8302 . .	7.0	3	III-VII	91 20 1.9	59.2	6.9	2.9	3.8	1.7	2.73	27.271	. .	26.708
	37	Nadir	. .	.	. . .	200 0 0.0	57.4	5.0	2.7	1.7	2.7	1.58	30.465	. .	. .
	38	B. A. C. 7021 . .	7.0	3	III-VII	85 50 4.5	1.5	11.0	7.9	8.4	5.7	6.50	32.405	. .	31.841
	39	Lacaille 8497 . .	. .	3	III-VII	100 30 5.3	1.4	9.5	7.5	7.0	6.2	6.15	35.177	. .	34.617
	40	17 Capricorni . . .	5.8	3	III-VII	80 50 6.6	3.3	12.0	10.8	9.6	7.6	8.32	31.086	. .	30.521
	41	B. A. C. 7248 . .	6.5	3	III-VII	78 10 4.9	3.8	12.1	9.9	9.6	7.5	7.97	34.687	. .	34.121
	42	Lacaille 8701 . .	6.5	3	III-VII	87 50 2.1	0.2	7.1	4.9	3.9	3.2	3.57	31.025	. .	30.461
	43	Lacaille 8758 . .	6.5	3	III-VII	90 9 59.3	58.0	64.6	61.4	62.2	60.6	61.02	36.434	. .	35.871
	44	B. A. C. 7422 . .	7.0	3	III-VII	85 0 5.0	1.3	11.6	9.3	9.2	6.6	7.17	36.130	. .	35.566
	45	B. A. C. 7463 . .	6.0	3	III-VII	78 35 3.3	1.8	10.7	8.8	7.8	6.7	6.52	33.758	. .	33.192
	46	Lacaille 8867 . .	6.2	3	III-VII	93 5 4.3	4.0	10.0	10.1	7.5	6.4	7.05	31.198	. .	30.635
	47	θ Piscis Australis . .	5.5	3	III-VII	90 20 2.7	2.3	8.5	5.5	6.2	3.8	4.83	31.883	. .	31.320
	48	Lacaille 8965 . .	6.5	3	III-VII	90 5 0.2	59.6	6.1	3.8	3.1	1.3	2.35	35.151	. .	34.588
	49	Lacaille 9004 . .	6.8	3	III-VII	89 20 2.0	0.3	7.1	4.5	4.3	3.5	3.62	28.149	. .	27.586
	50	B. A. C. 7729 . .	6.8	3	III-VII	86 35 1.8	59.9	7.4	6.2	5.3	3.9	4.08	26.494	. .	25.930
	51	Lacaille 9091 . .	7.0	3	III-VII	96 5 2.8	3.1	10.0	8.0	7.8	5.5	6.20	35.028	. .	34.466
	52	Nadir	. .	.	. .	200 0 4.8	3.1	10.8	11.1	7.4	8.5	7.62	30.666	. .	. .
21	53	B. A. C. 6377 . .	6.5	3	III-VII	88 35 2.0	0.7	7.0	4.2	5.6	4.6	4.02	26.947	−0.542	26.410
	54	33 Sagittarii	6.0	3	III-VII	80 25 2.3	0.4	7.8	6.1	6.2	4.6	4.57	35.159	. .	34.621
	55	B. A. C. 7955 . .	7.0	3	III-VII	95 55 0.6	59.7	6.7	5.1	4.7	2.4	3.20	32.936	. .	32.401
	56	α Coronæ Australis .	4.5	3	III-VII	96 55 0.0	59.6	6.4	3.9	4.2	2.3	2.73	29.634	. .	29.100
	57	Anon. $19^h\ 8^m\ 40^s$.	7.0	3	III-VII	91 0 2.2	0.9	7.1	4.8	5.4	3.2	3.93	36.212	. .	35.676
	58	Lacaille 8090 . .	7.0	3	III-VII	94 5 2.9	1.2	8.9	7.0	7.4	4.4	5.30	35.118	. .	34.583
	59	Lacaille 8128 . .	7.5	3	III-VII	95 5 2.2	0.2	8.1	6.0	6.3	3.7	4.42	33.872	. .	33.337
	60	Lacaille 8186 . .	. .	3	III-VII	95 45 2.5	1.4	8.8	7.0	7.8	4.3	5.30	30.297	. .	29.762
	61	O. Arg. S. 19978 .	6.5	3	III-VII	88 0 2.2	59.3	6.0	5.0	4.7	3.3	3.42	36.411	. .	35.874
	62	*b* Sagittarii	5.0	3	III-VII	86 20 3.3	1.8	10.5	8.8	7.8	5.7	6.32	28.035	. .	27.498
	63	O. Arg. S. 20200 .	7.0	3	III-VII	81 25 2.2	0.2	6.9	5.4	4.8	3.2	3.78	32.264	. .	31.726
	64	Nadir	. .	.	. .	199 59 59.4	58.7	65.9	65.0	62.7	62.4	62.35	30.467	−0.542	. .

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	− 1 26.9	S. 68 18 36.8	2 21.1	− 29 27 19.1	+ 6.6	Y.	
2	. .	. .	. .	− 36.0	57 24 29.5	1 28.3	− 18 32 19.0	+ 2.4	Y.	
3	30.236	71.7	67.7	− 1 19.3	69 28 47.4	2 30.0	− 30 37 38.6	+ 5.4	Y.	
4	. .	. .	. .	+ 16.6	75 45 19.1	3 39.2	− 36 55 19.5	+ 6.5	Y.	
5	. .	. .	. .	+ 20.3	66 15 24.8	2 8.2	− 27 23 54.2	+ 2.7	Y.	
6	. .	. .	66.7	− 2 56.6	76 52 9.3	3 58.1	− 38 2 28.6	+ 5.1	Y.	
7	. .	. .	. .	+ 57.3	74 50 59.6	3 26.4	− 36 0 47.2	+ 3.8	Y.	
8	. .	. .	. .	− 44.8	69 14 16.7	2 28.6	− 30 23 6.5	+ 1.3	Y.	
9	30.222	70.5	65.9	− 1 59.3	72 52 59.5	3 2.2	− 34 2 22.9	+ 1.3	Y.	
10	. .	. .	. .	− 5.1	69 45 0.7	2 32.8	− 20 53 54.7	− 0.4	Y.	
11	. .	. .	. .	− 2 32.7	67 17 34.3	2 15.0	− 28 26 10.5	− 1.8	Y.	
12	. .	. .	. .	− 1 59.1	S. 44 58 6.3	56.8	− 6 5 24.3	− 8.3	Y.	
13	30.216	70.0	65.0	− 25.1	N. 8 15 17.1	8.3	+ 47 9 4.2	− 16.3	Y.	
14	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
15	. .	. .	. .	− 29.4	S. 39 49 37.4	47.5	− 0 56 46.1	− 12.6	Y.	
16	30.214	69.2	63.7	− 1 50.6	67 33 12.9	2 17.2	− 28 41 51.3	− 8.3	Y.	
17	. .	. .	. .	− 23.3	70 4 39.6	2 36.1	− 31 13 36.9	− 9.0	Y.	
18	. .	. .	. .	+ 1 20.8	69 21 21.1	2 30.3	− 30 30 12.6	− 9.7	Y.	
19	30.206	69.0	63.3	+ 2 11.2	66 37 14.6	2 11.2	− 27 45 47.0	− 11.1	Y.	
20	29.646	71.2	68.5	− 14.6	67 19 47.8	2 11.9	− 28 28 20.9	+ 11.2	Y.	
21	. .	. .	. .	+ 2.0	63 50 5.6	1 52.4	− 24 58 19.2	+ 9.1	Y.	
22	29.652	71.5	68.1	− 2 51.4	62 12 55.3	1 44.9	− 23 21 1.4	+ 8.0	Y.	
23	. .	. .	. .	− 2 15.6	48 2 52.3	1 1.7	− 9 10 15.2	+ 2.4	Y.	
24	29.656	71.0	67.8	+ 3.3	76 20 9.5	3 44.0	− 37 30 14.7	+ 10.9	Y.	
25	29.664	71.0	68.0	+ 1 33.8	64 16 38.1	1 54.7	− 25 24 54.0	+ 6.1	Y.	
26	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
27	. .	. .	. .	− 2 16.3	48 2 49.8	1 3.6	− 9 10 14.6	+ 2.5	Y.	
28	29.948	63.7	57.5	− 2 10.6	68 22 54.0	2 23.5	− 29 31 38.7	+ 8.8	Y.	
29	. .	. .	. .	+ 22.5	42 45 26.7	52.9	− 3 52 40.8	− 0.8	Y.	
30	. .	. .	. .	− 1 30.8	68 18 35.4	2 23.1	− 29 27 19.7	+ 7.0	Y.	
31	29.960	63.3	55.7	+ 37.9	72 20 40.3	2 58.3	− 33 29 59.8	+ 8.0	Y.	
32	. .	. .	. .	− 35.0	19 14 29.1	20.0	+ 19 38 49.7	− 9.1	Y.	
33	. .	. .	. .	− 1 23.2	71 48 43.6	2 53.0	− 32 57 57.8	+ 6.3	Y.	
34	. .	. .	. .	− 2 57.2	55 17 10.4	1 22.8	− 16 24 54.4	+ 0.3	Y.	
35	29.970	62.8	56.1	− 1 50.4	65 53 15.0	2 7.7	− 27 1 43.9	+ 3.1	Y.	
36	. .	. .	. .	+ 1 43.2	71 21 45.9	2 48.7	− 32 30 55.8	+ 3.9	Y.	
37	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
38	29.982	62.2	56.2	− 57.7	65 49 8.8	2 7.3	− 26 57 37.3	− 0.2	Y.	
39	. .	. .	. .	− 2 24.7	80 27 41.5	5 29.2	− 41 39 31.9	+ 3.0	Y.	
40	. .	. .	. .	− 16.3	60 49 52.0	1 42.7	− 21 57 55.9	− 3.6	Y.	
41	. .	. .	. .	− 2 9.1	58 7 58.9	1 32.5	− 19 15 52.6	− 5.1	Y.	
42	30.000	62.0	54.3	− 14.4	67 49 49.1	2 20.7	− 28 58 31.0	− 3.9	Y.	
43	. .	. .	. .	− 3 4.0	70 6 57.0	2 38.3	− 31 15 56.5	− 4.1	Y.	
44	. .	. .	. .	− 2 54.5	64 57 12.7	2 3.0	− 26 5 36.9	− 6.1	Y.	
45	. .	. .	. .	− 1 40.0	58 33 26.5	1 34.3	− 19 41 22.0	− 8.2	Y.	
46	30.000	61.5	53.4	− 19.9	73 4 47.1	3 7.8	− 34 14 16.1	− 5.7	Y.	
47	. .	. .	. .	− 41.4	70 19 23.5	2 40.4	− 31 28 25.1	− 7.2	Y.	
48	. .	. .	. .	− 2 23.8	70 2 38.6	2 38.1	− 31 11 37.9	− 8.1	Y.	
49	. .	. .	. .	+ 1 15.7	69 21 19.3	2 32.5	− 30 30 13.0	− 8.9	Y.	
50	30.006	60.8	52.6	+ 2 7.5	66 37 11.6	2 13.2	− 27 45 46.0	− 10.5	Y.	
51	. .	. .	. .	− 2 20.0	76 2 46.2	3 49.0	− 37 12 56.4	− 9.3	Y.	
52	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	
53	30.120	60.2	53.8	+ 1 52.5	68 36 56.5	2 27.1	− 29 45 44.8	+ 9.3	Y.	
54	. .	. .	. .	− 2 24.8	60 22 39.8	1 44.1	− 21 30 45.1	+ 5.9	Y.	
55	. .	. .	. .	− 1 15.3	75 53 47.9	3 47.1	− 37 3 56.2	+ 10.7	Y.	
56	30.114	60.0	52.8	+ 28.2	76 55 30.9	4 5.1	− 38 5 57.2	+ 10.5	Y.	
57	. .	. .	. .	− 2 57.9	70 57 6.0	2 46.9	− 32 6 14.1	+ 7.8	Y.	
58	. .	. .	. .	− 2 23.6	74 2 41.7	3 20.8	− 35 12 23.7	+ 8.2	Y.	
59	30.120	59.8	52.0	− 1 44.6	75 3 19.8	3 34.7	− 36 13 15.7	+ 7.9	Y.	
60	. .	. .	. .	+ 7.5	75 45 12.8	3 45.4	− 36 55 19.4	+ 7.2	Y.	
61	. .	. .	. .	− 3 4.1	67 56 59.3	2 22.9	− 29 5 43.4	+ 4.0	Y.	
62	. .	. .	. .	+ 1 18.4	66 21 24.8	2 12.3	− 27 29 58.3	+ 2.8	Y.	
63	30.120	59.0	51.5	− 54.1	S. 61 24 9.7	1 46.5	− 22 32 17.4	+ 0.5	Y.	
64	. .	. .	. .	. .	. . . .	. .	. . .	. .	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. Sept. 23	1	B. A. C. 7021	7.0	3	III–VII	85 50 0.0	59.0	6.0	5.4	3.8	1.5	2.62	32.289	−0.534	31.760
	2	B. A. C. 7114	6.5	3	III–VII	18 15 0.0	59.1	6.1	5.0	4.6	1.7	2.75	33.880	. .	33.338
	3	Lacaille 8546	7.2	3	III–VII	89 45 3.7	3.2	7.8	7.9	6.6	5.1	5.72	27.441	. .	26.913
	4	O. Arg. S. 20906	7.0	3	III–VII	90 0 2.3	2.2	6.0	5.2	4.2	4.0	3.98	29.212	. .	28.684
	5	Lacaille 8610	6.5	1	V	“ “ “	“	“	“	“	“	“	26.384	. .	25.850
	6	η Capricorni	5.0	3	III–VII	79 15 2.2	2.2	7.9	6.0	5.8	4.9	4.83	34.958	. .	34.428
	7	Lacaille 8707	6.5	3	III–VII	89 5 3.2	2.8	7.3	6.2	6.8	5.8	5.35	31.383	. .	30.855
	8	O. Arg. S. 21286	6.5	3	III–VII	88 10 4.8	3.8	8.4	7.9	6.8	7.1	6.47	33.812	. .	33.283
	9	Lacaille 8821	7.0	3	III–VII	87 10 2.7	0.9	8.2	8.3	5.6	5.6	5.22	35.931	. .	35.402
	10	7 Piscis Australis	6.0	3	III–VII	92 25 4.0	3.8	8.7	8.8	6.4	6.2	6.32	27.239	. .	26.711
	11	Lacaille 8911	6.5	3	III–VII	92 10 2.3	1.7	8.1	8.9	4.8	5.1	5.15	34.827	. .	34.299
	12	B. A. C. 7632	6.0	3	III–VII	96 40 3.9	5.9	11.2	11.2	9.0	7.9	8.18	30.483	. .	29.956
	13	λ Gruis	5.0	3	III–VII	98 59 59.1	59.8	64.1	62.8	62.3	61.0	61.52	35.630	. .	35.104
	14	39 Aquarii	5.5	3	III–VII	73 40 1.2	59.0	7.0	7.3	5.3	3.4	3.87	29.517	. .	28.986
	15	45 Aquarii	6.0	3	III–VII	72 49 59.3	58.9	64.8	65.9	62.9	62.2	62.33	34.620	. .	34.088
	16	Lacaille 9135	6.5	3	III–VII	85 55 1.9	0.2	7.4	8.9	4.7	3.3	4.40	31.605	. .	31.076
	17	60 Aquarii	5.5	3	III–VII	61 5 1.0	59.2	5.0	7.6	2.7	3.6	3.18	29.638	. .	29.104
	18	19 Piscis Australis	. .	3	III–VII	88 50 0.7	59.5	5.0	6.0	2.2	3.9	2.88	27.357	. .	26.829
	19	Lacaille 9292	7.5	3	III–VII	98 55 4.0	4.9	9.3	9.9	7.8	5.7	6.93	33.392	−0.534	32.866
	20	α Ursæ Majoris, S. P.	. .	2	V, VI	301 25 5.1	4.7	11.7	8.9	9.2	5.1	7.45	32.909	−0.234	32.679
	21	59 Pegasi	5.5	3	III–VII	50 49 59.2	60.2	65.3	65.4	62.6	63.7	62.73	30.209	−0.534	29.674
	22	Lacaille 9447	7.5	3	III–VII	82 20 1.2	1.2	6.7	7.2	3.1	2.1	3.58	27.105	. .	26.575
	23	B. A. C. 8172	6.5	3	III–VII	95 5 0.0	59.8	6.7	7.0	2.8	1.6	2.98	33.152	. .	32.625
	24	Nadir	. .	.	. .	200 0 3.2	3.7	9.8	9.4	5.0	6.0	6.18	30.581	. .	. .
24	25	B. A. C. 6377	6.0	3	III–VII	88 40 1.6	0.0	4.9	1.9	5.2	4.4	3.00	36.453	−0.511	35.948
	26	B. A. C. 6447	6.0	3	III–VII	75 24 59.0	56.9	65.0	62.8	64.1	62.4	61.70	32.656	. .	32.148
	27	O. Arg. S. 18847	7.5	2	VII, IX	“ “ “	“	“	“	“	“	“	35.165	. .	34.657
	28	B. A. C. 6515	6.8	3	III–VII	86 20 1.7	0.2	7.2	5.3	6.6	5.2	4.37	30.640	. .	30.134
	29	Anon. 19h 6m 25s	7.5	3	III–VII	88 20 0.0	57.0	2.8	0.3	2.6	2.1	0.80	29.763	. .	29.257
	30	B. A. C. 6569	7.0	2	VII, IX	“ “ “	“	“	“	“	“	“	33.345	. .	32.846
	31	χ¹ Sagittarii	5.5	3	III–VII	83 35 1.6	59.4	5.7	3.8	5.2	3.9	3.27	27.331	. .	26.824
	32	B. A. C. 6684	6.5	3	III–VII	89 30 2.9	1.2	6.1	4.9	6.2	4.9	4.37	33.080	. .	32.575
	33	O. Arg. S. 19845	7.3	3	III–VII	86 50 2.5	0.2	7.7	6.6	8.2	6.1	5.22	30.101	. .	29.595
	34	O. Arg. S. 19978	6.0	3	III–VII	88 0 3.4	0.7	7.0	5.9	7.7	5.3	5.00	36.434	. .	35.928
	35	Lacaille 8278	6.5	3	III–VII	95 50 5.1	4.7	10.4	8.7	11.1	9.2	8.20	28.849	. .	28.345
	36	B. A. C. 6877	5.5	3	III–VII	91 15 4.6	4.3	9.2	7.4	9.2	6.2	6.82	30.394	. .	29.889
	37	Lacaille 8385	6.3	3	III–VII	95 40 0.3	0.8	5.9	4.0	5.5	2.5	3.17	30.660	. .	30.156
	38	Lacaille 8418	6.7	3	III–VII	94 34 59.6	59.1	65.0	63.9	65.2	62.2	62.50	27.450	. .	26.946
	39	ρ Capricorni	5.5	3	III–VII	77 5 2.1	0.8	7.8	5.5	8.3	5.1	4.93	29.513	. .	29.005
	40	ζ Delphini	4.5	3	III–VII	44 40 3.8	1.3	8.3	6.0	8.3	6.0	5.62	33.919	. .	33.406
	41	B. A. C. 7172	7.0	3	III–VII	63 15 0.7	58.7	4.0	3.7	3.8	3.3	2.37	31.612	. .	31.102
	42	β Microscopii	6.0	3	III–VII	92 30 1.8	1.2	7.1	5.6	5.9	3.7	4.22	32.145	. .	31.640
	43	Lalande 8630	6.5	3	III–VII	95 25 2.3	2.5	7.3	6.9	7.4	4.8	5.20	27.586	. .	27.082
	44	Lacaille 8635	7.0	2	VII, IX	“ “ “	“	“	“	“	“	“	35.538	. .	35.044
	45	Anon. 21h 1m 59s	7.0	3	III–VII	83 0 4.2	3.8	9.7	10.0	9.2	6.7	7.27	31.672	. .	31.165
	46	φ Capricorni	5.5	3	III–VII	80 0 1.0	1.4	6.7	6.0	6.8	4.0	4.32	26.820	. .	26.313
	47	Lacaille 8790	7.0	3	III–VII	88 50 3.0	2.3	7.1	6.0	8.1	6.8	5.55	32.519	. .	32.014
	48	Lacaille 8834	6.8	3	III–VII	85 5 2.7	1.3	9.2	7.8	9.2	6.2	6.07	27.125	. .	26.619
	49	d Aquarii	. .	3	III–VII	57 10 oblit.	3.6	9.4	8.9	11.2	9.9	7.46	27.502	. .	26.991
	50	θ Piscis Australis	5.5	3	III–VII	90 20 2.1	2.8	7.1	7.4	6.7	4.9	5.17	31.922	. .	31.417
	51	B. A. C. 7682	5.5	3	III–VII	96 40 4.2	5.6	12.1	10.9	11.3	8.2	8.72	30.451	. .	29.947
	52	Lacaille 9000	6.5	3	III–VII	91 35 0.2	0.4	5.1	3.8	4.2	2.1	2.63	31.074	. .	30.569
	53	B. A. C. 7715	6.0	3	III–VII	87 45 1.8	2.1	6.9	6.4	6.2	3.7	4.52	29.812	. .	29.306
	54	B. A. C. 7768	5.8	3	III–VII	85 25 0.5	59.8	5.2	6.5	4.7	3.8	3.42	35.409	. .	34.903
	55	Lacaille 9127	6.8	3	III–VII	86 20 1.8	3.2	8.9	8.6	8.2	6.0	6.12	29.344	. .	28.838
	56	Nadir	. .	.	. .	199 59 59.6	58.4	64.6	64.1	63.4	62.7	62.13	30.430	. .	. .
27	57	B. A. C. 6447	6.0	3	III–VII	75 25 4.3	1.2	9.0	7.5	6.4	6.9	5.88	32.734	−0.540	32.197
	58	O. Arg. S. 18847	7.5	2	VII, IX	“ “ “	“	“	“	“	“	“	35.229	. .	34.692
	59	B. A. C. 6525	. .	3	III–VII	87 40 0.1	56.1	2.2	0.1	2.2	2.0	0.45	28.377	. .	27.842
	60	Lacaille 8060	7.0	3	III–VII	92 15 2.0	58.6	4.9	3.3	3.3	3.2	2.55	33.906	. .	33.372
	61	Anon. 19h 10m 59s	6.8	3	V–IX	“ “ “	“	“	“	“	“	“	32.881	. .	32.351
	62	B. A. C. 6663	6.5	3	III–VII	39 15 2.1	57.8	4.6	2.8	5.8	6.1	3.20	31.611	. .	31.068
	63	Lacaille 8159	. .	3	III–VII	91 50 4.2	1.8	8.2	5.2	7.7	7.0	5.68	33.051	. .	32.517
	64	Lacaille 8197	6.7	3	III–VII	100 45 1.7	57.4	4.0	1.1	2.8	3.1	1.68	35.474	. .	34.943
	65	B. A. C. 6795	7.0	3	IV–VI	86 15 0.6	58.5	4.5	4.8	3.8	3.9	2.68	29.835	−0.540	29.297

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	30.340	61.0	53.1	− 55.2	S. 65 49 7.5	2 9.6	− 26 57 38.3	+ 0.1	Y.	
2	. .	. .	. .	− 1 44.6	N. 1 46 41.9	1.8	+ 40 40 22.5	− 16.5	Y.	
3	. .	. .	. .	+ 1 36.8	S. 69 46 42.5	2 37.8	− 30 55 41.5	− 0.6	Y.	
4	. .	. .	. .	+ 41.2	70 0 45.2	2 39.8	− 31 9 46.2	− 1.2	Y.	
5	30.344	60.2	51.9	+ 2 10.1	70 2 14.0	2 40.2	− 31 11 15.4	− 1.3	Y.	
6	. .	. .	. .	− 2 18.8	59 12 46.0	1 38.3	− 20 20 45.5	− 5.5	Y.	
7	. .	. .	. .	− 26.8	69 4 38.6	2 32.6	− 30 13 32.4	− 3.3	Y.	
8	. .	. .	. .	− 1 42.9	68 8 23.6	2 25.6	− 29 17 10.4	− 4.4	Y.	
9	30.344	58.8	50.1	− 2 49.3	67 7 15.9	2 18.7	− 28 15 55.8	− 5.6	Y.	
10	. .	. .	. .	+ 1 43.1	72 26 49.4	3 4.2	− 33 36 14.8	− 5.1	Y.	
11	. .	. .	. .	− 2 14.7	72 7 50.4	3 0.9	− 33 17 12.5	− 6.2	Y.	
12	30.336	57.6	49.4	+ 1.4	76 40 9.6	4 3.9	− 37 50 34.7	− 6.2	Y.	
13	. .	. .	. .	− 2 40.0	78 57 21.6	4 53.7	− 40 8 36.5	− 6.8	Y.	
14	. .	. .	. .	+ 31.8	53 40 35.6	1 20.1	− 14 48 16.9	− 12.8	Y.	
15	. .	. .	. .	− 2 8.1	52 47 54.2	1 17.7	− 13 55 33.1	− 13.1	Y.	
16	. .	. .	. .	− 33.7	65 54 30.7	2 11.4	− 27 3 3.3	− 11.8	Y.	
17	. .	. .	. .	+ 28.1	41 5 31.2	51.5	− 2 12 43.9	− 16.5	Y.	
18	30.340	56.0	48.0	+ 1 39.4	68 51 42.2	2 31.8	− 30 0 35.2	− 12.7	Y.	
19	. .	. .	47.6	− 1 29.8	S. 78 53 37.1	4 53.0	− 40 4 51.3	− 12.0	Y.	
20	. .	. .	. .	− 1 24.0	N. 78 36 16.5	4 45.9	+ 62 25 18.8	+ 11.3	Y.	North wire.
21	. .	. .	. .	+ 10.2	S. 30 50 13.0	35.4	+ 8 2 50.4	− 19.6	Y.	
22	. .	. .	. .	+ 1 47.3	62 21 50.9	1 52.7	− 23 30 4.8	− 17.1	Y.	
23	30.334	54.5	47.0	− 1 22.3	75 3 40.7	3 38.6	− 36 13 40.5	− 16.2	Y.	
24	. .	. .	. .	. .	. . . . .	. .	. . . . .	. .	Y.	
25	30.264	62.0	55.7	− 3 6.4	68 36 56.6	2 27.2	− 29 45 45.0	+ 9.4	Y.	
26	. .	. .	. .	− 1 7.3	55 23 54.4	1 24.1	− 16 31 39.7	+ 4.0	Y.	
27	. .	. .	. .	− 2 26.0	55 22 35.7	1 24.0	− 16 30 20.9	+ 4.0	Y.	
28	. .	. .	. .	− 4.2	66 20 0.2	2 11.8	− 27 28 33.2	+ 7.1	Y.	
29	. .	. .	. .	+ 23.3	68 20 24.1	2 25.4	− 29 29 10.7	+ 7.2	Y.	
30	30.254	61.5	54.7	− 1 29.2	68 18 31.6	2 25.2	− 29 27 18.0	+ 7.2	Y.	
31	. .	. .	. .	+ 1 39.5	63 36 42.8	1 56.8	− 24 45 0.8	+ 4.7	Y.	
32	. .	. .	. .	− 1 20.7	69 28 43.6	2 34.5	− 30 37 39.3	+ 6.0	Y.	
33	30.268	61.0	53.5	+ 12.7	66 50 17.9	2 15.5	− 27 58 54.6	+ 4.5	Y.	
34	. .	. .	. .	− 3 5.8	67 56 59.2	2 23.1	− 29 5 43.5	+ 4.1	Y.	
35	. .	. .	. .	+ 51.9	75 51 0.1	3 47.5	− 37 1 8.8	+ 6.0	Y.	
36	30.260	60.5	53.0	+ 3.5	71 15 10.3	2 50.3	− 32 24 21.8	+ 3.9	Y.	
37	. .	. .	. .	− 4.9	75 39 58.3	3 44.6	− 36 50 4.1	+ 4.2	Y.	
38	. .	. .	. .	+ 1 35.7	74 36 38.2	3 29.2	− 35 46 28.6	+ 3.2	Y.	
39	. .	. .	. .	+ 31.2	57 5 36.1	1 30.1	− 18 13 27.4	− 2.9	Y.	
40	. .	. .	. .	− 1 46.8	24 38 18.9	26.8	+ 14 14 53.1	− 12.2	Y.	
41	. .	. .	. .	− 34.5	43 14 27.8	55.0	− 4 21 44.0	− 8.1	Y.	
42	30.266	59.5	52.0	− 51.4	72 29 12.8	3 3.3	− 33 38 37.3	− 0.4	Y.	
43	. .	. .	. .	+ 1 31.4	75 26 36.6	3 41.7	− 36 36 39.5	− 0.3	Y.	
44	. .	. .	. .	− 2 38.1	75 22 27.1	3 41.7	− 36 32 30.0	− 0.5	Y.	
45	. .	. .	. .	− 36.5	62 59 30.8	1 54.4	− 24 7 46.4	− 4.8	Y.	
46	. .	. .	. .	+ 1 55.6	60 1 59.9	1 41.3	− 21 10 2.4	− 6.2	Y.	
47	30.266	58.7	51.0	− 1 3.1	68 49 2.4	2 30.2	− 29 57 53.8	− 4.5	Y.	
48	. .	. .	. .	+ 1 46.0	65 6 52.0	2 5.8	− 26 15 19.0	− 6.3	Y.	
49	. .	. .	. .	+ 1 34.3	37 11 41.7	44.5	+ 1 41 12.6	− 13.6	Y.	−0″.81 applied to mean of B, C, D, and E.
50	30.260	58.0	50.8	− 44.4	70 19 20.8	2 42.6	− 31 28 24.6	− 6.7	Y.	
51	. .	. .	. .	+ 1.7	76 40 10.4	4 2.7	− 37 50 34.3	− 6.1	Y.	
52	. .	. .	. .	− 17.9	71 34 44.8	2 54.4	− 32 44 0.4	− 7.9	Y.	
53	. .	. .	. .	+ 21.8	67 45 26.3	2 22.6	− 28 54 10.1	− 9.5	Y.	
54	. .	. .	. .	− 2 33.7	65 22 29.8	2 7.5	− 26 30 58.5	− 10.7	Y.	
55	30.258	57.5	49.8	+ 36.4	66 20 42.5	2 13.4	− 27 29 17.1	− 11.3	Y.	
56	. .	. .	. .	. .	. . . .	. .	. . . . .	. .	Y.	
57	. .	. .	. .	− 1 8.8	55 23 57.0	1 22.5	− 16 31 40.7	+ 3.9	Y.	
58	29.976	65.0	59.8	− 2 27.0	55 22 38.8	1 22.5	− 16 30 22.5	+ 3.9	Y	
59	. .	. .	. .	+ 1 7.6	67 41 8.1	2 18.2	− 28 49 47.5	+ 7.5	Y.	
60	. .	. .	. .	− 1 45.7	72 13 16.9	2 56.3	− 33 22 34.4	+ 8.2	Y.	
61	29.986	64.5	58.4	− 1 13.7	72 13 48.9	2 56.6	− 33 23 6.7	+ 8.2	Y.	
62	. .	. .	. .	− 33.5	19 14 29.7	20.0	+ 19 38 49.1	− 9.5	Y.	
63	. .	. .	. .	− 1 18.9	71 48 46.5	2 52.6	− 32 58 0.6	+ 6.6	Y.	
64	29.994	64.0	57.5	− 2 34.9	80 42 26.8	5 36.5	− 41 54 24.5	+ 8.9	Y.	
65	. .	. .	. .	+ 22.0	S. 66 15 24.7	2 9.7	− 27 23 55.6	+ 3.4	Y.	

DATE.	Number.	OBJECT.	Magnitude.	No. of mic. readings.	Transit Wires.	MICROSCOPES.							MICROMETER.		
						A.	B.	C.	D.	E.	F.	Mean.	Observed.	Nadir cor.	Corr'd.
						° ′ ″	″	″	″	″	″	″	r.	r.	r.
1875. Sept. 27	1	Lacaille 8300	7.0	3	III–VII	97 45 4.2	2.4	7.8	6.0	6.8	7.2	5.73	30.769	−0.540	30.237
	2	B. A. C. 6907	6.3	3	III–VII	74 15 4.0	1.7	8.1	7.7	7.7	6.9	6.02	29.578	. .	29.041
	3	Lacaille 8399	7.0	3	III–VII	92 0 0.0	58.3	3.9	1.9	2.8	2.0	1.48	34.472	. .	33.938
	4	Anon. 20^h 13^m 23^s	7.3	3	III–VII	" " "	"	"	"	"	"	"	33.267	. .	32.733
	5	Lacaille 8476	6.8	3	III–VII	90 40 1.4	59.7	4.9	3.8	3.3	3.0	2.68	32.203	. .	31.669
	6	B. A. C. 7155	6.0	3	III–VII	98 50 3.3	2.5	6.1	5.0	6.4	4.9	4.70	32.169	. .	31.637
	7	Lacaille 8587	6.5	3	III–VII	91 19 59.2	58.7	63.4	60.8	61.7	61.2	60.83	27.093	. .	26.559
	8	B. A. C. 7263	5.8	3	III–VII	75 25 4.8	2.6	11.4	9.9	8.2	7.4	7.38	34.902	. .	34.365
	9	Lacaille 8697	6.5	3	III–VII	97 15 1.9	0.9	6.8	4.4	4.7	3.9	3.77	29.261	. .	28.729
	10	φ Capricorni	5.5	3	III–VII	80 0 1.7	0.4	6.6	4.1	5.4	4.9	3.85	26.777	. .	26.241
	11	B. A. C. 7419	6.2	3	III–VII	84 35 2.8	1.8	8.2	7.1	7.2	6.4	5.58	29.390	. .	28.855
	12	B. A. C. 7479	6.3	3	III–VII	84 0 6.5	5.1	11.8	11.2	10.2	10.0	9.13	30.763	. .	30.228
	13	Anon. 21^h 34^m 15^s	6.5	3	III–VII	91 55 1.2	0.8	6.2	3.8	4.4	3.9	3.38	27.995	. .	27.461
	14	Lacaille 8889	7.0	2	VII, IX	" " "	"	"	"	"	"	"	30.394	. .	29.868
	15	Lacaille 8965	6.5	3	III–VII	90 5 0.0	57.8	4.7	2.1	2.4	2.3	1.55	35.019	. .	34.485
	16	Lacaille 9004	7.0	3	III–VII	89 20 3.0	1.7	7.1	5.9	5.2	5.2	4.68	28.071	. .	27.537
	17	B. A. C. 7715	6.0	3	III–VII	87 45 6.1	4.7	10.1	9.7	8.6	8.8	8.00	29.837	. .	29.302
	18	Lacaille 9091	7.0	3	III–VII	96 5 0.3	0.8	6.8	6.0	5.6	3.8	3.88	34.727	. .	34.194
	19	Lacaille 9119	6.6	3	III–VII	98 35 4.4	3.7	9.1	6.9	7.4	5.9	6.23	31.837	. .	31.305
	20	Lacaille 9167	6.5	3	III–VII	94 40 0.0	58.8	6.2	5.3	4.2	2.6	2.85	36.564	. .	36.031
	21	Nadir	. .	.	. .	200 0 1.1	59.2	6.5	4.9	2.3	4.0	3.00	30.486	. .	. .
28	22	Weisse XXI, 1139	. .	3	III–VII	64 15 5.7	2.1	8.9	7.5	8.4	7.9	6.75	33.867	−0.543	33.325
	23	B. A. C. 7768	6.0	3	III–VII	85 25 3.2	59.8	7.4	5.0	6.6	5.7	4.62	35.323	. .	34.785
	24	32 Aquarii	. .	3	V–IX	60 25 2.2	58.2	5.8	3.2	6.4	6.6	3.73	34.139	. .	33.593
	25	37 Pegasi	. .	3	III–VII	55 5 6.1	2.9	10.2	9.8	11.8	9.2	8.33	31.142	. .	30.598
	26	Nadir	. .	.	. .	200 0 3.4	59.4	8.0	4.4	6.3	6.7	4.70	30.543	. .	. .
29	27	B. A. C. 6413	5.5	3	III–VII	88 25 0.8	55.4	2.9	58.7	2.2	3.2	0.53	34.484	−0.562	33.927
	28	B. A. C. 6531	. .	3	III–VII	84 45 1.6	56.7	5.9	1.9	4.2	5.1	2.57	29.843	. .	29.286
	29	Lacaille 8041	7.0	3	III–VII	96 0 1.6	58.3	5.9	1.9	5.4	5.4	3.08	30.977	. .	30.422
	30	Lacaille 8077	6.5	3	III–VII	94 5 4.7	59.8	8.2	4.0	8.2	7.2	5.35	34.157	. .	33.602
	31	Anon. 19^h 21^m 29^s	6.7	3	III–VII	74 15 3.0	58.7	7.8	3.8	7.4	5.7	4.40	33.320	. .	32.761
	32	45 Aquilæ	. .	3	V–IX	59 45 2.6	57.2	5.5	1.0	5.2	6.3	2.97	26.195	. .	25.636
	33	Weisse XIX, 1068	7.0	3	III–VII	73 5 0.8	56.2	3.5	1.4	3.4	3.2	1.42	27.560	. .	27.000
	34	Lacaille 8278	6.8	3	III–VII	95 50 1.1	58.4	5.4	2.2	5.7	5.1	2.98	28.440	. .	27.885
	35	62 Aquilæ	5.8	3	III–VII	59 54 59.0	54.8	62.2	57.8	62.7	62.7	59.87	28.378	. .	27.816
	36	Lacaille 8385	6.2	3	III–VII	95 40 3.7	0.4	7.1	3.9	7.2	5.4	4.62	30.531	. .	29.976
	37	Lacaille 8418	6.7	3	III–VII	94 35 3.3	59.4	7.2	3.8	7.4	6.4	4.58	27.326	. .	26.771
	38	41 Cygni	4.5	3	III–VII	28 55 3.2	57.9	7.4	4.1	8.1	6.4	4.52	28.642	. .	28.074
	39	48 Cygni	6.0	3	III–VII	27 45 0.8	56.2	3.9	0.9	4.7	4.2	1.78	30.592	. .	30.024
	40	B. A. C. 7187	6.5	3	III–VII	85 45 4.3	59.0	8.7	4.9	9.2	6.1	5.37	33.079	. .	32.522
	41	B. A. C. 7248	6.5	3	III–VII	78 10 1.8	59.4	8.0	4.8	7.2	5.6	4.47	34.504	. .	33.945
	42	Lacaille 8677.	7.5	3	III–VII	95 35 0.7	57.5	4.7	59.8	3.9	2.6	1.53	29.922	. .	29.367
	43	Lacaille 8722.	7.2	3	III–VII	95 5 0.1	56.9	5.2	2.2	4.2	2.6	1.87	27.798	. .	27.243
	44	A Cygni	5.2	3	III–VII	15 30 3.6	0.2	7.9	3.4	7.2	5.3	4.60	34.253	. .	33.682
	45	5 Piscis Australis	6.3	3	III–VII	90 40 2.2	58.9	5.9	1.9	3.8	3.9	2.77	34.887	. .	34.331
	46	8 Piscis Australis	6.0	3	III–VII	85 35 6.1	1.3	10.6	8.0	9.8	8.2	7.33	30.556	. .	29.999
	47	Lacaille 8906	7.2	3	III–VII	88 10 2.8	59.8	5.8	3.3	5.5	5.7	3.82	32.540	. .	31.983
	48	Lacaille 8948	7.0	3	III–VII	96 19 59.4	56.8	64.1	61.2	63.7	63.6	61.47	33.259	. .	32.704
	49	Lacaille 9004	7.0	3	III–VII	89 20 4.5	1.3	8.2	4.2	7.4	6.8	5.40	28.095	. .	27.539
	50	B. A. C. 7729	6.3	3	III–VII	86 40 1.8	58.4	6.3	4.2	5.6	5.0	3.55	35.937	. .	35.380
	51	47 Aquarii	5.7	3	III–VII	81 5 4.3	2.5	9.1	6.8	7.7	7.1	6.25	30.442	. .	29.884
	52	Lacaille 9142	7.0	3	III–VII	81 35 1.6	58.4	5.9	2.9	3.8	3.2	2.63	32.222	. .	31.664
	53	B. A. C. 7872	6.5	2	I, IX	91 10 2.6	0.2	6.2	2.9	5.2	4.6	3.62	32.113	. .	31.582
	54	Piazzi XXII, 154	. .	3	III–VII.	" " "	"	"	"	"	"	"	34.524	. .	33.968
	55	Nadir	. .	.	. .	199 59 58.1	53.8	62.0	61.2	60.4	62.1	59.60	30.394	. .	. .
	56	Nadir	. .	.	. .	200 0 3.1	0.2	7.1	6.4	6.6	7.8	5.20	30.587	−0.562	. .

Number.	Barometer.	THERM'S.		Instrumental corrections.	Apparent Zenith Distance.	Refraction.	Observed Declination.	Reduction to 1875.0.	Observer.	REMARKS.
		At.	Ex.							
	in.	°	°	′ ″	° ′ ″	′ ″	° ′ ″	″		
1	. .	. .	. .	− 7.4	S. 77 44 58.3	4 18.1	− 38 55 37.6	+ 6.3	Y.	
2	. .	. .	. .	+ 30.1	54 15 36.1	1 19.7	− 15 23 17.0	− 2.0	Y.	
3	. .	. .	. .	− 2 3.5	71 57 58.1	2 54.6	− 33 7 13.9	+ 2.8	Y.	
4	. .	. .	. .	− 1 25.7	71 58 35.8	2 54.8	− 33 7 51.8	+ 2.7	Y.	
5	29.980	62.7	55.7	− 52.3	70 39 10.4	2 42.3	− 31 48 13.9	+ 1.1	Y.	
6	. .	. .	. .	− 51.3	78 49 13.4	4 43.0	− 40 0 17.6	+ 2.7	Y.	
7	. .	. .	. .	+ 1 47.9	71 21 48.7	2 49.0	− 32 30 58.9	− 0.4	Y.	
8	29.982	63.0	55.3	− 2 16.8	55 22 50.6	1 23.2	− 16 30 35.0	− 5.8	Y.	
9	. .	. .	. .	+ 39.8	77 15 43.6	4 9.2	− 38 26 14.0	− 0.5	Y.	
10	. .	. .	. .	+ 1 57.8	60 2 1.7	1 39.6	− 21 10 2.5	− 7.3	Y.	
11	. .	. .	. .	+ 35.9	64 35 41.5	2 0.8	− 25 44 3.5	− 5.6	Y.	
12	. .	. .	. .	− 7.2	64 0 2.0	1 57.7	− 25 8 20.9	− 6.6	Y.	
13	. .	. .	. .	+ 1 19.6	71 56 23.0	2 55.0	− 33 5 39.2	− 5.4	Y.	
14	29.976	61.0	54.3	+ 4.1	71 55 7.5	2 54.8	− 33 4 23.5	− 5.4	Y.	
15	. .	. .	. .	− 2 20.6	70 2 41.0	2 37.6	− 31 11 39.8	− 7.3	Y.	
16	. .	. .	. .	+ 1 17.2	69 21 21.9	2 32.0	− 30 30 15.1	− 8.2	Y.	
17	29.980	60.5	54.0	+ 21.9	67 45 29.9	2 20.2	− 28 54 11.3	− 9.3	Y.	
18	. .	. .	. .	− 2 11.4	76 2 52.4	3 48.1	− 37 13 1.7	− 8.2	Y.	
19	. .	. .	. .	− 40.9	78 34 25.3	4 37.8	− 39 45 24.3	− 8.2	Y.	
20	29.990	60.5	54.6	− 3 9.0	74 36 53.8	3 26.5	− 35 46 41.5	− 10.1	Y.	
21	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
22	30.080	65.5	59.4	− 1 44.2	44 13 22.5	55.7	− 5 20 39.4	− 13.5	Y.	
23	. .	. .	. .	− 2 30.0	65 22 34.6	2 4.5	− 26 31 0.3	− 10.5	Y.	
24	. .	. .	. .	− 1 52.6	40 23 11.1	48.8	− 1 30 21.1	− 14.9	Y.	
25	30.080	64.2	58.2	− 18.8	35 4 49.6	40.3	+ 3 48 8.9	− 17.5	Y.	
26	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
27	29.918	68.2	64.2	− 2 3.1	68 22 57.5	2 21.4	− 29 31 40.1	+ 8.8	Y.	
28	. .	. .	. .	+ 22.4	64 45 24.9	1 59.2	− 25 53 45.3	+ 6.4	Y.	
29	. .	. .	63.5	− 13.2	75 59 49.9	3 42.5	− 37 9 53.6	+ 9.8	Y.	
30	. .	. .	. .	− 1 52.9	74 3 12.4	3 15.1	− 35 12 48.7	+ 8.7	Y.	
31	29.916	67.6	63.2	− 1 26.5	54 13 37.9	1 18.3	− 15 21 17.4	+ 1.1	Y.	
32	. .	. .	. .	+ 2 16.8	39 47 19.7	47.1	− 0 54 28.0	− 4.6	Y.	
33	. .	. .	. .	+ 1 34.0	53 6 35.4	1 15.2	− 14 14 11.8	− 1.0	Y.	
34	. .	. .	63.0	+ 1 6.2	75 51 9.2	3 40.4	− 37 1 10.8	+ 6.2	Y.	
35	. .	. .	. .	+ 1 8.4	39 56 8.3	47.4	− 1 3 16.9	− 6.3	Y.	
36	. .	. .	. .	+ 0.8	75 40 5.4	3 37.9	− 36 50 4.4	− 4.4	Y.	
37	29.916	67.0	62.0	+ 1 41.2	74 36 45.8	3 22.9	− 35 46 29.9	+ 3.5	Y.	
38	. .	. .	. .	+ 1 0.4	8 56 4.9	8.9	+ 29 57 25.0	− 15.7	Y.	
39	. .	. .	. .	− 0.7	7 45 1.0	7.7	+ 31 8 30.1	− 16.3	Y.	
40	. .	. .	. .	− 1 19.1	65 43 46.3	2 5.3	− 26 52 12.8	− 1.7	Y.	
41	29.916	66.8	60.9	− 2 3.6	58 8 0.8	1 31.1	− 19 15 53.1	+ 4.8	Y.	
42	. .	. .	. .	+ 19.9	75 35 21.4	3 37.3	− 36 45 19.9	− 0.5	Y.	
43	. .	. .	. .	+ 1 26.4	S. 75 6 28.3	3 30.3	− 36 16 19.8	− 1.3	Y.	
44	. .	. .	. .	− 1 55.4	N. 4 31 50.8	4.5	+ 43 25 34.1	− 19.7	Y.	
45	29.910	66.0	60.2	− 2 15.7	S. 70 37 47.0	2 40.3	− 31 46 48.5	− 4.3	Y.	
46	. .	. .	. .	0.0	65 35 7.4	2 4.7	− 26 43 33.3	− 6.4	Y.	
47	. .	. .	. .	− 1 2.2	68 9 1.7	2 21.0	− 29 17 43.9	− 6.6	Y.	
48	. .	. .	. .	− 1 24.7	76 18 36.7	3 49.3	− 37 28 47.2	− 5.2	Y.	
49	. .	. .	. .	+ 1 17.1	69 21 22.5	2 30.0	− 30 30 13.7	− 8.0	Y.	
50	29.914	65.2	59.3	− 2 48.6	66 37 15.0	2 11.0	− 27 45 47.2	− 9.5	Y.	
51	. .	. .	. .	+ 3.6	61 5 9.9	1 42.8	− 22 13 13.9	− 11.8	Y.	
52	. .	. .	. .	− 52.2	61 34 10.5	1 44.9	− 22 42 16.6	− 12.3	Y.	
53	. .	. .	. .	− 49.6	71 9 14.0	2 45.2	− 32 18 20.4	− 11.0	Y.	
54	29.908	65.0	58.9	− 2 4.3	S. 71 7 59.3	2 45.2	− 32 17 5.7	− 11.0	Y.	
55	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	
56	. .	. .	. .	. .	. . . .	. .	. . . .	. .	Y.	

OBSERVATIONS

MADE WITH THE

XXVI-INCH EQUATORIAL.

1875.

OBSERVATIONS

MADE WITH

THE XXVI-INCH EQUATORIAL.

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.			Eye-piece.	Image.	Observer.	Remarks.
							Index.	Ver. I.	Ver. II.				
1875.		°	h. m.	r.	r.	h. m.	°	°	°				
Jan. 4	Satellite of NEPTUNE.	30	. .	. .	. .	7 20	224.2	. .	. .	5 A	1	Hn.	Clouded over suddenly. Satellite very hard to see and unsteady. Parallel, Ver. II, 357°.88 with eye-piece No. 1.
						28	226.0						
						34	224.2						
	Mean	. .	. .	. .	. .	7 27	224.8						
5	Satellite of NEPTUNE.	10	7 10	62.625	65.857	6 52	240.2	. .	. .	. .	. .	Hn.	Parallel, Ver. II, 357°.8. 5 A for angles; 6 A for distances. * Good. † Half-weight.
				.662	.793		239.4						
				.700	.833		239.8						
				.655*	.827		238.8						
			7 39	.635	.780†	7 2	238.7						
					.822								
	Mean	. .	7 24	62.655	65.822	6 57	239.4						
	TITANIA	30	. .	. .	. .	14 15	. .	232.5	. .	5 A	. .	Hn.	
								235.1					
								233.2					
						14 23		233.3					
	Mean	. .	. .	. .	. .	14 19		233.5					
	OBERON	10	. .	. .	. .	14 26	. .	254.2	. .	5 A	. .	Hn.	Parallel, 357°.9.
								254.9					
						14 40		254.4					
	Mean	. .	. .	. .	. .	14 33	. .	254.5					
11	Satellite of NEPTUNE.	20	9 8	62.687*	65.776	8 48	317.8	. .	. .	5 A	4	Hn.	Watch, 30^s slow. Parallel, 255°.5. * Too large, but clock stopped.
							318.1						
							319.1						
							318.4						
						55	317.4						
	Mean	. .	. .	. .	. .	8 52	318.2						
11	Nebula (nova). . .	. .	. .	. .	. .	. .	. .	. .	. .	3	. .	T.	In looking for ENCKE's Comet, found a *v* F, elongated nebula $\alpha = 23^h\ 11^m.4$ $\delta = + 3^\circ.59$. Tuttle.
22	Satellite of NEPTUNE.	30	. .	. .	. .	7 59	125.0	. .	. .	. .	. .	Hn.	Parallel 75°.3 (Index). Chron. corr. = -3^m. Satellite scarcely to be seen, and not at all with 5 A. * Good.
							125.6						
							126.5						
							125.2*						
						8 10	125.6						
	Mean	. .	. .	. .	. .	8 1	125.6						
25	Satellite of NEPTUNE.	210	7 48	62.537	66.180?	7 30	134.9	. .	. .	5 A	2	Hn.	Chron. corr. = -4^m. Air *very* transparent, but images unsteady.
				.587	65.906		135.0						
				.556	.850:		136.9						
			8 10	.562:	.940		134.1						
						40	134.3						
	Mean	. .	7 55	62.560	65.969	7 31	135.0						

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.			Eye-piece.	Image.	Observer.	Remarks.
							Index.	Ver. I.	Ver. II.				
1875.		°	h. m.	r.	r.	h. m.	°	°	°				
Jan. 26	Satellite of NEPTUNE .	190	8 23	92.862	. .	8 7	146.2*	. .	. .	5 A	. .	Hn.	Parallel = 73°.4 (Index). Wt. for dist., = 1. Wt. for position angle = 1. Satellite scarcely to be seen. * Poor. † Good.
			8 32	. .	95.057		145.9*						
						8 17	145.9†						
	Mean	. .	8 27	. .	. .	8 12	146.0						
	OBERON	180	11 9	59.589	68.988	10 27	. .	68.7	. .	6 A	. .	Hn.	Weight for distances = 3. Weight for position angle = 4.
				.562	.985			68.5					
			19	.610	69.072			66.5					
								67.8					
						35		68.0					
	Mean	. .	11 14	59.587	69.015	10 31	. .	67.9					
	TITANIA	250	10 38	62.367:	*66.241†	. .	. .	. .	353.8	6 A	. .	Hn.	Wt. of dist. = 2. Wt. of pos. angle = 4. TITANIA fainter than I have ever seen it. * Dist. requires to be multiplied by sec. 5°.7. Setting for distances, 78°.1, Ver. I. † Good.
				.279	.231	10 59			353.8				
					.330				353.9				
			10 56	.389	.118	11 4							
	Mean	. .	10 47	62.345	66.230	11 2	. .	. .	353.8				
Feb. 1	Satellite of NEPTUNE .	. .	. .	. .	. .	7 44	169.3*	. .	. .	5 A	1	Hn.	Satellite scarcely visible. Parallel 6°.0 (Ver. I). 96.2 (Index). * There is no record as to whether these were read from the Index or Vernier. I suppose them to have been read from the Index.
						49	169.9						
	Mean	. .	. .	. .	. .	7 47	169.6						
	ARIEL	180	. .	. .	. .	10 10	. .	. .	258.5	6 A	. .	Hn.	Umbriel visible, but faint. Parallel 186°.0, Ver. II.
						17			260.4				
	Mean	. .	. .	. .	. .	10 14	. .	. .	259.4				
	OBERON	0	11 10	59.872	68.797*	10 39	. .	260.4	. .	*6 A	. .	Hn.	
			28	.692	.791†			260.6		†5 A			
			30	.774		46		260.2					
	Mean	. .	11 23	59.779	68.794	10 42	. .	260.4					
	TITANIA	0	11 12	60.888	67.632*	10 23	*262.95	. .	. .	*6 A	. .	Hn.	Images for URANUS wt. = 4; for NEPTUNE wt. = 1. * Good.
			27	.880	.565†		260.3			†5 A			
						34	260.4						
						37	261.4						
						46	260.2						
	Mean	. .	11 20	60.884	67.599	10 35	261.0						
3	Satellite of NEPTUNE .	30	8 3	62.504	. .	7 37	151.0	. .	. .	5 A	. .	Hn.	Satellite well seen but *very unsteady;* at 8^h 5^m whole sky cloudy. No more measures possible on account of clouds. * Double weight.
							149.1						
							149.4						
							151.1*						
						50	150.3						
	Mean	. .	. .	. .	. .	7 44	150.3						
5	Satellite of NEPTUNE .	. .	. .	. .	. .	7 24	130.5	. .	. .	6 A	= 4	Hn.	Satellite very faint, but extremely steady. * Half weight.
							128.1						
							126.3*						
						30	130.1						
						38	129.8						
	Mean	. .	. .	. .	. .	7 31	129.3						
16	OBERON	0° ±	9 1	59.820	68.679	8 21	. .	266.94	. .	5 A			* Bad measure.
			9 12	.853	.618			266.20					
								265.7*					
						30		266.2					
	Mean	. .	9 8	59.837	68.649	8 26	. .	266.26					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.			Eye-piece.	Image.	Observer.	Remarks.
							Index.	Ver. I.	Ver. II.				
1875.		°	h. m.	r.	r.	h. m.	°	°	°				
Feb. 16	TITANIA	150 ±	8 46 53	61.942 62.059*	66.530 554	8 33 43	. .	299.6 300.9 303.1 302.9 301.8†	. .	5 A	4	Hn.	Parallel, 349°.5, Ver. I. Images of satellites very good, but the bright moonlight makes them faint. Image of planet bad. Chronometer corr., = + 1^{m}. * Weight, 2. † Double weight.
	Mean	. .	8 50	62.020	66.542	8 39	. .	301.7					
17	Satellite of NEPTUNE .	210	. :	. .	. .	7 9 13 22	. .	. .	32.0 29.6 29.2 32.0	6 A	. .	Hn.	Satellite not visible with 600 at all; with 400 only at rare intervals; with 800, better than with the others. Chron. corr. = − $0^{m}.5$.
	Mean	. .	. .	. .	. .	7 14	. .	. .	30.7				
18	Object near URANUS .	250	8 33	60.379	68.196	8 27	. .	12.60 12.67	. .	5 A	. .	Hn.	Setting for distances, 282.0, Ver. I. Object quite bright. Neither OBERON nor TITANIA visible. Moonlight.
	Mean	. .	. .	. .	. .	. .	. .	12.64					
22	OBERON	220	8 32 44	59.590 .589 .588	*63.893 .945 .890	8 23 27	254.90 254.82 255.22	. .	. .	5 A	. .	Hn.	Wt. of distance, = 5. Wt. of position angle, = 5. Parallel, Ver. I ,349°.48; good. * Should be 68.
	Mean	. .	8 38	59.589	68.909	8 25	254.98						
			8 46 48 49 51	69.935* 74.562† 74.623† 69.858*	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	. . . .	* Planet on micrometer wire. † OBERON on micrometer wire.
	TITANIA	240	8 56 9 5 9 10	61.484 .436 .492	66.940* .982 67.143	8 12 17	. .	. .	219.30 219.50 219.71	5 A	. .	Hn.	Wt. of distance, = 3. Wt. of position angle, = 5. Moonlight. * Poor.
	Mean	. .	9 4	61.471	67.022	8 15	. .	. .	219.50				
26	TITANIA	. .	10 25	61.950*	. .	9 35 37	. .	. .	214.6 214.1	4	. .	Hn.	Setting for distances, 110°, Ver. II. * Weight, 4. † Half weight.
	Mean	. .	. .	. .	. .	9 38 9 51	. . . .	. . . .	214.4 211.2†				
	OBERON	. .	10 6.5	61.230	. .	9 38.5 41.5 49	. .	. .	204.5 203.6 202.2 202.8	. .	. .	Hn.	Setting for distances, 110°, Ver. II. Wt. of distance, = 2. Wt. of position angle, = 3. Watch corr., = + 2^{m}. Coincidence wire A and micrometer wire, 64°.282.
	Mean	. .	. .	. .	. .	9 45	. .	. .	203.3				
Mar. 4	TITANIA	180	8 22 34	60.790 .728 .799	67.793 .760 .675	7 59 8 7	. .	259.86* 260.67† 259.24* 258.94*	. .	5 A	. .	Hn.	Weight of distance, = 4. * Weight, 4. † Weight, 3.
	Mean	. .	8 28	60.772	67.743	8 3 8 40	. . . .	259.61 260.00					
	OBERON	270	8 40 53	61.780 .707 .701	67.031 66.815 .840	8 12 8 18 8 34	. .	. . 350.00	168.64 168.94 168.37	5 A	. .	Hn.	Parallel, 173°.94, Ver. II. Wt. of distance, = 2. Wt. of pos'n angle, = 4. Watch corr., = 0.
	Mean	. .	8 46	61.729	66.895	8 21	. .	. .	168.99				
8	TITANIA	. .	8 44 8 53	60.855 .859 .856 .858	67.682 .671 .701 .679	9 20 26 30	. .	239.24	. . 59.75 59.60 60.72	5 A	. .	N.	Setting for distances, 58° (Index).
	Mean	. .	8 49	60.857	67.683	9 25			59.85				

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest readings).	Microm. II (largest readings).	Washington Mean Time.	Position Circle.			Eye-piece.	Image.	Observer.	Remarks.
							Index.	Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°	°				
1875. Mar. 8	Oberon	. .	8 57	59.845	68.721	9 12	. .	254.55	. .	. .	. .	N.	Setting for distance, 76°.6 (Index). Parallel, 340°.88 (Ver. I), 160°.90 (Ver. II), 71°.3 (Index). * This should be 255°.06.
				.895	.705			5.53					
				.946	.662	16			174.70				
			9 8	.871	.665	19		*355.06					
	Mean	. .	9 2	59.889	68.688	9 15		254.96					
13	Companion of *Sirius*.	. .	. .	63.078	65.470	. .	. .	. .	196.0	3	3	Hn.	Image of *Sirius* unsteady.
				.098	.422	7 30			194.8				
				.076	.483				197.3				
				.116	.489				197.4				
									193.4				
									195.0				
									196.8*				* Very good.
									196.2				
									195.5				
	Mean	. .	. .	63.092	65.466				195.8				
	Companion of *Sirius*.	. .	. .	63.140	65.425	. .	. .	. .	14.4	3	. .	N.	Weight of distance, = 3. Wt. of position angle, = 2.
				.128	.478				12.4				
				.105	.471				15.4				
				.066	.459				15.7				
									11.8				
	Mean	. .	. .	63.110	65.458				13.94				
	Oberon	18	8 32	60.110	68.449	8 56	47.6	. .	. .	. .	. .	N.	Setting for distances, 44°.5 (Index).
				.090	.457		47.4						
				.045	.500	9 3	48.3						
			41	.078	.461								
	Mean	. .	8 37	60.081	68.467	9 0	47.8						
	Titania	170	8 42.5	60.937	67.555	8 54	75.1	. .	. .	5 A	. .	N.	Setting for distances, 78° (Index). Umbriel could be seen but not measured.
				.972	.518		75.2						
				61.041	.555	9 1±	75.5						
			51	60.973	.608								
	Mean	. .	8 47	60.981	67.559	8 57	75.3						
17	Companion of *Sirius*.	. .	. .	63.012	65.577	7 30	. .	. .	192.7	3	. .	Hn.	Wt. for dist., = 2. Wt. for position angle, = 2. Windy. * Good.
				.100	.512				195.4				
				.080	.457				193.4*				
									193.1				
									196.3				
									195.1				
	Mean	. .	. .	63.064	65.515	. .	. .	. .	194.33				
	Companion of *Sirius*.	. .	. .	. .	. .	. .	. .	. .	194.6	3	4	Hn.	Very steady, but through clouds, which at (7.30) cover the whole sky.
18									193.4				
	Mean	. .	. .	. .	. .	. .	. .	. .	194.0				
	Companion of *Sirius*.	. .	. .	63.090	65.467	. .	. .	16.2	. .	3	4	Hn.	† After moving chair, so that the head was in better position, less constrained. * Good.
				.087	.457*			16.4					
22				.141	.430			16.5					
				.122	.458			16.4					
								†14.4					
								†15.0					
								†15.7					
								†14.0					
	Mean	. .	. .	63.110	65.453	. .	. .	15.6					
	Oberon	160	8 12	60.158	68.360	. .	. .	. .	. .	5 A	4	N.	Oberon and Titania in same right line. Setting for dist., 86° (Index).
				.154	.398								
				.165	.385								
			8 27	.168	.406								
	Mean	. .	8 21	60.161	68.387								

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle. Index.	Ver. I.	Ver. II.	Eye-piece.	Image.	Observer.	Remarks.
		°	h. m.	r.	r.	h. m.	°	°	°				
1875. Mar. 22	TITANIA	160	8 13	61.187	67.378	. .	. .	. .	. .	5 A	4	N.	
				.185	.367								
				.166	.363								
			8 28	.180	.373								
	Mean	. .	8 22	61.180	67.370								
	ARIEL	. .	8 34	63.005	. .	8 43	. .	. .	33.1	5 A	. .	N.	Setting for distances, 125° (Ver. II). Wt. for position angle, = 2. Chro. corr. for *Oberon*, *Titania*, and ARIEL, = $+ 1^{m}\ 15^{s}$. * Weight, 1. † Double Weight.
			39	. .	65.475*	46			35.2†	6 A			
			48	.007	.505*								
			55	.048	.535*								
	Mean	. .	8 45	63.020	65.505	8 46	. .	. .	34.6				
	ARIEL	. .	. .	. .	. .	9 8	. .	. .	35.1	. .	. .	Hn.	
25	Companion of *Sirius* .	. .	. .	63.047	65.435	. .	. .	193.7	. .	3	. .	Hn.	Images bad. Parallel, 340°.88 (Ver. I). Weight for distance, = 2. Weight for position angle, = 4.
				.067	461			195.4					
								195.5					
								194.5					
	Mean	. .	. .	63.057	65.448	. .	. .	194.8					
	Companion of *Sirius* .	. .	. .	63.192	65.388	. .	. .	. .	13.8	3	. .	N.	Wt. for distance, = 2. Wt. for pos'n angle, = 3. Lengthened focus.
				.118	.409				15.4				
				.145	.387				14.2				
									14.4				
	Mean	. .	. .	63.152	65.395	. .	. .	. .	14.5				
	UMBRIEL	1	8 25	62.485	(*)	. .	. .	. .	. .	5 A	. .	. .	Obs'r for dist., NEWCOMB. Obs'r for pos. angle, HOLDEN. Setting for dist., 45° (Index). Pos. angle observed with eye-piece No. 10. ARIEL and UMBRIEL well seen with eye-piece No. 10, Chron. corr., = 0. * Weight, 1.
						9 58	226.8	. .	. .	6 A			
			9 20	62.485	66.091		227.6						
				.475	.063		226.4						
			9 30		.092	10 10	224.6						
	Mean	. .	9 5	62.480	66.082	10 4	226.4						
	OBERON	50	8 33	61.439	67.175	9 4	10.3	. .	. .	5 A	. .	N.	Index at 3° for distances.
				.388	.145		10.8						
				.403	.122		10.4						
			8 41	.398	.166	9 8	10.7						
	Mean	. .	8 37	61.407	67.152	9 6	10.55						
	TITANIA	10	8 43	61.176	67.390	8 53	. .	229.1	. .	5 A	. .	N.	Setting for distances, 50° (Index).
				.185	.378			229.4					
				.159	.384			229.4					
			8 51	.137	.415	8 59		229.4					
	Mean	. .	8 47	61.164	67.392	8 56	. .	229.33					
	ARIEL	. .	9 34 }	62.890	65.669	9 40	80.7	. .	. .	6 A	. .	N.	* Double weight.
			37 }				81.7*						
			9 46 }	.928	.622*	9 43	81.4*						
			49 }										
	Mean	. .	9 42	62.909	65.638	9 42	81.4						
27	OBERON	. .	8 47	59.889	68.732	9 17	. .	237.2	. .	. .	. .	N.	Setting for distances, 58° (Index).
				.840	.746				57.3				
			54	.944	.685	21		236.5					
			58	.920	.691			237.4					
						25		237.4					
	Mean	. .	8 53	59.898	68.714	9 21		237.2					
	TITANIA	. .	9 3	61.837	66.752	9 26	. .	285.6	. .	5 A	. .	N.	Setting for distances, 104°.5 (Index.) Parallel, Ver. I, = 340°.9 Index, = 71°.2.
				.852	.685			286.1					
				.830	.705			285.6					
			9 15	.885	.694	9 32		285.2					
	Mean	. .	9 9	61.851	66.709	9 29		285.6					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.			Eye-piece.	Image.	Observer.	Remarks.
							Index.	Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°	°				
1875. Mar. 27	UMBRIEL	. .	9 57	62.564*	66.032	9 49	. .	. .	40.8	10	. .	N.	*At 9^h 58^m.
			10 1		66.000	52		219.2					
						54		221.6					
	Mean	. .	9 59	62.564	66.016	9 52		220.5					
Apr. 5	OBERON?	160	7 57	60.645	68.092	7 37	. .	275.2	. .	5 A	. .	H.	
			8 5	.602	68.017			273 3					
				.627	67.903	44		273.2					
			8 18	.557	68.135			274.7					
						49		275.3					
	Mean	. .	8 8	60.608	68.037	7 43		274.34					
	TITANIA	310	8 36	62.105	66.364	8 22	. .	299.6	. .	5 A	2	H.	Images bad. Parallel very carefully and accurately determined, April 6 was 340°.80 (Ver. I).—N.
				.184	.425			300.1					
				.090	.403			299.9					
			8 48	.070	.421			300.6					
						8 29		300.8					
	Mean	. .	8 42	62.112	66.403	8 26	. .	300.2					
	OBERON	. .	9 14	.675	.884	10 3	97.1	. .	. .	5 A	3	N.	Setting for distances, 99° (Index).
				.685	.896		96.2						
				.695	.902	10 6	96.8						
			9 34	.704	.884								
	Mean	. .	9 24	60.690	67.892	10 4	96.7						
	TITANIA	. .	9 39	62.186	66.381	9 50	301.6	. .	. .	5 A	3	N.	Chron. (1828 Frodsham) corr. = $0^s.5$. * Half-weight.
				.147	.409		302.5						
				.201	.398		303.6*						
			48	.196	.412		299.8*						
						10 0	301.8						
	Mean	. .	9 43	62.182	66.400	9 55	301.9						
6	Companion of *Sirius*.	. .	. .	63.198	65.404	7	. .	193.1	. .	5 A	3	H.	Images fair.
				.160	.397			194.5					
				.208	.389			194.7					
				.163	.380			194.2					
								194.6					
	Mean	. .	. .	63.182	65.392	. .	. .	194.2					
	OBERON	. .	8 6	61.432	67.176	7 53	. .	303.8	. .	. .	2	H.	Hazy, and OBERON very faint. Chro. corr. = — $0^s.7$.
			20	.450	.118			301.2					
								304.1					
								303.7					
						8 1		304.5					
	Mean	. .	8 13	61.442	67.147	7 56	. .	303.5					
8	Companion of *Sirius*.	. .	. .	63.138	65.430	7	. .	194.5	. .	5 A	3	H.	Images shaky.
				.150	.403			194.8					
				.098	.438			195.3					
				.182	.441			194.0					
				.118	.353			194.3					
				.110	.443			194.8					
	Mean	. .	. .	63.133	65.418	. .	. .	194.6					
	TITANIA	180	8 14.5	60.893	67.644	8 3	. .	252.1	. .	5 A	. .	H.	
				.992	.686	7		254.3					
				.925	.585			254.6					
				.980	.688	11		251.0					
			25			12		250.5					
	Mean	. .	8 20	60.948	67.651	8 8	. .	252.5					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle. Index.	Position Circle. Ver. I.	Position Circle. Ver. II.	Eye-piece.	Image.	Observer.	Remarks.
		°	h. m.	r.	r.	h. m.	°	°	°				
1875. Apr. 8	OBERON	. .	. .	. .	. .	8 28 8 32	. .	. .	206.6 207.6 206.3 206.0	5 A	3	H.	Clock stopped.
	Mean	. .	. .	. .	. .	8 30	. .	. .	206.6				
14	Companion of *Sirius*.	. .	. .	63.186 .222 .184 .113 .135	65.382 .383 .387 .350 .410	. .	. .	195.0 194.7 194.6 194.8 194.5	. .	. .	2	H.	For position angle images bad.
	Mean	. .	. .	63.168	65.382	. .	. .	194.7					
	ARIEL	6	8 14 8 27	62.856 .860 .870	65.632* .780 .785	8 30 35 36	152.5 152.8 153.2 152.0	. .	. .	6 A	. .	N.	Telescope E. of pier. Setting for distances, 335° (Ver. II). * Reject.
	Mean	. .	8 20	62.862	65.782	8 34	152.6						
	OBERON	240	8 39 44 45 49	61.526 .569 .536 .554	67.013 66.970 67.005 66.969	9 17 20	. .	9.2 8.4 8.0 8.2	. .	5 A	. .	N.	Setting for distances, 182°.5 (Index); 272° (Ver. II). Obs'r for dist., NEWCOMB. Obs'r for angles, HALL.
	Mean	. .	8 44	61.546	66.989	9 18	. .	8.4					
	TITANIA	290	8 55 9 08	62.340 .342 .320 .325	66.200 .201 .209 .164	. .	. .	. .	. .	6 A	. .	N.	Setting for distances, 232° (Ver.) Haze, and TITANIA very faint.
	Mean	. .	9 2	62.332	66.194								
20	TITANIA	10	8 11 8 22	61.218 .302 .318 .289	67.229 .252 .285 .246	8 1 8 6	. .	44.5 43.2 44.6 44.8	. .	6 A	2	H.	Chron. corr., — 2^m.
	Mean	. .	8 14	61.282	67.253	8 1		44.3					
	OBERON	90	8 44 8 57	61.860 .788 .703 .754	66.724 .845 .770 .730	8 27 8 32	. .	150.0 148.5 149.3 149.8	. .	6 A	2	H.	Chron. corr., — 2^m.
	Mean	. .	8 48	61.776	66.767	8 28		149.4					
21	Companion of *Sirius* .	. .	. .	63.120 .104 .155 .087	65.304 .356 .310 .308	. .	. .	15.2 14.3 14.2 13.7 13.5	. .	3	2	H.	
	Mean	. . .	. .	63.116	65.320	. .	. .	14.18					
	TITANIA	0	8 29 8 38	60.927 .992 .015 .947	67.602 .510 .606 .524	7 58 8 3	. .	69.3 69.9 68.3 69.0 68.6	. .	5 A	3	H.	Watch corr., — 2^m.
	Mean	. .	8 31	60.970	67.560	7 58		69.02					
	OBERON	60	8 16 8 25	61.308 .317 .270 .328	67.224 .253 .180 .194	8 5 8 11	. .	12.8 11.9 12.3 13.5 13.8	. .	5 A	2	H.	Watch corr , — 2^m.
	Mean	. .	8 18	61.306	67.213	8 6	. . .	12.86					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.			Eye-piece.	Image.	Observer.	Remarks.
							Index.	Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°	°				
1875. Apr. 23	OBERON	. .	8 11	59.884	68.630	8 1	. .	57.2	. .	6 A	3	H.	Chron. corr., — 1^{m}.
				.958	.618			56.5					
				.926	.590			56.5					
			8 22	.924	.590	8 6		57.2					
	Mean	. .	8 16	59.923	68.607	8 3	. .	56.85					
	TITANIA	. .	8 34	62.450	66.158	8 26	. .	338.8	. .	6 A	2	H.	Chron. corr. — 1^{m}. Parallel, 160°.68 (Ver. I) determined by a careful observation of a star, by Hn.
				.402	.193			339.6					
				.384	.135			340.2					
			8 44	.442	.133	8 30		339.7					
	Mean	. .	8 38	62.420	66.155	8 27	. .	339.58					
25	OBERON	. .	8 8	60.608	68.003	7 54	. .	288.0	. .	6 A	3	H.	Watch corr., — 0^{m}.5.
				.611	[67].985			286.7					
				.583	.984			287.0					
			8 18	.607	.996	8 0		287.7					
	Mean	. .	8 13	60.602	67.992	7 57	. .	287.35					
	TITANIA	. .	8 39	60.984	67.605	8 21	. .	260.2	. .	6 A	3	H.	Watch corr., — 0^{m}.5. Parallel = 178°.3 (Ver. I).
				.935	.554			259.2					
				.024	.584			258.4					
			8 48	.944	.576	8 25		258.4					
	Mean	. .	8 43	60.972	67.580	8 23	. .	259.05					
29	TITANIA	15	8 32	61.176	67.525	8 17	. .	262.6	. .	. .	2	H.	[Changed focus]. 6 A for angles; 5 A for distances. Watch corr., — 0^{m}.8.
				.136	.430			260.3					
				.163	.335			261.1					
			8 39	.050	.382	8 21		262.2					
	Mean	. .	8 34	61.131	67.418	8 18	. .	261.30					
	OBERON	195	8 43	60.246	68.174	8 23	. .	255.3	. .	. .	2	H.	6 A for angles; 5 A for distances. Watch corr., — 0^{m}.8. Parallel, = 190° 3 (Ver. I).
				.180	.265			254.7					
				.385	.466			254.0					
			8 50	.340	.372	8 26		255.6					
	Mean	. .	8 46	60.288	68.319	8 24	. .	254.90					
May 2	OBERON	150	8 11	60.800	67.614	8 3	. .	306.5	. .	5 A	3	H.	Watch corr., — 0^{m}.9.
				.804	.722			305.8					
				.750	.686			305.7					
			8 21	.732	.690	8 8		306.2					
	Mean	. .	8 15	60.772	67.678	8 5		306.05					
	TITANIA	250	8 40	62.302	66.130	8 26	. .	209.2	. .	6 A	2	H.	Watch corr., — 0^{m}.9. Parallel, = 190°.3 (Ver. I).
				.276	.185			212.2					
				.266	.243			211.8					
			8 52	.420	.387	8 31		209.7					
	Mean	. .	8 45	62.316	66.236	8 28	. .	210.72					
4	TITANIA	180	8 10	60.995	67.490	8 0	. .	277.6	. .	6 A	3	H.	Watch corr., — 1^{m}.3.
				.903	.485			277.0					
				.063	.475			277.8					
			8 19	.974	.544	8 4		277.4					
	Mean	. .	8 13	60.984	67.498	8 1	. .	277.45					
	OBERON	80	8 35	61.736	66.837	8 23	. .	201.5	. .	6 A	2	H.	Watch corr., — 1^{m}.3.
				.725	.866			202.8					
				.688	.933			202.6					
			8 43	.640	.860	8 31		203.8					
	Mean	. .	8 38	61.697	66.874	8 26	. .	202.68					
	TITANIA	180	9 2	60.999	67.496	. .	. .	. .	. .	6 A	. .	N.	Chron. corr., — 1^{m}.3. Parallel, 190°4 (Wt. 3), by Hn.
				.945	.480								
				.080	.525								
			9 16	.032	.495								
	Mean	. .	9 8	61.014	67.499								

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. May 6	OBERON	19	8 0 8 8	60.120 .129 .196 .172	68.350 .330 .320 .305	7 55 7 58	79.0 81.2 80.9 80.2	. .	5 A	4	H.	[Telescope west of pier.] Chron. corr., + 3^m.
	Mean	. .	8 7	60.154	68.326	8 0	80.32					
	TITANIA	95	8 19 8 27	62.420 .320 .409 .385	66.141 .103 .136 .050	8 14 8 17	179.7 180.8 181.8 181.8	. .	6 A	3	H.	Chron. corr., + 3^m.
	Mean	. .	8 26	62.384	66.108	8 18	181.02					
	UMBRIEL	5	8 43 8 49	62.270 .339 .352	66.281 .407 .334	8 30 34 35 37	106.4 100.0 100.2 102.6 104.2	. .	6 A	. .	H.	Chron. corr., + 3^m. * Observer, HOLDEN.
	Mean	. .	8 49 9 3	62.320 [62.490	66.341 *66.172]	8 37	102.68					
10	O Σ 248 . . . . R. A. 12^h 18^m 4^s. Dec. + 6° 38′.	. .	. .	. .	. .	. .	. .	. .	. .	. .	H.	With 400, it is single; with 600, it is single. Star reddish; mag. 7. Parallel, 186°.5.
	42 *Coronæ Borealis* . R. A. 13^h 4^m 9^s. Dec. + 18° 10′.	120?	. .	. .	. .	. .	. .	. .	3	. .	H.	Magnitude, 6.6. Suspected elongation in direction 120° ±, but images very bad.
	O Σ 270 . . . . R. A. 13^h 41^m 36^s. Dec. +18° 3′.	350	. .	63.372 .302 .336 .280 .310	65.165 .168 .240 .256 .246	9 30	. .	106.6 105.2 106.2 105.0 105.0	3	2	H.	Mag. 5 and 12 (ε Bootis). Companion smaller than 12th; easily seen, but about 14th.
	Mean	. .	. .	63.320	65.215	. .	. .	105.6				
11	OBERON (?). . . .	. .	. .	. .	. .	8 15 8 23	. .	214.4 216.2 215.2 214.5	5 A	. .	H.	Moon very near and object very faint. Watch corr., −1^m.
	Mean	. .	. .	. .	. .	8 18	. .	215.07				
	O Σ 251 . . . . R. A 12^h 23^m 8^s. Dec. + 32° 3′.	. .	. .	. .	. .	. .	. .	. .	. .	. .	. .	Mag. 7–8, 9. Not separated with 3 or 4. A little elongation in about 80° (?).—H. Very uncertain. Index, 256° (?).—Hn.
	h 521 . . . . . R. A. 12^h 39^m 10^s. Dec. 28° 3′.	0	. .	60.998* .950*	67.525* .602*	. .	93.9† 92.0† 93.8†	. . . .	3 . .	. .	H*. Hn.†	Mag. 7–14. HERSCHEL says mag. of comp. is 20. It is easily seen with 3.
	Mean	. .	. .	60.974*	67.564*	. .	93.2†					
							93.6 94.0 93.4	. .	. .	.	H.	
	Mean	. .	. .	. .	. .	. .	93.7					
12	TITANIA	185	8 15 8 28	61.072 .174 .203 .172	67.232 .238 .353 .271	8 5 8 11	73.4 74.6 73.8 74.3	. .	5 A	2	H.	A bad night. Watch corr., + 1^m.3.
	Mean	. .	8 23	61.155	67.274	8 9	74.02					
13	TITANIA	170	8 18 8 27	61.228 .135 .136 .135	67.460 .379 .455 .488	8 0 8 5	99.6 100.0 100.2 100.5	. .	5 A	3	H.	Faint, but steady. (Parallel = 186°7).
	Mean	. .	8 22	61.158	67.446	8 2	100.07					

Date.	Object observed.	Estimated posi-tion angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875, May 13	OBERON	190	8 33	60.060	68.517	8 7	81.0	. .	5 A	3	H.	
				.000	.550		79.6					
				.011	.502		78.4					
			8 45	.108	.510		78.8					
						8 13	78.8					
	Mean	. .	8 39	60.045	68.520	8 10	79.3					
	O Σ 269	. .	. .	. .	. .	. .	. .	. .	4	.	H.	Stars not separated, but oblong in about 50°, P.
	Σ 1768	. .	. .	. .	. .	. .	. .	. .	3	.	H.	Star is single; no elongation.
	Burnham 115 . . .	. .	. .	. .	. .	. .	. .	. .	3, 4	.	H.	Companion not visible. Images bad to-night.
14	TITANIA	130	8 19	62.002	66.344	8 1	133.4	. .	6 A	2	H.	Chron. corr., = 0.
				.036	.395		134.9					
			24	Clouds.			134.2					
						8 6	134.6					
	Mean	. .	8 21	62.019	66.370	8 4	134.28					
	OBERON	180	. .	. .	. .	8 9	94.1	. .	6 A	2	H.	
							94.2					
							94.3					
						12	94.3					
	Mean	. .	. .	. .	. .	8 10	94.2					
16	TITANIA	10	9 3	61.388	67.190	8 54	67.2	. .	6 A	2	H.	
				.574	.160		66.4					
			9 12	.386	.060		68.2					
						8 57	68.4					
	Mean	. .	9 8	61.449	67.137	8 56	67.5					
	OBERON	120	9 21	61.203	67.210	9 15	138.8	. .	6 A	2	H.	
				.288	.291		138.7					
			9 28	.281	.200		137.7					
						9 19	138.0					
	Mean	. .	9 24	61.257	67.234	9 17	138.3					
17	TITANIA	2	8 16	61.000	67.527	8 9	92.0	. .	6 A	2	H.	Chron. corr. not over 1^{m}.
				.050	.486		91.8					
				[60].950	.490		91.6					
			8 25	61.081	.468	8 12	91.6					
	Mean	. .	8 20	61.020	67.493	8 10	91.75					
	OBERON	94	8 33	61.845	66.766	8 27	180.8	. .	6 A	2	H.	Chron. corr. not over 1^{m}.
				.806	.690		181.2					
				.900	.578		180.8					
			41	.833	.646	8 30	180.0					
	Mean	. .	8 37	61.846	66.670	8 28	180.70					
19	OBERON	. .	8 27	60.578	68.005	8 20	67.5	. .	6 A	2	H.	Very faint. Chron. corr., = + 3^{m}.
			33	.546	.042		68.1					
			35	.530	67.996		67.2					
			8 42	.500	68.093	8 23	67.0					
	Mean	. .	8 37	60.538	68.034	8 24	67.45					
22	OBERON	20	8 41	60.663	67.892	8 26	117.8	. .	6 A	2	H.	Very faint. Chron. corr., — 2^{m} 47^{s}.
			47	.808	.840		117.6					
							118.3					
						8 29	117.7					
	Mean	. .	8 41	60.736	67.866	8 25	117.85					
	TITANIA	200	8 50	61.425	67.140	8 32	106.7	. .	6 A	2	H.	Very faint. Chron. corr., — 2^{m} 47^{s}.
			56	.520	.080		106.9					
							106.8					
						8 36	106.0					
	Mean	. .	8 50	61.472	67.110	8 31	106.60					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading.)	Microm. II (largest reading.)	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. May 25	TITANIA	0	8 31 8 39	61.150 .211 .226 .270	67.300 .298 .333 .260	8 16 8 20	74.3 75.8 76.3 77.2	. .	6 A	3	H.	Chron. corr., — $2^{m}.6$.
	Mean	. .	8 32	61.214	67.298	8 15	75.90					
	OBERON	220	8 42 8 54	60.993 61.103 .103 .091	67.356 .385 .399 .363	8 22 8 26	47.8 46.5 46.2 47.6	. .	6 A	2	H.	Very faint. Chron. corr., — $2^{m}.6$.
	Mean	. .	8 45	61.072	67.376	8 21	47.02					
	JUPITER . . . . Short diameter.	. .	. . 9 30	60.131 .066 .080	68.438 .452 .494	. .	. .	. .	5 A	3	H.	Setting for distances, 163°.2 (Ver. I).
	Mean	. .	. .	60.092	68.461							
	JUPITER . . . . Long diameter.	. .	. .	59.858 .930	68.520 .500	. .	. .	. .	5 A	2	H.	Setting for distances, 73°.2 (Ver. I). Parallel from URANUS, May 26, = 186°.6 (Ver. I). Haze.
	Mean	. .	. .	59.894	68.510							
26	Diameter of JUPITER.	. .	. .	59.908 .914 .908 .890	68.647 .651 .647 .622	. .	. .	. .	5 A	3	H.	Setting for distances, 74°.0 (Ver. I).
	Mean	. .	. .	59.905	68.642							
				60.019 .009 59.955 .954	68.535 .514 .550 .479	. .	. .	. .	5 A	3	H.	Setting for distances, 119° (Ver. I).
	Mean	. .	. .	59.984	68.520							
				60.118 .132 .133 .184	68.442 .358 .384 .410	. .	. .	. .	5 A	3	H.	Setting for distances, 164° (Ver I).
	Mean	. .	. .	60.142	68.398							
				60.038 59.982 .997 60.050	68.584 .605 .602 .584	. .	. .	. .	5 A	3	H.	Setting for distances, 209°.0 (Ver. I). Observations from 13^{h} to 14^{h}, sid. time. JUPITER near meridian.
	Mean	. .	. .	60.017	68.594							
27	OBERON	180	8 44 8 52	60.042 .028 .018	68.552 .531 .632	8 27 8 32	87.6 87.5 87.2 87.0	. .	6 A	3	H.	Chron. corr., — $2^{m}.6$.
	Mean	. .	8 45	60.029	68.572	8 27	87.32					
	TITANIA	330	8 56 9 5	61.992 62.087 .027	66.552 .573 .487	8 34 8 37	134.4 134.1 132.5 131.8	. .	6 A	2	H.	Chron. corr., — $2^{m}.6$.
	Mean	. .	8 58	62.039	66.537	8 33	133.20					
	h 5489	200	. .	58.776 .678	69.871 70.008	. .	251.6 248.0 247.6 248.9	. .	3	2	H.	Mag. 16th. There is nothing visible in H.'s place. The above object excessively faint.
	Mean	. . .	. .	58.727	69.940		249.0					
	Σ 1967	. .	. .	. .	. .	. .	. .	. .	3, 4	.	H.	No trace of this being a double star.

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle. Ver. I.	Position Circle. Ver. II.	Eye-piece.	Image.	Observer.	Remarks.
1875.		°	h. m.	r.	r.	h. m.	°	°				
May 27	6 *Serpentis*	15	. .	63.998	64.580	. .	81.0	. .	3	3	H.	Mag. 10th. A reddish star, and a very fine double star. Parallel, =186°.6, Ver. I (good). Zero of position angle, =96°6 (Ver. I).
				.955	.555		81.6					
				.943	.635		81.4					
							83.2					
	Mean	. .	. .	63.965	64.590	. .	81.8					
28	OBERON	160	8 57	60.296	68.332	8 29	103.3	. .	6 A	3	H.	Chron. corr., — $2^m.5$.
				.261	.311		103.0					
				.241	.298		102.9					
			9 7	.231	.340	8 33	103.4					
	Mean	. .	9 0	60.257	68.320	8 28	103.15					
	TITANIA	270	8 44	62.454	66.076	8 37	19.6	. .	6 A	2	H.	Very faint. Chron. corr., — $2^m.5$.
				.355	.185		20.4					
			8 52	.409	.130		20.5					
						8 41	19.0					
	Mean	. .	8 46	62.406	66.130	8 36	19.88					
	W. XV, 716 . . .	. .	. .	. .	. .	. .	. .	. .	. .	.	H.	Star appears oblong with 3. Night not good enough for higher power.
	R. A. $15^h\ 31^m\ 42^s$.											
	Dec. + 40° 13′.											
	2 *Serpentis*	. .	. .	. .	. .	. .	. .	. .	. .	.	H.	With Clark 3 appears oblong in distance 15°; but with 5 A no trace of duplicity. There is a companion 25″ distant, and P = 220° (by estimation); companion is of 13–14th mag.
	R. A. $14^h\ 55^m\ 23^s$.											
	Dec. + 0° 21′.											
	Σ 3091	250	. .	63.000	65.485	. .	208.8	. .	5 A	2	H.	Not a close double star, but two companions, one in P = 270°, and D = 30″ of 12th mag.; second measured 14th mag.
	R. A. $15^h\ 9^m\ 43^s$.			62.974	.596		205.2					
	Dec. — 4° 26′.			.984	.558		207.7					
	Mean	. .	. .	62.986	65.546	. .	207.2					
	ν Scorpii	45	. .	64.023	64.527	. .	53.4	. .	3	2	H.	Not a good night for double stars. Images unsteady.
	R. A. $16^h\ 5^m$.			.002	.543		54.3					
	Dec. — 19° 9′.			.020	.548		55.6					
	Mean	. .	. .	64.015	64.539		54.4					
31	Neb. H. 4004 . . .	160	. .	. .	. .	. .	128.8	. .	1	. .	H.	(Star images too bad for measurement). This Neb. is 4′ or 5′ long, condensed and tolerably bright near the center. Very narrow. There is a small round Neb. 2′.2 north of center of large Neb., and $14^s.5$ preceding it. The small Neb. is fainter than the large, but easily seen.
	(Axis of Neb.)						127.1					
							127.7					
							127.9					
June 1	(Long diameter of JUPITER.)	. .	. .	60.002	68.581	. .	. .	. .	5 A	3	H.	Setting for distances, 75°8 (Ver. I). Measures taken in twilight.
				59.992	.581							
				.970	.565							
				.950	.544							
	Mean	. .	. .	59.978	68.568							
	Diameter of JUPITER.	. .	. .	60.154	68.390	. .	. .	. .	5 A	3	H.	Setting for distances, 120°.8 (Ver. I).
				.130	.408							
				.118	.449							
				.140	.435							
	Mean	. .	. .	60.136	68.420							
				60.213	68.312	. .	. .	. .	5 A	3	H.	Setting for distances, 165°.8 (Ver. I).
				.223	.320							
				.220	.255							
				.250	.289							
	Mean	. .	. .	60.226	68.294							

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. June 1	(Diameter of JUPITER)	. .	. .	60.115 .099 .140 .145	68.470 .495 .455 .462	. .	. .	. .	5 A	3	H.	Setting for distances, 210°.8 (Ver. I). Image a little worn at end. Haze coming on.
	Mean	. .	. .	60.125	68.470							
4	Diameter of JUPITER.	. .	. .	60.210 .199 .173 .198	68.399 .373 .384 .390	. .	. .	. .	5 A	3	H.	Setting for distances, 300°.7 (Ver. I).
	Mean	. .	. .	60.195	68.386							
				60.273 .275 .251 .303	68.271 .253 .276 .290	. .	. .	. .	5 A	3	H.	Setting for distances, 165°.7 (Ver. I).
	Mean	. .	. .	60.275	68.272							
				60.200 .210 .196 .190	68.361 .370 .383 .386	. .	. .	. .	5 A	3	H.	Setting for distances, 201°.7 (Ver. I).
	Mean	. .	. .	60.199	68.375							
				60.143 .044 .038 .057	68.518 .496 .511 .526	. .	. .	. .	5 A	3	H.	Setting for distances, 255°.7 (Ver. 1).
	Mean	. .	. .	60.070	68.513							
9	5 *Serpentis*	30	. .	63.142	65.288	. .	. .	238.4 238.4 238.5	3	. .	Hn.	Magnitude, 5.12.
	Mean	. .	. .	. .	. .	. .	. .	238.4				
	2 *Serpentis* . . . . R. A. 14h 55m. Dec. 0°.	. .	. .	. .	. .	. .	. .	. .	. .	. .	Hn.	Elongated. P = 100 ± ? Seeing not good enough to measure it.
10	Diameter of JUPITER .	. .	. .	60.108 .111 .066 .135	68.369 .383 .430 .380	. .	. .	. .	5 A	. .	H.	Setting for distances, 73°.0 (Ver. I). Twilight.
	Mean	. .	. .	60.105	68.390							
				60.130 .205	68.319	. .	. .	. .	5 A	. .	H.	Setting for distances, 118°.0 Clouds. Image bad.
	Mean	. .	. .	60.168								
	σ Coronæ . . . . Σ 2032 [A and B]	180	. .	63.938 .951	64.626 .631	. .	76.2 76.5 79.6 78.4	. .	3	. .	Hn.	
	Mean	. .	. .	63.944	64.628	. .	77.7					
	O Σ 538 = Σ 2032 = σ Coronæ. [A and C]	210	. .	62.938	65.890	. .	. .	49.9 50.8	. .	. .	Hn.	Magnitude, 15.
	Mean	. .	. .	. .	. .	. .	. .	50.4				

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle. Ver. I.	Position Circle. Ver. II.	Eye-piece.	Image.	Observer.	Remarks.
1875.		°	h. m.	r.	r.	h. m.	°	°				
June 20	Tethys	85	14 27	60.013	68.530	14 9	11.3	. .	5 A	2	H.	Chron. corr., — $3^{m}.6$.
				59.981	.642		10.5					
				.928	.542		11.0					
			14 35	.988	.545	14 11	10.1					
	Mean	. .	14 27	59.978	68.565	14 6	10.7					
	Dione	95	14 55	59.946	68.616	14 13	3.5	. .	5 A	2	H.	Chron. corr., — $3^{m}.6$.
				.890	.640		3.6					
			15 0	.892	.692		2.8					
						14 15	2.3					
	Mean	. .	14 54	59.909	68.649	14 10	3.0					
	Rhea	85	14 36	58.118	70.423	14 17	10.0	. .	5 A	2	H.	Chron corr., — $3^{m}.6$.
				.084	.386		10.0					
			14 50	.081	.453		9.6					
						14 20	9.9					
	Mean	. .	14 39	58.094	70.421	14 15	9.9					
	Titan	. .	15 23	60.269	68.261	15 15	300.7	. .	5 A	3	H.	Chron. corr., — $3^{m}.6$. Strong moonlight and some haze; could not see Hyperion or Mimas; seeing better for Titan—in twilight.
				.285	.259		302.1					
				.282	.276		302.2					
			15 32	.305	.280	15 18	301.7					
	Mean	. .	15 24	60.285	68.269	15 13	301.7					
21	. . . .	. . .	. .	. .	. .	. .	. .	. .	. .	. .	Hn.	Parallel, 6°.57, Ver. I; 186°.6, as Ver II; good.
	(Nebula, H. 4302) . R. A. 17^{h} 20^{m}. N. P. D. 113°.5.	160	. .	. .	. .	. .	340.0* 336.5* 336.0* 330.5*	. .	3	. .	Hn.	Direction (approximation) of major axis. * Uncertain.
	Mean	. .	. .	. .	. .	. .	335.8					
23	Double star . . . R. A. 14^{h} $54^{m}.3$. N. P. D. 87°.3.	210	. .	63.682 .612	64.784 .862	. .	. .	61.9 63.5 63.6 63.1	3	. .	Hn.	Mag., 12–13. [Probably this is the magnitude of the companion; magnitude of principal star not noted.] Faint (16 mag.) star precedes this pair.
	Mean	. .	. .	63.647	64.923	. .	. .	63.0				
24	Rhea	40	14 51	62.260	66.324	14 45	. .	49.2	5 A	3	H.	Chron. corr., — $3^{m}.8$.
				.188	.310			48.6				
			14 56	.162	.375			48.7				
						14 49		48.5				
	Mean	. .	14 50	62.203	66.336	14 43	. .	48.8				
	Tethys	95	15 10	60.761	67.783	14 58	352.7	. .	5 A	3	H.	Chron. corr., — $3^{m}.8$.
				.774	.732		351.8					
			15 16	.810	.715		352.3					
						15 2	352.8					
	Mean	. .	15 9	60.782	67.743	14 56	352.4					
	Dione	260	15 22	60.263	68.204	15 17	13.3	. .	5 A	3	H.	Chron. corr., — $3^{m}.8$.
				.331	.186		14.9					
			15 28	.309	.215		13.4					
						15 20	14.4					
	Mean	. .	15 21	60.301	68.202	15 15	14.0					
26	Dione	95	15 29	59.525	69.002	14 47	352.9	. .	5 A	3	H.	Chron. corr., — $3^{m}.8$.
				.601	68.955		352.9					
			15 34	.540	.955		352.5					
						14 50	352.8					
	Mean	. .	15 28	59.555	68.971	14 45	352.8					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.			Eye-piece.	Image.	Observer.	Remarks.
							Index.	Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°	°				
1875. June 26	TETHYS	110	15 36 15 40	62.160 .160 .238	66.408 .330 .388	14 52 14 54	. .	344.7 344.0 342.7 343.4	. .	5 A	3	H.	Chron. corr., – 3^{m}.8.
	Mean	. .	15 34	62.186	66.375	14 49	. .	343.7					
	RHEA	140	15 42 15 46	62.326 .407 .414	66.191 .134 .126	14 56 14 58	. .	310.4 309.8 309.1	. .	5 A	3	H.	Chron. corr., – 3^{m}.8. Clouds.
	Mean	. .	15 40	62.382	66.150	15 53	. .	309.8					
30	JAPETUS	90	14 44 14 52	56.387 .498 .432	72.061 .098 .030	14 18 14 21	. .	6.2 5.7 5.9 5.7	. .	5 A	2	H.	Chron. corr., – 3^{m}.8.
	Mean	. .	14 44	56.439	72.063	14 16	. .	5.9					
	RHEA	100	14 55 15 2	57.917 .951 .027	70.540 .600 .546	14 22 14 25	. .	351.2 351.6 351.7 351.2	. .	5 A	2	H.	Chron. corr., – 3^{m}.8.
	Mean	. .	14 55	57.965	70.562	14 20	. .	351.4					
	TETHYS	250	15 29	62.742 .776 .748	65.734 .761 .764	15 13 16	. .	41.0 40.3 40.0	. .	5 A	2	H.	Chron. corr., – 3^{m}.8.
	Mean	. .	. .	62.755	65.753	15 11	. .	40.4					
	DIONE	270	15 44 15 49	58.868 .899	69.621 .614	15 39 15 42	. .	355.5 355.2 354.8	. .	5 A	2	H.	Chron. corr., – 3^{m}.8.
	Mean	. .	15 43	58.884	69.618	15 37	. .	355.2					
July 7	Nebula . . . . G. C. 4447 (Ring Nebula in *Lyra*).	. .	. .	. .	. .	. .	. .	. .	. .	. .	.	Hn.	Coincidence of wire A and micrometer wire, 64.288. Measures of angle of position of four lines drawn from bright star A (14 m.) *following* the nebula and tangent to the exterior and interior ovals.
	A B_2	. .	. .	. .	. .	. .	307 309 307	. .	. .	. .	.	.	(B_2 on south edge of exterior oval).
	Mean	. .	. .	. .	. .	. .	307.7						
	A B_4	. .	. .	. .	. .	. .	†297* †299 †299	. .	. .	. .	.	.	(B_4 on south edge of interior oval). * Half-weight. † Rather uncertain.
	Mean	. .	. .	. .	. .	. .	†298.6						
	A B_3	. .	. .	. .	. .	. .	258* 257* 257*	. .	. .	. .	.	.	(B_3 on north edge of interior oval). * Rather better than A B_4.
	Mean	. .	. .	. .	. .	. .	257.3						
	A B_1	. .	. .	. .	. .	. .	245 244 246	. .	. .	. .	.	.	(B_1 on north edge of exterior oval). Measures of △ R A of bright star A and four tangents to the exterior and interior ovals.
	Mean	. .	. .	. .	. .	. .	244						
	A and n_1	. .	. .	61.96 62.08	. .	. .	. .	. .	. .	. .	.	.	Fixed wire on star A; micrometer wire on n_1; n_1 is not the *extreme*, but where the nebulosity begins to be definite.
	Mean	. .	. . .	62.02									

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
1875.		°	h. m.	r.	r.	h. m.	°	°				
July 7	A and n_2	. .	. .	60.60	. .	. .	. .	. .	. .	.	.	In this measure again it is hard to fix the limit: there is well-marked nebulosity *preceding* n_2 (*i. e.* inside the main ellipse).
				60.67								
	Mean	. .	. .	60.64								
	A and n_3	. .	. .	56.08								
				55.95								
	Mean	. .	. .	56.02								
	A and n_4	. .	. .	53.67*	. .	. .	. .	. .	. .	.	Hn.	* Extreme.
				53.94								
				53.75*								
12	RHEA	25	14 34	62.544	66.018	14 27	252.6	. .	5 A	3	H.	Chron. corr., — 4^{m}.3.
				.452	65.992		251.3					
				.549	66.044		251.6					
			14 41	.524	.049	14 32	252.2					
	Mean	. .	14 33	62.517	66.026	14 25	251.9					
	DIONE	85	14 50	58.928	69.536	14 43	4.9	. .	5 A	3	H.	Chron. corr., — 4^{m}.3.
				.930	.569		5.2					
				.958	.557		4.5					
			14 59	.910	.575	14 46	4.6					
	Mean	. .	14 50	58.932	69.559	14 40	4.8					
	TETHYS	280	15 9	61.296	67.243	15 3	348.9	. .	5 A	3	H.	Chron. corr., — 4^{m}.3. Parallel, = 6°.6 (Ver. I).
				.280	.239		349.1					
				.305	.158		349.0					
			19	.311	.214	15 6	348.4					
	Mean	. .	15 10	61.298	67.214	15 0	348.8					
14	TETHYS	305	14 57	62.605	65.973	14 51	154.2	. .	5 A	3	H.	Chron. corr., — 4^{m}.4.
				.630	.958		153.3					
			15 5	.631	.882		152.0					
						14 54	152.4					
	Mean	. .	14 58	62.622	65.938	14 48	153.0					
	ENCELADUS	250	15 20	62.006	66.546	15 8	. .	199.1	5 A	3	H.	Chron. corr., — 4^{m}.4.
				61.920	.578			197.0				
				.898	.643			198.0				
			15 26	.893	.668	15 12		196.3				
	Mean	. .	15 19	61.929	66.609	15 6	. .	197.6				
	DIONE	300	15 34	61.444	67.073	15 29	158.6	. .	5 A	3	H.	Chron. corr., — 4^{m}.4.
			38	.458	.080		158.6					
							159.3					
						15 32	159.5					
	Mean	. .	15 32	61.451	67.076	15 26	159.0					
	RHEA	145	15 44	61.901	66.662	15.40	135.8	. .	5 A	3	H.	Chron. corr., — 4^{m}.4,
			47	.884	.710		136.8					
						42	134.8					
	Mean	. .	15 41	61.892	66.686	15 37	135.8					
	TITAN	150	15 53	59.470	69.080	15 48	126.0	. .	5 A	3	H.	Chron. corr., — 4^{m}.4. A little haze at times, but the best seeing for SATURN that I have yet had. Divisions in ring sharp and steady, and lines on disk well seen.
			56	. . .485	.062	50	124.7					
	Mean	. .	15 50	59.478	69.071	15 45	125.4					
16	HYPERION	270	14 4	42.606*	64.280†	13 55	179.6	. .	3 A	2	H.	Chron. corr.,— 4^{m}.4. Object very faint; moonlight. The seeing very bad, and gave up observing. * Single distance. † Coincidence.
				.515*	.245†		179.6					
				.460*	.265†		179.6					
			14 10	.541*	.260†	14 1	179.6					
	Mean	. .	14 3	42.530	64.262	13 54	179.6					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest readings).	Microm. II (largest readings).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. July 24	Tethys	90	13 18	59.818	68.695	13 13	183.8	. .	5 A	2	H.	Chron. corr., — $4^{m}.7$.
				.792	.740		184.0					
			23	.775	.729		183.7					
						13 15	183.3					
	Mean	. .	13 16	59.795	68.721	13 9	183.7					
	Rhea	265	13 46	57.081	71.380	13 25	187.8	. .	5 A	3	H.	Chron. corr., — $4^{m}.7$.
				.077	.414	42	187.9					
			13 53	.089	.392		187.4					
						44	187.5					
	Mean	. .	13 45	57.082	71.395	13 32	187.6					
	Titan	80	13 58	51.134	77.410	13 55	193.6	. .	5 A	3	H.	Chron. corr., — $4^{m}.7$.
			14 03	.080	.364		193.3					
						13 56	193.4					
	Mean	. .	13 56	51.107	77.387	13 51	193.4					
	Titan	. .	14 16	51.033	. .	14 9	193.5	. .	5 A	.	D.*	*C. L. Doolittle. Observations through thin clouds and haze. Parallel, = 186°.6 (Ver. I). Hall. Chron. corr., — $4^{m}.7$.
			24		77.606	14 11	193.8					
	Mean	. .	14 15	. .	. .	14 5	193.6					
26	Rhea	80	13 18	59.120	69.361	13 7	196.4	. .	5 A	3	H.	Chron. corr., — $4^{m}.7$.
				.194	.378		196.2					
				.120	.400		196.5					
			13 25	.096	.422	13 10	196.0					
	Mean	. .	13 17	59.132	69.390	13 4	196.3					
	Tethys	95	13 27	59.721	68.795	13 11	179.3	. .	. .	3	H.	Chron. corr., — $4^{m}.7$.
				.753	.820		180.0					
				.722	.756		178.8					
			13 34	.725	.766	13 13	179.2					
	Mean	. .	13 26	59.730	68.784	13 7	179.3					
	Dione	96	13 35	58.493	70.016	13 14	178.5	. .	. .	3	H.	Chron. corr., — $4^{m}.7$.
				.498	.002		178.2					
				.488	.017		177.5					
			13 43	.508	.004	13 16	178.1					
	Mean	. .	13 34	58.497	70.010	13 10	178.1					
	Enceladus . . .	98	13 53	60.865	67.591	13 50	173.3	. .	II.	2	H.	Chron. corr., — $4^{m}.7$. Very faint object.
				.946	.618		173.4					
				.865	.587		174.2					
			13 59	.898	.618	13 52	174.3					
	Mean	. .	13 51	60.894	67.604	13 46	173.8					
	Hyperion	90	14 9	64.258†	87.515*	14 5	185.4	. .	3 A	3	H.	Chron. corr., — $4^{m}.7$. *Hyperion. †Coincidence.
			14 10	.271†	.527*	14 6	185.5					
	Mean	. .	14 5	64.264	87.521	14 1	185.4					
	Titan	85	14 24	64.328	84.847*	14 18	181.6	. .	3 A	.	D.	Chron. corr., — $4^{m}.7$. *Titan.
			26	.292	.924*	20	181.3					
	Mean	. .	14 20	64.310	84.886	14 14	181.4					
27	Rhea	100	13 6	56.849	71.717	13 2	174.3	. .	3 A	2	H.	Chron. corr., — $4^{m}.8$.
				.913	.722		174.3					
				.848	.704		174.5					
			13 14.5	.884	.704	13 4	174.7					
	Mean	. .	13 5	56.874	71.712	12 58	174.4					
	Dione	260	13 21	59.507	69.054	13 16.5	189.3	. .	3 A	2	H.	Chron. corr., — $4^{m}.8$.
				.436	.148		188.8					
				.530	.130		188.9					
			13 28	.467	.120	13 19	188.6					
	Mean	. .	13 20	59.498	69.113	13 13	188.9					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
1875.		°	h. m.	r.	r.	h. m.	°	°				
July 27	TETHYS	275	13 37	59.900	68.656	13 32	176.0	. .	3 A	2	H.	Chron. corr., — $4^m.8$.
				.925	.612		175.6					HYPERION was seen at first, but sky became so thick that it was invisible.—H.
				.927	.638		176.0					
			13 46	60.008	.623	13 35	176.5					
	Mean	. .	13 37	59.940	68.632	13 29	176.0					
	Triple star in Trifid Nebula.	270	. .	60.038	64.508	. .	172.4	. .	3	3	Hn.	
				.035	.530		175.2					
							173.0					
							172.2					
	Mean			64.037	64.519		173.2					
29	HYPERION	100	12 58	64.275*	85.353	12 21	175.9	. .	3 A	3	H.	*Coincidence. †Clock stopped.
				.291*	.445	12 23	176.6					
				.290*	.378	†12 54.5	175.5					
				.291*	.333	12 55	175.4					
			13 02	.270*	.375	12 56	175.9					
	Mean	. .	12 55	64.283	85.377	12 37	175.9					
	DIONE	115	13 19	60.040	68.484	13 12	168.3	. .	5 A	3	H.	
				.060	.500		168.9					
				.033	.414		167.9					
			13 27	.060	.434	13 14	168.1					
	Mean	. .	13 18	60.048	68.465	13 8	168.3					
	TETHYS	280	13 28	60.673	67.787	13 15	172.0	. .	5 A	3	H.	
				.732	.808		173.0					
				.710	.825		171.7					
			13 35	.683	.790	13 17	172.1					
	Mean	. .	13 27	60.700	67.802	13 11.	172.2					
	RHEA	275	13 41	56.044	72.504	13 38	178.2	. .	5 A	3	H.	
				.046	.494		178.7					
				.004	.520		178.9					
			13 51	.026	.503	13 40	178.6					
	Mean	. .	13 41	56.030	72.505	13 34	178.6					
	TITAN	115	14 0	53.888	74.654	13 55	160.1	. .	5 A	. .	D.	In early part of observations some thin clouds, which interfered with transit observations of JAPETUS and HYPERION. Then clock made a delay. Verified parallel, 186°.6 (Ver. I).
			14 22	.816	.572		159.6					
						13 58	159.8					
	Mean	. .	14 6	53.852	74.613	13 52	159.8					
Aug. 5	Triple star in Trifid Nebula. R. A. 17^h 53^m. Dec. — 23°. A and B.	200	. .	. .	. .	. .	. .	246.7	3	3	Hn.	
								245.4				
								244.5				
								245.9				
	Mean	. .	. .	. .	. .	. .	. .	245.6				
	A and C . . .	10	. .	. .	. .	. .	. .	254.3	3	3	Hn.	
								253.6				
								252.8				
	Mean	. .	. .	. .	. .	. .	. .	253.6				
	B and E . . .	190	. .	. .	. .	. .	. .	263.4	. .	3	Hn.	Mag. 15.
								263.4				
								264.4				
	Mean	. .	. .	. .	. .	. .	. .	263.7				
	A and H . . .	100	. .	62.35	. .	. .	170.9	. .	. .	2	Hn.	* Coincidence of wires. Mag. 16.
				62.33	64.30*		170.8					
							167.0					
	Mean	. .	. .	62.34	. .	. .	169.6					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Aug. 5	RHEA	95	11 26	56.408	72.167	11 22	176.4	. .	3 A	3	H.	Chron. corr., — $5^{m}.1$.
				.413	.180		176.3					
				.413	.125		176.0					
			11 35	.352	.131	11 24	176.2					
	Mean	. .	11 25	56.396	72.151	11 18	176.2					
	DIONE	290	11 48	60.884	67.603	11 44	162.2	. .	3 A	3	H.	Chron. corr., — $5^{m}.1$.
				.980	.624		161.5					
				.920	.560		162.2					
			11 54	.955	.603	11 47	162.2					
	Mean	. .	11 46	60.935	67.598	11 40	162.0					
	TETHYS	240	12 06	62.707	65.857	11 59	216.3	. .	. .	2	H.	Chron. corr., — $5^{m}.1$.
				.692	.856		218.0					
				.632	.860		216.5					
			12 14	.633	.972	12 02	216.0					
	Mean	. .	12 5	62.666	65.887	11 55	216.7					
	JAPETUS	270	12 24	. .	64.268*	12 19	185.3	. .	3 A	3	H.	Chron. corr., — $5^{m}.1$.
				38.615	.270*		185.4					* Coincidence.
				.612	.275*		185.5					
				.604	.264*	12 21	185.5					
			12 27	.640								
	Mean	. .	12 20	38.618	64.269	12 15	185.4					
	ENCELADUS . . .	250	12 36.5	62.331	66.170	13 32	199.2	. .	3 A	2	H.	This object came out while I was observing; it was very faint.
				.288	.220		200.0					Chron. corr., — $5^{m}.1$.
			12 42	.170	.247		200.6					
						12 35	201.1					
	Mean	. .	12 34	62.263	66.212	12 28	200.2					
	TITAN	280	12 50	64.300*	78.875	12 48	170.2	. .	3 A	3	H.	Chron. corr., — $5^{m}.1$.
			12 51.5	.292*	.895	49	170.2					* Coincidence.
	Mean	. .	12 46	64.296	78.885	12 43	170.2					
	TITAN	280	0 56	49.610	64.282*	13 1	170.1	. .	3 A	.	D.	Chron. corr., — $5^{m}.1$.
			58	.605	.289*	3	170.0					Changed the micrometer slightly. Parallel, 186°.3 (Ver. I).
	Mean	. .	12 52	49.608	64.286	12 57	170.0					* Coincidence.
8	. . . .	. .	. .	. .	. .	. .	. .	. .	. .	.	.	By transits of an equatorial star the above zero for Ver. I comes out 186°.33, and this is to be used on August 5th.
	TITAN	60	10 48	56.999	71.368	10 41	213.7	. .	3 A	2	H.	Chron. corr., = 0^{m}.
				57.104	.409		213.3					
				57.000	.427		213.9					
			10 57	57.000	.465	10 45	213.6					
	Mean	. .	10 52	57.026	71.417	10 43	213.6					
	ENCELADUS . . .	280	11 5	60.479	67.940	11 0	182.2	. .	3 A	3	H.	Chron. corr., = 0^{m}.
				.460	68.014		182.8					
				.491	.010		183.1					
			11 13	.430	.061	11 3	182.2					
	Mean	. .	11 09	60.465	68.006	11 02	182.6					
	TETHYS	80	11 22	61.057	67.480	11 17	194.3	. .	3 A	3	H.	Chron. corr., = 0^{m}.
				.045	.478		193.6					
				.040	.488		193.0					
			11 31	.070	.430	11 21	193.2					
	Mean	. .	11 26	61.053	67.469	11 19	193.3					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Aug. 8	HYPERION	280	11 41	64.270*	83.230†	11 35	171.9	. .	3 A	3	H.	Chron. corr., = 0^{m}. * Coincidence. † HYPERION.
			54	.255*	.228†		171.4					
			55	.265*	.225†		171.5					
			11 57	.257*	.140†	38	171.5					
	Mean	. .	11 52	64.262	83.206	11 36	171.6					
	JAPETUS	270	12 8	51.402	77.095	12 2	182.4	. .	3 A	3	H.	Chron. corr., = 0^{m}.
				.492	.104		182.5					
				.375	.113		182.6					
			12 16	.447	.087	12 6	182.5					
	Mean	. .	12 12	51.429	77.100	12 4	182.5					
	DIONE	30	12 29	62.797	65.692	12 22	243.3	. .	3 A	3	H.	Chron. corr., = 0^{m}.
				.810	.685		243.1					
				.806	.730		242.1					
			12 37	.775	.730	12 25	243.5					
	Mean	. .	12 33	62.797	65.709	12 24	243.0					
	RHEA	330	12 50	62.171	66.450	12 44	124.2	. .	3 A	3	H.	Chron. corr., = 0^{m}. At first bad images, but became better. Some haze and clouds. Object observed for MIMAS was nearly in major axis of ring.—H.
				.185	347		123.7					
				.113	.419		124.7					
			12 57	.168	.400	12 47	123.7					
	Mean	. .	12 54	62.159	66.404	12 46	124.1					
25	HYPERION? . . . (Very faint.)	265	10 32	64.290*	81.936	10 25	189.8	. .	3 A	2	H.	Chron. corr., — $0^{m}.6$. * Coincidence.
				.280*	.943		189.7					
				.292*	.968		190.0					
			10 37	.283*	.990	10 29	189.6					
	Mean	. .	10 34	64.286	81.959	10 26	189.8					
	TITAN	80	10 51	50.576	77.906	10 45	193.6	. .	3 A	3	H.	Chron. corr., — $0^{m}.6$.
				.590	.935		193.1					
				.630	.915		193.3					
			11 3	.606	.973	10 49	193.6					
	Mean	. .	10 56	50.600	77.932	10 46	193.4					
	TETHYS	80	11 19	60.963	67.566	11 14	192.1	. .	3 A	2	H.	Chron. corr., — $0^{m}.6$.
				.900	.596		191.9					
				.972	.604		192.7					
			11 28	.872	.565	11 16	192.3					
	Mean	. .	11 23	60.927	67.583	11 14	192.2					
	DIONE	85	11 37	58.438	70.092	11 30	181.9	. .	3 A	2	H.	Chron. corr., — $0^{m}.6$.
				.403	.080		181.8					
				.409	.119		182.5					
			11 45	.451	.066	11 34	182.0					
	Mean	. .	11 40	58.425	70.089	11 31	182.0					
	RHEA	270	11 52	55.945	72.498	11 47	181.3	. .	3 A	2	H.	Chron. corr., — $0^{m}.6$. Found parallel (Ver. I) = 186°.3. Images of SATURN generally bad. There were two objects near each other, and observed more distant one for HYPERION; both faint and difficult to observe. Noticed again that JAPETUS is much fainter on the following side of SATURN.—H.
				.960	.580		181.3					
				.915	.518		181.2					
			12 4	.963	.542	11 50	181.2					
	Mean	. .	11 57	55.946	72.535	11 48	181.2					
26	DIONE	250	10 52	61.310	67.287	10 47	204.6	. .	3 A	2	H.	Chron. corr., — $0^{m}.6$.
				.234	.205		203.7					
				.220	.296		203.0					
			11 0	.213	.232	10 50	204.0					
	Mean	. .	10 55	61.244	67.255	10 48	203.8					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Aug. 26	TETHYS	260	11 7 11 15	60.399 .350 .374 .312	68.118 .113 .124 .175	11 2 11 5	188.9 190.2 190.0 189.4	. .	3 A	3	H.	Chron. corr., — $0^{m}.6$.
	Mean	. .	11 10	60.359	68.132	11 3	189.6					
	MIMAS	295	11 43 11 48	61.660 .664	66.853 .874	11 37 11 41	169.0 169.2 169.1 168.4	. .	3 A	2	H.	Very faint object. Chron. corr., — $0^{m}.6$.
	Mean	. .	11 45	61.662	66.864	11 38	168.9					
	ENCELADUS . . .	320	11 55 12 3	61.448 .511 .514 .490	67.220 .064 .091 .093	11 50 11 53	140.2 141.1 141.4 140.7	. .	3 A	2	H.	Chron. corr., — $0^{m}.6$.
	Mean	. .	11 58	61.491	67.117	11 51	140.8					
	HYPERION	270	12 12 12 15	64.284 .271 .269 .292	83.804 .750 .810 .776	12 5 12 9	186.8 186.2 186.9 186.0	. .	3 A	2	H.	Chron. corr., — $0^{m}.6$. There are two very faint objects a little above HYPERION and nearly at the same distance. Images bad tonight (Aug. 26).
	Mean	. .	12 13	64.279	83.785	12 6	186.5					
29	HYPERION	280	10 38 10 42	64.275 .262 .278 .277	84.175 .150 .204 .090	10 33 10 35	172.6 173.2 173.3 172.8	. .	3 A	3	H.	Parallel, = 186°.37 (by three transits, Ver. I). Chron. corr., — $0^{m}.6$.
	Mean	. .	10 39	64.273	84.155	10 33	173.0					
30	DIONE	45	11 2 11 8	62.344 .346 .357 .280	66.248 .182 .256 .208	10 56 11 0	224.5 223.4 223.0 222.0	. .	3 A	2	H.	
	Mean	. .	11 4	62.332	66.223	10 57	223.2					
	TITAN	120	11 16 25 28	54.396 .440 .362	74.160 .168 .125	11 10 11 14	156.2 156.0 156.6 155.9	. .	3 A	2	H.	
	Mean	. .	11 23	54.399	74.151	11 11	156.2					
	TETHYS	275	11 38 42	59.700 .691	68.785 .800	11 31 11 34	177.1 178.1 179.2 178.4	. .	3 A	2	H.	
	Mean	. .	11 39	59.695	68.792	11 32	178.2					
	ENCELADUS . . .	275	11 43 47	60.605 .660	67.789 .879	. .	. .	. .	3 A	2	H.	Same position angle as TETHYS, + 1°. Very faint.
	Mean		11 44	60.632	67.834	11 40	177.2					
	RHEA	285	11 57 12 5	57.307 .331 .294 .322	71.212 .260 .218 .168	11 52 11 56	170.7 170.5 170.5 170.7	. .	3 A	2	H.	HYPERION was seen at first, but the sky became so thick that it disappeared. Bad image of SATURN at first, but much better after haze came on. Chron. corr., — $0^{m}.6$.
	Mean		12 0	57.314	71.214	11 53	170.6					
31	HYPERION	310	10 0 10 4	52.029 .102 .190 .198	64.290 .266 .267 .310	9 53 9 57	157.4 156.0 156.3 156.5	. .	3 A	2	H.	Satellite faint.
	Mean	. .	10 1	52.130	64.283	9 54	156.5					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
1875.		°	h. m.	r.	r.	h. m.	°	°				
Aug. 31	RHEA	40	10 14	61.149	67.398	10 9	. .	215.5	3 A	3	H.	
				.165	.383			216.3				
				.097	.400			215.6				
			10 20	.202	.363	10 12		215.8				
	Mean	. .	10 16	61.153	67.386	10 10	. .	215.8				
	TETHYS	95	10 31	59.716	68.696	10 26	177.7	. .	3 A	3	H.	
			—	.821	.670		178.2					
				.808	.684		177.8					
			10 38	.831	.653	10 29	177.7					
	Mean	. .	10 34	59.794	68.676	10 27	177.8					
	DIONE	120	10 43	60.649	67.860	10 39	160.8	. .	3 A	3	H.	
				.697	.821		162.1					
				.690	.864		161.6					
			10 50	.678	.824	10 42	161.0					
	Mean	. .	10 46	60.678	67.842	10 40	161.4					
	TITAN	170	11 0	59.386	69.211	10 53	114.5	. .	3 A	3	H.	
				.369	.200		114.1					
				.420	.155		115.0					
			11 6	.330	.177	10 56	114.7					
	Mean	. .	11 2	59.376	69.186	10 54	114.6					
	SATURN . . . . (Maj. axis of ring).	. .	. .	59.774	68.765	. .	. .	. .	3 A	3	H.	From $10\frac{1}{2}^h$ to $11\frac{1}{2}^h$ the seeing was very good. Division of rings steady and could be traced nearly all around.—Belts on ball distinctly seen, but no marking on this light part of ball such as Mr. Russell, of Sydney, reports.—Dusky ring well seen.—Chron. corr., — $0^m.6$.
				.861	.754							
			11 20	.830	.688							
				.870	.702							
	Mean	. .	. .	59.834	68.727	. .	91.6					
	(Maj. axis of 2d ring).	. .	. .	60.528	68.024	. .	. .	. .	3 A	3	H.	
			11 28	.512	.011							
				.500	.060							
	Mean	. .	. .	60.513	68.032	. .	91.6					
	(Maj. axis of dusky ring).	. .	. .	61.474	67.071	. .	. .	. .	3 A	3	H.	
			11 38	.470	.115							
				.456	.109							
	Mean	. .	. .	61.467	67.098	. .	91.6					
	Diameter of Saturn .	. .	. .	62.342	66.257	. .	. .	. .	3 A	3	H.	
			11 52	.314	.201							
				.294	.242							
	Mean	. .	. .	62.317	66.233	. .	91.6					
	Other diameter . .	. .	. .	62.460	66.104	. .	. .	. .	3 A	2	H.	
			12 1	.455	.060							
				.515	.124							
	Mean	. .	. .	62.477	66.096	. .	181.6					
Sept. 1	ENCELADUS . . .	90	9 38	60.790	67.751	9 33	184.1	. .	3 A	3	H.	At times SATURN very good. All the satellites seen to-night. HYPERION being near SATURN it was very faint, but steadily seen. Chron. corr., — $0^m.7$.
				.778	.676		184.0					
				.736	.763		184.1					
			9 44	.770	.636	9 35	184.2					
	Mean	. .	9 40	60.768	67.707	9 33	184.1					
	RHEA	95	9 52	56.064	72.440	9 48	178.9	. .	3 A	3	H.	
				.000	.401		178.2					
				.077	.374		178.6					
			10 1	.107	.429	9 50	178.8					
	Mean	. .	9 56	56.062	72.411	9 48	178.6					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Sept. 1	TITAN	220	10 11	57.536	70.924	10 6	219.9	. .	3 A	3	H.	
				.576	.925		220.7					
			10 17	.582	.918		221.1					
						10 9	220.8					
	Mean	. .	10 13	57.565	70.922	10 7	220.6					
	DIONE	275	10 23	58.295	70.193	10 19	178.5	. .	3 A	3	H.	
				.286	.222		178.8					
			10 29	.320	.234		179.0					
						10 21	178.8					
	Mean	. .	10 25	58.300	70.216	10 19	178.8					
	TETHYS (?)	280	10 34	60.028	68.510	10 30	174.9	. .	3 A	3	H.	
				.020	.530		175.5					
			10 39	.026	.565		175.3					
						10 32	175.7					
	Mean	. .	10 36	60.025	68.535	10 30	175.3					
	TETHYS (?)	300	10 46	59.658	68.896	10 41	154.2	. . .	3 A	3	H.	
				.682	.875		153.5					
			10 56	.670	.866		153.3					
						10 44	153.0					
	Mean	. .	10 50	59.670	68.879	10 42	153.5					
	HYPERION	320	11 40	64.274	71.480	11 34	131.3	. .	3 A	.	H.	
			43	.272	.465		129.1					
							130.2					
						11 38	130.2					
	Mean	. .	11 41	64.273	71.472	11 35	130.2					
2	DIONE	80	10 23	60.019	68.539	10 19	193.2	. .	3 A	3	H.	
				59.990	.530		192.5					
				.968	.500		192.3					
			10 32	.911	.533	10 21	192.8					
	Mean	. .	10 27	59.972	68.525	10 19	192.7					
	TETHYS	95	10 38	60.420	67.988	10 34	171.6	. .	3 A	2	H.	Images became so bad that I gave up observing. Chron. corr., — $0^m.7$.
				.465	.928		170.7					
			10 51	.508	68.053		171.5					
						10 37	171.2					
	Mean	. .	10 44	60.464	67.990	10 35	171.2					
3	*μ¹ Herculis* . . . . R. A. 17^h 42^m. Dec. + 27° 48′.	210	. .	64.148	64.383	8	57.9	. .	5 A	3	H.	Good images to-night. Suspected divisions in inner ring of SATURN, outside of dusky ring. Dusky ring and belts on the ball well seen. Chron. corr., — $0^m.7$.
				.144	.430		58.8					
				.144	.390		56.9					
							58.2					
	Mean			64.145	64.401		58.0					
	DIONE	160	9 42	62.830	65.744	9 36	298.2	. .	3 A	3	H.	
				.760	.755		297.0					
			9 47	.792	.770		296.8					
						9 40	296.4					
	Mean	. .	9 44	62.794	65.756	9 37	297.1					
	ENCELADUS . . .	270	9 51	60.996	67.586	9 48	6.7	. .	3 A	3	H.	
				.952	.635		7.0					
			9 55	.920	.653		7.1					
						9 50	7.2					
	Mean	. .	9 52	60.956	67.625	9 48	7.0					
	TETHYS	290	10 0	60.714	67.848	9 56	350.4	. .	3 A	3	H.	
				.804	.837		351.1					
			10 4	.751	.850		350.4					
						9 58	350.2					
	Mean	. .	10 1	60.756	67.845	9 56	350.5					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
1875.		°	h. m.	r.	r.	h. m.	°	°				
Sept. 3	Rhea	270	10 11	56.189	72.428	10 5	2.8	. .	3 A	3	H.	
				.160	.400		3.4					
			10 16	.171	.401		3.0					
						10 9	3.0					
	Mean	. .	10 13	56.173	72.410	10 6	3.0					
6	*μ*² *Herculis* . . . . $\left(\text{A and } \frac{B+C}{2}\right)$	240	. .	61.096	67.478	. .	31.8	. .	5 A	2	H.	Bad images.
				.151	.349		32.4					
				.118	.388		32.5					
				.151	.332		32.4					
	Mean	. .	7 45	61.129	67.387		32.3					
	Hyperion	85	10 15	64.287	85.965	10 8	9.0	. .	3 A	3	H.	
				86.250	.904		8.9					
				.253	86.050		8.6					
			10 19	.268	.028	10 11	8.8					
	Mean	. .	10 18	64.264	85.987	10 10	8.8					
	Tethys	140	10 36	62.850	65.638	10 29	311.7	. .	3 A	2	H.	Tethys faint.
			10 40	.938	.591		311.6					
							311.7					
						10 34	310.0					
	Mean	. .	10 39	62.894	65.614	10 32	311.2					
	Rhea	110	10 49	58.612	69.910	10 42	344.3	. .	3 A	3	H.	
				.630	.846		345.0					
			10 57	.638	.879		345.1					
						10 45	345.7					
	Mean	. .	10 54	58.627	69.878	10 44	345.0					
	Dione	260	11 13	60.498	67.972	11 6	18.0	. .	5 A	3	H.	
				.495	.952		17.0					
				.375	68.090		16.5					
			11 21	.441	.048	11 10	16.1					
	Mean	. .	11 18	60.452	68.015	11 9	16.9					
	Satellite of Neptune.	190	12 24	63.043	65.457	12 16	74.5	. .	5 A	3	H.	Poor images for Saturn. Neptune better, but satellite faint at an hour angle of 3^h. Chron. corr., $+ 0^m.6$.
				.030	.452		77.7					
				.100	.528		75.9					
				.086	.425		74.5					
			12 35	.058	.410	12 21	74.2					
	Mean	. .	12 30	63.063	65.454	12 19	75.4					
7	*μ*¹ *Herculis* (B and C)	220	. .	64.141	64.413	. .	. .	57.7	5 A	3	H.	At $10^h 35^m$ conjunction of Dione (?) with Saturn. Satellite is north, and very near edge of planet. Too much haze for Neptune's satellite. * Noticed a spider on the wires, and movable wire dragged on the other wire perpendicular to it, so this distance is uncertain. The spider has begun a web at 69 revolutions. Micrometer removed, cleaned, and re-adjusted. Chron. corr., $+ 0^m.6$.
				.172	.382			57.8				
				.140	.396			56.3				
				.158	.418			57.6				
	Mean	. .	. .	64.153	64.402			57.3				
	Rhea*	260	10 7	58.822	69.370	9 45	19.7	. .	5 A	3	H.	
				.760	.422		19.0					
				.735	.419		18.8					
			10 15	.733	.433	9 48	18.7					
	Mean	. .	10 12	58.762	69.411	9 47	19.0					
	Dione	315	10 22	62.080	66.410	10 17	324.5	. .	5 A	3	H.	
			10 27	.062	.395		324.5					
							325.2					
						10 29	223.6					
	Mean	. .	10 25	62.071	66.402	10 19	324.4					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Sept. 8	Triple star in Trifid Nebula. R. A. = 17h 55m. Dec. = — 23° 2′. A and B.	211	. .	63.158 .186	65.338 .329	. .	. .	. .	3 A	3	Hn.	Parallel from this date, inclusive, 346°.5.
	Mean	. .	. .	63.172	65.333							
	A and C . . .	23	. .	63.582 *[.652:] .569	64.868 .889	. .	. .	. .	.	3	Hn.	* Reject.
	Mean	. .	. .	43.576	64.879							
	B and E . . .	. .	. .	63.741 .655	64.841: .858	. .	. .	. .	.	1	Hn.	Setting for distances, 343° (Ver. I). The setting for distance should have been 334°. 0.576 sec. 9° = △ = 0.583 = 5.″80
	Mean	. .	. .	63.698	64.850							
	μ¹ HERCULIS * . .	220	. .	64.160 .170 .165	64.373 .380 .364	. .	. .	34.9 34.8 33.6 33.9	5 A	3	H.	* This is the best observation of distance.
	Mean	. .	. .	64.165	64.372	. .	. .	34.3				
	μ¹ HERCULIS . . .	. .	. .	. .	. .	. .	. .	31.7 31.2 29.8 29.8	5 A	.	N.	Parallel, 346°.5 (Ver. II). The North star decidedly the smaller, which surprises me, because last year it was extremely difficult to decide which was the smaller.—N. TETHYS near conjunction at 8h 45m, but I saw it too late.—H.
	Mean	. .	. .	. .	. .	. .	. .	30.6				
	TITAN	5	10 10 10 16	59.938 .910 .888	68.620 .620 .660	10 6 10 8	. .	72.7 72.4 72.4 72.5	3 A	3	H.	
	Mean	. .	10 14	59.912	68.633	10 8	. .	72.5				
	ENCELADUS . . .	110	10 21 10 26	61.121 .060 .121	67.490 .421 .470	10 17 10 20	331.1 332.4 331.8 332.6	. .	3 A	4	H.	The seeing very good at times, and fine images. It may be I have interchanged the names of ENCELADUS and TETHYS.
	Mean	. .	10 24	61.101	67.460	10 19	332.0					
	DIONE	110	10 34 10 40	58.951 59.022 .014	69.529 .506 .535	10 29 10 31	332.6 332.7 333.2 332.7	. .	3 A	4	H.	
	Mean	. .	10 38	58.996	69.523	10 31	332.8					
	TETHYS	225	10 47 10 51	62.860 .874 .880	65.634 .657 .680	10 41 10 44	. .	29.4 27.5 27.0 27.4	3 A	3	H.	
	Mean	. .	10 50	62.871	65.657	10 43	. .	27.8				
	RHEA	285	11 0 11 7	56.983 .967 .944	71.568 .565 .530	10 53 10 57	333.0 332.5 332.4 332.1	. .	3 A	4	H.	
	Mean	. .	11 4	56.965	71.554	10 56	332.5					
	Satellite of NEPTUNE .	30	11 54 12 3	62.560 .566 .564 .602 .565	65.950 .961 .913 .930 .973	11 46 11 52	34.6 35.0 34.8 35.3 35.4	. .	5 A	4	H.	Parallel (Ver. I) by NEPTUNE, = 346.°6. Chron. corr. + 0m.7.
	Mean	. .	11 59	62.571	65.945	11 50	35.0					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading.)	Microm. II (largest reading.)	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Sept. 9	*μ' Herculis*	220	. .	. .	. .	. .	36.6	. .	3 A	2	H.	Images poor.
							35.3					
							35.0					
							37.0					
	Mean	. .	. .	. .	. .	7 45	36.0					
	RHEA	45	8 44	61.780	66.651	8 37	. .	31.9	3 A	3	H.	
				.774	.680			32.7				
				.763	.746			32.7				
			8 51	.775	.674	8 41		31.9				
	Mean	. .	8 48	61.773	66.688	8 40	. .	32.3				
	TITAN	70	8 58	56.204	72.218	8 53	. .	10.6	3 A	4	H.	
				.187	.217			10.3				
				.265	.218			10.8				
			9 7	.230	.231	8 56		10.5				
	Mean	. .	9 3	56.222	72.221	8 55	. .	10.5				
	DIONE	265	9 21	58.958	69.531	9 16	346.4	. .	3 A	3	H.	
				58.960	.435		347.2					
				59.001	.541		346.3					
			9 31	58.995	.505	9 19	347.0					
	Mean	. .	9 27	58.978	69.503	9 18	346.7					
	TETHYS	45	9 40	62.880	65.659	9 33	24.0	. .	3 A	3	H.	
				.887	.681		25.3					
				.877	.721		25.5					
			9 45	.791	.688	9 37	25.5					
	Mean	. .	9 43	62.859	65.687	9 36	25.1					
	HYPERION	100	11 1	64.245	87.060	10 55	337.2	. .	3 A	3	H.	
				.246	.172		337.2					
				.250	.085		337.0					
			11 4	.247	.131	10 58	337.3					
	Mean	. .	11 3	64.247	87.112	10 57	337.2					
	Satellite of NEPTUNE.	10	12 15	63.051	65.483	11 59	. .	56.6	3 A	2	H.	For satellite of NEPTUNE haze, and satellite faint. Chron. corr., + $0^m.7$. Parallel = 346°.3.
				.102	.380	12 10		54.6				
				.109	.409	12 11		55.7				
				.021	.361	12 12		55.4				
			12 24	.101	.428	12 13		56.4				
	Mean	. .	12 20	63.077	65.412	12 10		55.7				
11	HYPERION	110	10 30	64.245	79.561	10 20	325.9	. .	3 A	2	H.	Object extremely faint, moonlight and haze. Chron. corr., + $0^m.7$.
				.239	.613		326.2					
				.250	.550		326.3					
			10 35	.247	.585	10 26	326.1					
	Mean	. .	10 33	64.245	79.577	10 24	326.1					
13	TETHYS	80	9 37	. .	68.107	. .	349.2	. .	5 A	2	Hn.	*Coincidence.
					*64.263		349.6					
							349.6					
							349.0					
	Mean	. .	. .	. .	. .	9 21	349.4					
	DIONE	75	9 40	. .	68.794	9 25	351.2	. .	5 A	2	Hn.	*Coincidence. Stopped by clouds.
					*64.263		351.3					
							351.3					
						9 30	350.4					
	Mean	. .	. .	. .	. .	9 28	351.1					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Sept. 14	*μ' Herculis*	220	. .	. .	. .	. .	32.0	. .	5 A	3	H.	
							34.8					
							32.9					
							33.7					
	Mean	. .	. .	. .	. .	. .	33.4					
	μ' Herculis	. .	. .	. .	. .	. .	39.3	. .	5 A	3	Hn.	* Half-weight.
							39.6					
							39.8					
							35.4					
							39.5*					
	Mean	. .	. .	. .	. .	. .	38.9					
	ENCELADUS . . .	270	8 32	61.077	67.425	8 28	348.4	. .	3 A	2	H.	
				.000	.441		348.6					
			39	60.940	.487		348.1					
						30	349.4					
	Mean	. .	8 36	61.006	67.451	8 30	348.6					
	TETHYS	270	9 15	59.958	68.502	8 41	347.4	. .	3 A	2	H.	
				.900	.425		347.5					
			20				348.4					
						44	347.9					
	Mean	. .	9 18	59.929	68.463	8 43	347.8					
	HYPERION	260	9 23	56.376	72.901	8 50	175.7	. .	3 A	2	H.	
				.535	.921		175.9					
							176.2					
			30			53	176.3					
	Mean	. .	9 27	56.455	72.911	8 52	176.0					
	RHEA	80	9 33	57.671	70.722	8 55	351.9	. .	3 A	2	H.	
			38	.617	.792		351.2					
							351.8					
						58	351.6					
	Mean	. .	9 36	57.644	70.757	8 57	351.6					
	JAPETUS	95	9 41	45.841*	. .	8 59	340.7	. .	3 A	2	H.	* From wire A.
				[46.]060			341.0					
							341.2					
						9 1	340.8					
	Mean	. .	9 42	45.950		9 1	340.9					
	TITAN	115	9 46	49.372*		9 4	328.7	. .	3 A	2	H.	* From wire A.
				.362			328.2					
							328.3					
						9 7	328.3					
	Mean	. .	9 47	47.367		9 6	328.4					
	DIONE	180	9 53	62.881	65.728	9 9	73.0	. .	3 A	2	H.	Chron. corr., + $1^m.0$. Angles of position of all but last one fair, but distances are uncertain, as clock did not perform well.—H.
			57	.870	.641		75.2					
							75.5					
						9 12	74.6					
	Mean	. .	9 56	62.876	65.684	9 11	74.6					
16	JAPETUS	100	9 2	54.136	74.299	8 48	335.4	. .	3 A	3	H.	Chron. corr., − $0^m.1$. A faint object under and near the ring on following side, but the seeing became too bad for measurements of it (TETHYS).—H.
				.136	.375		335.9					
				.094	.355		335.5					
			9 14	.104	.329	8 59	336.3					
	Mean	. .	9 8	54.118	74.340	8 53	335.8					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
1875.		°	h. m.	r.	r.	h. m.	°	°				
Sept. 16	DIONE	85	9 24	58.494	70.075	9 18	342.4	. .	3 A	3	H.	
				.502	69.960		342.0					
			9 31	.498	70.033		341.6					
						9 21	341.7					
	Mean	. .	9 27	58.498	70.023	9 19	341.9					
	TITAN	160	9 44	59.530	69.048	9 35	. .	90.8	3 A	2	H.	
				.429	.107			90.7				
				.460	.038			90.8				
			9 55	.435	.121	9 39		90.4				
	Mean	. .	9 50	59.464	69.078	9 37		90.7				
	RHEA	250	10 4	59.382	69.050	9 57	0.0	. .	3 A	2	H.	
				.404	.095		359.1					
			10 13	.360	.114		359.6					
						10 1	358.6					
	Mean	. .	10 8	59.382	69.086	9 59	359.3					
	ENCELADUS . . .	275	10 26	59.612	68.835	10 19	338.6	. .	3 A	2	H.	
			10 31	.667	.812		339.8					
							338.2					
						10 23	338.6					
	Mean	. .	10 28	59.639	68.823	10 21	338.8					
19	*α*² *Capricorni*, Comp. .	250	. .	64.130	64.361	. .	13.7	. .	3 A	2	H.	Distance only approximate.
							10.8					
							10.0					
							9.2					
	Mean	. .	. .	. .	. .	. .	11.2					
	HYPERION	275	8 12	64.257	84.790	8 6	334.3	. .	3 A	3	H.	
					.715		334.5					
					.721		334.3					
			8 16		.784	8 9	334.5					
	Mean	. .	8 14	. .	84.752	8 7	334.4					
	JAPETUS	225	8 30	60.675	67.810	8 19	. .	201.1	3 A	4	H.	
				.671	.825			199.9				
			8 36	.669	.815			200.2				
						8 24		200.8				
	Mean	. .	8 33	60.672	67.817	8 21	. .	200.5				
Sept. 19	ENCELADUS . . .	100	8 45	60.928	67.615	8 38	333.8	. .	3 A	3	H.	
				.892	.530		334.2					
			8 54	.900	.540		333.7					
						8 42	334.8					
	Mean	. .	8 49	60.907	67.562	8 40	334.1					
	TETHYS	100	9 2	60.111	68.262	8 56	334.3	. .	3 A	3	H.	
				.226	.302		333.4					
			9 8	.210	.311		334.3					
						9 6	334.2					
	Mean	. .	9 5	60.182	68.292	8 58	334.0					
	DIONE	100	9 19	59.061	69.420	9 14	332.8	. .	3 A	3	H.	
				.106	.427		333.0					
				.052	.411		333.1					
			9 26			9 18	333.0					
	Mean	. .	9 22	59.073	69.419	9 16	333.0					
	RHEA	95	9 33	56.224	72.361	9 29	339.4	. .	3 A	3	H.	
				.150	.337		340.1					
				.183	.319		340.0					
			9 40			9 32	339.6					
	Mean	. .	9 37	56.152	72.339	9 30	339.8					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Sept. 19	TITAN	270	9 51 9 54	64.254 .258 .263 .253	80.920 .930 .974	9 43 9 48	347.2 346.9 346.7 346.7	. .	3 A	3	H.	Parallel, 346°.4 (Ver. I).
	Mean	. .	9 52	64.257	80.941	9 45	346.9					
	34 *Pegasi* . . . . $22^h 14^m$. + 5° 11′.	225	. .	64.013 63.974	64.510 .508	. .	30.8 29.7 31.3 30.1	. .	3 A	3	H.	Distance uncertain. Chron. corr., $0^m.0$. A fair night, but not very good for close objects.
	Mean	. .	. .	63.994	64.509	. .	30.5					
20	Space between Ball and Ring.	. .	. .	0.839 .877	1.651 1.642	. .	. .	. .	3 A	.	N.	
	Mean	. .	. .	0.858	1.646							
	Width of Ring . .	. .	. .	0.095 .995	0.513 .485	. .	. .	. .	3 A	.	N.	Images very bad.
	HYPERION	285	9 38 9 42	46.544 .604 .629 .716	64.257*	9 28 9 32	148.8 148.6 148.4 148.2	. .	3 A	2	H.	* Coincidence.
	Mean	. .	9 40	46.623	64.257	9 30	148.5					
	JAPETUS	260	9 55 10 0	56.573 .552	71.938 72.030	9 49 9 52	181.0 181.1 180.7 180.9	. .	3 A	2	H.	
	Mean	. .	9 57	56.562	71.984	9 50	180.9					
	30 *Pegasi* . . . . $22^h 14^m$ + 5° 11′. A and B.	30	. .	63.608 63.594	64.876 64.830	. .	236.4 235.1 234.8 235.2	. .	3 A	3	H.	
	Mean	. .	. .	63.601	64.853	. .	235.4					
	30 *Pegasi* . . . . A and C.	210	. .	63.286 .246	65.219 .214	. .	214.3 215.8 215.3 215.2	. .	A	3	H.	
	Mean	. .	. .	63.266	65.216	. .	215.2					
	Satellite of NEPTUNE .	30	11 49 11 58	62.516 .384 .540 .480	65.883 .958 .928 66.004	11 41 11 48	39.4 39.9 38.8 38.0 39.9	. .	5 A	2	H.	
	Mean	. .	11 53	62.480	65.943	11 44	39.2					
24	HYPERION	35	10 1	56.003	. .	9 50 9 58	15.6 15.0 15.4 16.2	. .	3 A	.	H.	Parallel, 156°.3 (Ver. I). Clock failed.
	Mean	. .	. .	. .	. .	9 54	15.5					
29	HYPERION	95	8 22 8 27	64.243 .238 .240 .235	87.853 .925 .945 .889	8 14 8 18	326.3 326.1 326.1 326.4	. .	3 A	4	H.	Parallel, 330°.3 (Ver. I), by TITAN.
	Mean	. .	8 24	64.239	87.903	8 16	326.2					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
1875.		°	h. m.	r.	r.	h. m.	°	°				
Sept. 29	DIONE	350	10 15	62.876	65.634	10 5	67.0	. .	3 A	3	H.	
			10 20	.845	.622		67.4					
							65.0					
						10 12	67.2					
	Mean	. .	10 17	62.860	65.628	10 8	66.7					
	RHEA	160	10 33	61.940	66.551	10 22	. .	86.6	3 A	3	H.	
			10 37	.960	.516			85.2				
								84.2				
						10 30		83.6				
	Mean	. .	10 35	61.950	66.533	10 26	. .	84.9				
	TETHYS.	260	10 52	60.385	68.151	10 39	334.1	. .	3 A	3	H.	
			10 58	.358	.190		332.4					
							333.6					
						10 43	334.0					
	Mean	. .	10 55	60.371	68.170	10 41	333.5					
	* ENCELADUS . . .	262	11 5	60.804	67.550	10 44	331.5	. .	3 A	2	H.	* This object *very faint* at time of distance-observation.
			11 11	60.811	67.640		331.3					
						46	332.0					
	Mean	. .	11 8	60.808	67.595	10 45	331.6					
	Satellite of NEPTUNE.	210	11 48	62.609	65.896	11 36	24.5	. .	5 A	3	H.	Sky became thick and satellite very faint during measures of distance. Chron. corr., — 0m.2.
				.591	.835		26.2					
				.612	.892		26.5					
			12 13	.560	.868		24.3					
						11 44	24.7					
	Mean	. .	12 00	62.593	65.873	11 40	25.2					
Oct. 2	ENCELADUS . . .	275	8 20	60.616	67.743	8 13	354.6	. .	3 A	3	H.	
				.709	.734		354.7					
				.714	.720		354.2					
			8 29	.723	.770	8 17	353.5					
	Mean	. .	8 24	60.690	67.742	8 15	354.2					
	HYPERION	110	8 42	47.519	64.251	8 34	343.6	. .	3 A	3	H.	
				.465	.251		344.0					
				.510	.259		344.2					
			8 49	.526	.249	8 39	343.9					
	Mean	. .	8 45	47.505	64.252	8 36	343.9					
	DIONE	60	9 4	61.544	66.959	8 58	24.2	. .	3 A	3	H.	
				.435	67.040		22.8					
				.431	.059		22.6					
			9 15	.438	.016	9 1	22.9					
	Mean	. .	9 10	61.462	67.018	9 0	23.1					
	RHEA	75	9 24	58.292	70.169	9 18	9.0	. .	3 A	3	H.	Another satellite in p. = 90°, and TITAN in p. = 175°.
				.250	.252		9.2					
			9 30	.247	.261		9.1					
						9 22	8.7					
	Mean	. .	9 27	58.263	70.227	9 20	9.0					
	TETHYS	90	10 25	59.812	68.609	10 21	357.3	. .	3 A	3	H.	
			10 31	.748	.695		356.6					
						10 24	356.8					
	Mean	. .	10 28	59.780	68.652	10 23	356.9					
	TITAN	180	. .	. .	. .	10 33	. .	96.4	3 A	3	H.	
								95.0				
								95.8				
						10 37		95.8				
	Mean	. .	. .	. .	. .	10 35	. .	95.7				

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.			Eye-piece.	Image.	Observer.	Remarks.
							Index.	Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°	°				
1875. Oct. 2	Satellite of NEPTUNE.	30	11 0 11 12	62.554 .545 .534 .569 .544	65.951 .936 .900 .915 .975	10 50 10 56	. .	59.2 59.3 58.0 57.9 58.0	. .	3 A	3	H.	
	Mean	. .	11 6	62.549	65.935	10 53	. .	58.5					
	Satellite of NEPTUNE.	30	11 30 11 55	.558 .537 .517 .534	.030 .873 .940 .002	. .	. .	. .	. .	5 A	2	Hn.	Parallel = 2°.3. Chron. corr., 0m.0.
	Mean	. .	11 43	.537	.961								
3	HYPERION	130	7 46 7 51	52.448* .434 .470 .454	64.255† .252 .246 .253	7 37 7 42	. .	334.1 333.6 334.6 334.4	. .	3 A	3	H.	*Single distance. †Coincidence. The glare around SATURN extends nearly 3′ from the planet, with power 600 A; and this makes it difficult to see faint objects near the planet with this power. With power 400 A the glare is not so marked and faint; objects like HYPERION to-night are better seen with 400 A. The seeing better than average to-night, and I tried several eye-pieces. The best seeing for HYPERION was with 400 A, but 600 A was best for the belts and rings.—H.
	Mean	. .	7 48	52.451	64.252	7 39	. .	334.2					
4	a^1 *Capricorni* . . . 20h 11m — 12° 56′ A and C.	180	. .	. .	. .	. .	. .	89.6 90.4 91.5	. .	3	3	Hn.	Measures taken without clock-work motion. Clock-work failed. Magnitudes 3 and 16.
	Mean	. .	. .	. .	. .	. .	. .	90.5					
5	RHEA	275	. .	. .	. .	8 10	. .	353.3	. .	3 A	3	H.	
	Satellite of NEPTUNE.	210	. . 10 46 48	. .	65.658 .643 .739 .683	10 18 26 28 31	. .	59.7 59.6 59.9 59.9	. .	5 A	5	Hn.	Setting for distances, 2°.3 (Ver. I).
	Mean	. .	10 46		65.681	10 26	. .	59.8					
	Satellite of NEPTUNE.	. .	10 56 11 6 12	62.508 .552 .622	66.006 65.880 .901	. .	. .	. .	. .	5 A	5	Hn.	Setting for distances, 330° (Ver. I). The angles of position measured without clock-work. Chron. corr., + 1m for NEPTUNE observations. The first set of distances are differences of δ from which s = 1.692 = 16″.83. The second set measured as usual with clock-work s = 1.684 = 16″.75.
	Mean	. .	11 5	62.561	65.929								
7	Satellite of NEPTUNE.	40	. .	. .	. .	10 27 35 38 43	138.2: 133.7 131.9 138.8	. .	. .	3 5 A 5 A 5 A	1	Hn.	Measures taken with great difficulty. Planet very unsteady. Satellite only visible by moments. Chron. corr., = 0m for NEPTUNE obs. 11h 30m. Satellite not visible.
	Mean	. .	. .	. .	. .	10 35	135.7						
9	Satellite of NEPTUNE.	290	. .	. .	. .	. .	. .	. .	. .	.	.	Hn.	Not visible from 12h to 14h.
12	Satellite of NEPTUNE.	. .	. .	. .	. .	. .	. .	. .	. .	.	.	Hn.	Telescope *west* of pier. At 10h satellite only once seen in p = 100° (est.) Moonlight strong, and images of NEPTUNE unsteady.

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.			Eye-piece.	Image.	Observer.	Remarks.
							Index.	Ver. I.	Ver. II.				
1875.		°	h. m.	r.	r.	h. m.	°	°	°				
Oct. 13	Satellite of NEPTUNE.	40	9 34	62.750	. .	9 19	230??	. .	. .	5 A	2	Hn.	Telescope *west* of pier. Satellite hardly visible with 600 A, and 2 first measures of angle of position taken with 600 A are worthless. All the other measures of *p* and *s* are taken with 800 A, with which the seeing is decidedly better. Moon close, and images quite unsteady.—Hn. * Mean. † Mean.
				.793			228??			&			
			40	.838:						6 A			
				.885:			225.4						
			44	.785		9 27	222.8						
			47	.798			222.4						
				.830									
			53	.811		9 27*	223.5*						
			10 1	.752									
			3	.816		9 55	223.2						
							222.4						
							223.0						
						10. 0	224.4						
	Mean	. .	9 48	62.806		9 58†	223.3†						
16	Satellite of NEPTUNE.	210	10 54	62.657	65.773	10 39	223.3	. .	. .	6 A	2	Hn.	Satellite easily seen, but images very unsteady. Moonlight and high wind. Parallel about 1°. Chron. corr., + 1^{m}.
				.668	.855		224.8						
			11 12	.611	.792		225.6						
							225.3						
						10 49	225.2						
	Mean	. .	11 4	62.645	65.807	10 45	224.8						
17	HYPERION	70	7 33	64.246	78.555	7 25	. .	196.8	. .	3 A	3	H.	
				.252	.627			197.0					
				.242	.650			196.6					
			7 37	.254	.608	7 30		196.2					
	Mean	. .	7 36	64.249	78.610	7 28	. .	196.6					
	TETHYS	80	7 49	61.030	67.486	7 45	. .	189.4	. .	3 A	4	H.	
				.012	.491			188.8					
				.000	.554			188.9					
			7 57	60.972	.452	7 47		189.5					
	Mean	. .	7 54	61.004	67.496	7 47	. .	189.1					
	TITAN	120	8 10	55.440	73.083	8 3	. .	147.9	. .	3 A	3	H.	
				.416	.060			148.5					
			8 21	.422	.077			147.8					
						8 7		147.6					
	Mean	. .	8 16	55.426	73.073	8 6	. .	147.9					
	RHEA	125	8 30	60.944	67.587	8 23	. .	142.1	. .	3 A	3	H.	
				.946	.492			143.7					
				61.016	.530			141.0					
			8 38	60.958	.545	8 27		141.5					
	Mean	. .	8 35	60.966	67.538	8 26	. .	142.1					
	DIONE	235	8 48	62.018	66.343	8 40	. .	. .	215.4	3A	3	H.	
				61.988	.390				213.8				
				.996	.415				215.5				
			8 55	62.027	.449	8 44			213.9				
	Mean	. .	8 52	62.007	66.399	8 43			214.6				
	ENCELADUS . . .	275	9 11	60.743	67.869	9 0	. .	173.4	. .	3 A	2	H.	Chron. corr., + $0^{\mathrm{m}}.9$. At $7^{\mathrm{h}}\ 45^{\mathrm{m}}$ seeing very good; became worse, and ENCELADUS very faint and difficult to see on account of haze.—H.
			17	.682	.720	3		173.2					
						5		174.5					
						6		175.0					
	Mean	. .	9 15	60.712	67.794	9 4	. .	174.0					
	Satellite of NEPTUNE.	180	12 8	62.841	65.631	11 49	. .	246.0	. .	6 A	3	Hn.	Telescope *west* of pier. Chron. corr., = 0^{m}. Sky generally hazy. Images unsteady, but observations pretty satisfactory.
				.803	.703			246.8					
			23	Clouds	.623			247.8					
			28	.860				248.5:					
			35	.882	.622	11 59		246.4					
	Mean	. .	12 22	62.847	65.645	11 54		247.1					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Oct. 19	HYPERION	90	7 54	64.259	85.345	7 48	183.9	. .	3 A	3	H.	
				.250	.374		183.7					
				.247	.356		184.2					
			7 59	.245	.330	7 51	184.1					
	Mean	. .	7 57	64.250	85.351	7 50	184.0					
	Satellite of NEPTUNE.	40	9 39	62.710	65.802	9 26	225.6	. .	6 A	4	Hn.	For NEPTUNE, telescope *west* of pier.
				.738	.823		226.9					Chron. corr., + 0^m.6.
				.708	.767		226.0					
				.698	.756		225.9					
			10 4	.710	.812	9 33.5	225.8					
	Mean	. .	9 52	62.713	65.792	9 30	226.0					
20	HYPERION	93	7 8	64.241	86.798	6 59	180.4	. .	3 A	2	H.	
				.240	.748		179.9					
				.241	.691		180.0					
				.242	.830	7 5	180.2					
			7 15	.240	.700							
	Mean	. .	7 12	64.241	86.753	7 2	180.1					
	30 *Pegasi*	30	. .	63.648	64.874	. .	. .	254.4	3 A	3	H.	
	A and B.			.601	.880			254.3				
	22^h 14^m + 5° 11′			.515	.840			254.0				
				.582	.877			255.6				
	Mean	. .	. .	63.586	64.868	. .	. .	254.6				
	30 *Pegasi*	230	. .	63.226	65.242	. .	. .	228.7	3 A	3	H.	Chron. corr., + 0^m.4.
	A and C.			.216	.272			231.1				
				.266	.225			230.8				
				.282	.225			231.0				
	Mean	. .	. .	63.248	65.241	. .	. .	230.4				
	Satellite of NEPTUNE.	20	11 2	62.918	65.681	10 45	247.3	. .	6 A	2	Hn.	For satellite of NEPTUNE, telescope *west* of pier.
				.830	.698		247.1					Chron. corr., + 0^m 39^s.
			11 19	.855	.613		247.7					Images diffused and unsteady. (NEPTUNE obs.).
						10 53	248.4					
	Mean	. .	11 11	62.868	65.664	10 50	247.6					
21	HYPERION	95	8 5	41.497	64.250	7 55	176.2	. .	3 A	3	H.	Parallel by TITAN = 182°.2.
				.430	.252		176.0					
				.485	.256		175.7					
			8 10	.494	.255	8 1	176.3					
	Mean	. .	8 8	41.477	64.253	7 58	176.0					
22	HYPERION	98	7 36	43.012	64.243	7 29	172.0	. .	3 A	4	H.	
				.102	.253		172.4					
				.055	.245		172.2					
			7 40	.084	.253	7 33	172.3					
	Mean	. .	7 38	43.063	64.249	7 31	172.2					
	* ENCELADUS . . .	110	7 51	61.585	66.832	7 47	162.8	. .	3 A	3	H.	* This object very faint.
			57	.592	.850		163.0					
							161.8					
						7 50	162.5					
	Mean	. .	7 54	61.588	66.841	7 49	162.5					
	DIONE	110	8 3	59.946	68.530	7 59	162.9	. .	3 A	3	H.	
				.970	.493		163.6					
				60.014	.492		163.0					
			8 10	.035	.465	8 2	164.0					
	Mean	. .	8 7	59.991	68.495	8 1	163.4					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
1875.		°	h. m.	r.	r.	h. m.	°	°				
Oct. 22	RHEA	230	8 19 8 24	61.206 .232 .198	67.252 .235 .240	8 14 8 17	215.2 213.8 213.4 213.7	. .	3 A	4	H.	
	Mean	. .	8 22	61.212	67.242	8 16	214.0					
	TETHYS	275	8 29 8 34	59.958 .996 60.006	68.503 .496 .452	8 25 8 27	173.1 172.8 172.3 173.0	. .	3 A	4	H.	
	Mean	. .	8 32	59.987	68.484	8 26	172.8					
	Satellite of NEPTUNE.	220	10 39 10 54	62.512 .560 .546	65.886 .957 .941	10 27 10 34	229.0 229.3 227.3: 229.1	. .	6 A	4	Hn.	For satellite of NEPTUNE, telescope *west* of pier; very steady, but faint. Chron. corr., + 0m.5.
	Mean	. .	10 47	62.539	65.928	10 31	228.7					
24	HYPERION	115	6 27 6 30	64.256 .255 .263 .254	77.772 .835 .800 .748	6 18 6 23	159.9 160.7 159.9 159.8	. .	3 A	4	H.	
	Mean	. .	6 31	64.257	77.789	6 23	160.1					
	Ring Nebula in *Lyræ* R. A. 18h 48m. Dec. + 32° 54′.	70	. .	*54.353† .309 .324	*60.393† .329 .385	. .	208.5‡ 206.4 210.4 209.0	. .	5 A	4	Hn.	* Minor axis. † Micrometer wire. ‡ Angle of position of major axis.
	Mean	. .	. .	54.329	60.369	. .	208.6					
	Ring Nebula . . .	. .	9 0	49.820*	58.733*	. .	. .	. .	5 A	3	Hn.	* Major axis. Clouds. Minor axis more sharply terminated on north side, near north end of minor axis is a bright patch. Lord Ross's (?) star inside of ring seen occasionally; the whole of this interior glistening in points. At south end of minor axis filaments of nebulæ extend 15″ to 30″ off. Following end of major axis better terminated than preceding.—HN. Chron. corr., + 2m.3.
25	JAPETUS	275	6 32 6 36	48.954 .935 .954 .995	64.246 .245 .251 .252	6 25 6 29	174.4 174.6 174.5 174.7	. .	3 A	4	H.	
	Mean	. .	6 34	48.959	64.249	6 27	174.5					
	TITAN	300	6 48 55	56.543 .555	71.946 .932	6 43 6 46	145.0 145.7 145.1 145.1	. .	3 A	4	H.	Chron. corr., + 0m.1.
	Mean	. .	6 52	56.549	71.939	6 45	145.2					
	Ring Nebula in *Lyræ*	270	. .	57.96 58.01	70.29 .43	. .	. .	4.8 3.6 3.6	3	3	Hn.	Distance and angle of position of center from star A (brightest in field).
	Mean	. .	. .	57.99	70.36	. .	. .	4.0				
	Ring Nebula . . . A and B_2.	240	. .	. .	. .	. .	. .	209.6 211.2 211.8	3	3	Hn.	Angles of position of tangents from A to the bright exterior of ring. B_2 on south border. B_1 on north border.
	Mean	. .	. .	. .	. .	. .	. .	210.8				

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Oct. 25	Ring Nebula . . . A and B¹.	300	. .	. .	. .	. .	. .	152.4 153.8 155.8	3	3	Hn.	This tangent touches the *brightest* part of the ring and cuts the faint prolongation following the nebula.
	Mean	. .	. .	. .	. .	. .	. .	154.0				
	Satellite of NEPTUNE .	40	9 18 9 35	62.961 .959 63.034 62.987 .998 .949 .922 .971 .959 .973	. .	9 40 45 47	230.5 230.8 231.7 232.0 231.0	. .	5 A	4	Hn.	Setting for differences of Dec., 182°.2. Fixed wire A on planet; micrometer wire on satellite. Measures without clock-work. Chron. corr. for *Neptune* obs., + 1m.2.
	Mean	. .	9 27	62.971	. .	9 45	231.2					
	Merope Nebula . .	. .	. .	. .	. .	. .	. .	. .	155 neg	.	Hn.	Found it at once. *Merope* is a nebulous star, with a dark space on its *preceding north* and *following* sides. To the *south* it is joined by nebulosity to the main body of nebulosity above. This is not uniform in brightness, but cut up into portions by dark channels, several of them *north* and following *Merope*. The nebulosity extends north of this star some distance, some 6′ or 7′ at least, and perhaps more, as this point was not looked to. With 400, *Merope* is seen nebulous, but the rest is lost.—Hn.
	Merope Nebula . .	. .	. .	. .	. .	. .	. .	. .	. .	.	. .	*Comet Seeker;* power. I have drawn a dotted line on Temple's map (Pub. R. O. di Milano, No. 5, plate ii) where I see the boundary. I am sure it is further extended to the south and west than Temple has it. No nebulosity seen north of *Merope*.—Hn.
27	JAPETUS	280	6 52 7 5	57.018 .025 .070 .102	71.359 .408 .407 .420	6 44 6 49	. .	148.8 148.3 148.8 148.9	3 A	2	H.	Bad images.
	Mean	. .	6 58	57.054	71.399	6 46	. .	148.7				
	30 *Pegasi* . . . . B and A.	20	. .	. .	. .	. .	236.0 236.0 237.3 237.5	. .	3 A	2	H.	
	Mean	. .	. .	. .	. .	. .	236.7					
	30 *Pegasi* . . . . A and C.	230	. .	. .	. .	. .	215.7 216.4 216.5 216.4	. .	3 A	2	H.	It became too thick for distances.
	Mean	. .	. .	. .	. .	. .	216.2					
27	Satellite of NEPTUNE .	245	. .	. .	. .	. .	. .	. .	6 A	.	Hn.	Just seen, but much too unsteady for any measures.
28	JAPETUS	285	6 15 6 24	58.084 .114 .138	70.433 .430 .350	6 8 6 12	. .	148.0 147.7 147.7 147.5	3 A	3	H.	
	Mean	. .	6 20	58.112	70.404	6 10	. .	147.7				

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
1875.		°	h. m.	r.	r.	h. m.	°	°				
Oct. 28	HYPERION	260	6 40	50.735	64.250	6 29	. .	174.9	3 A	2	H.	*Hyperion excessively faint* on account of haze. Chron. corr., $+0^{m}.2$.
			47	.642	.246	6 35		173.5				
	Mean	. .	6 44	50.688	64.248	6 32		174.2				
29	TITAN	90	6 12	42.404	64.251	6 7	. .	164.2	3 A	4	H.	This distance probably four revolutions too great.
				.346	.253			164.3				
				.377	.251			164.3				
			6 16	.426	.250	6 10		164.1				
	Mean	. .	6 14	42.388	64.251	6 9	. .	164.2				
	HYPERION (?) . . .	270	6 49	46.620	. .	6 20	. .	166.3	3 A	3	H.	
				.725		30		166.5				
				.616		35		167.0				
			6 54	.622		6 37		167.0				
	Mean	. .	6 52	46.646	. .	6 31	. .	166.7				
	JAPETUS	25	7 4	61.653	66.721	6 58	217.1	. .	3 A	4	H.	
				.737	.753		217.1					
			7 10	.689	.774		217.6					
						7 1	217.4					
	Mean	. .	7 7	61.693	66.749	7 0	217.3					
	SATURN . . . . . (Diameter of ball.)	95	. .	62.421	66.066	. .	. .	. .	5 A	2	H.	Micrometer at 250°.
				.409	.040							
	Mean	. .	. .	62.415	66.053							
	(Diameter of dark ring)	95	. .	61.592	66.999	. .	. .	. .	5 A	2	H.	Micrometer at 250°; extremities not well defined. The above measures are of the major axis, but image not good with 600 A.—H.
				.531	.915							
	Mean	. .	. .	61.561	66.957							
	34 *Pegasi*	220	. .	63.980	64.508	. .	213.7	. .	5 A	2	H.	
	R. A. 22^{h} 20^{m}.			.980	.520		213.0					
	Dec. + 3° 48′.						216.7					
							214.8					
	Mean	. .	. .	63.980	64.514	. .	214.5					
	Satellite of NEPTUNE.	190	9 21	62.917	65.525	9 3	232.2	. .	6 A	3	Hn.	Chron. corr., $+0^{m}.2$.
				.928	.499		232.6					
					.483		233.5:					
			38	.986	.500		235.6:					
				63.002	.540		235.3					
			9 50	62.977	.563	9 15	235.2					
	Mean	. .	9 36	62.962	65.518	9 9	234.1					
	Double *	130	. .	63.655	64.881	. .	304.4	. .	I	3	Hn.	Object precedes *Electra* 41^{s} (of time), and is $30^{r}.6 = 305'' = 5' 5''$ south of it. Magnitudes 14 (nearly equal).
	R. A. 3^{h} 35^{m} 53^{s}.						303.6		I			
	Dec. + 23° 35′ 8″.						303.9		3			
	Mean	. .	. .	. .	. .	. .	304.0					
	Merope Nebula. . .	. .	. .	. .	. .	. .	. .	. .	I	.	Hn.	*Merope* looks nebulous to a distance of say 60″ following; then comes a dark streak, and then a narrow nebulous wisp (pos. 150 ± est.), which passes through a star 14^{m} 20^{s} following *Merope*. This 14^{m} star is the first star following *Merope* in the same declination (approximately). I see nothing of Wolf's 2d nucleus 7^{s} following *Merope*.—Hn.
	Nebula *Orionis* . . " Frons."	40	. .	. .	. .	. .	24.8	. .	I	.	Hn.	Parallel = 48°.3. Angles of position of prominent lines of brightest parts of the Huyghenian region.
							24.5					
							27.5					
							28.9					
							28.8					
	Mean	. .	. .	. .	. .	. .	26.9					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Oct. 29	Nebula *Orionis* . . " Occiput."	315	. .	. .	. .	. .	112.0 112.2 114.4 114.4 112.3	. .	1	.	Hn.	Parallel = 322°.1.
	Mean	. .	. .	. .	. .	. .	113.1					
	Nebula *Orionis* . .	10	. .	. .	. .	. .	67.5 65.9 69.2	. .	1	.	Hn.	Parallel = 7°.7. Edge of Huyghenian region.
	Mean	. .	. .	. .	. .	. .	67.5					
30	Satellite of NEPTUNE.	60	. .	. .	. .	. .	. .	. .	.	.	.	Just seen very well when interrupted by clouds and storm 9^{h} 30^{m}. Tried electric illumination for micrometer, and found it to work very well.—Hn.
31	Nebula of *Lyræ* . . (Minor axis).	150	. .	. .	. .	. .	276.8 279.1 279.2	. .	3	3	Hn.	Not easy to decide exactly the position of the minor axis, and readings somewhat uncertain.
	Mean	. .	. .	. .	. .	7	278.4					
	Nebula of *Lyræ* . . (Major axis).	60	. .	. .	. .	. .	10.4 12.0 13.0 12.5 12.7	. .	3	3	Hn.	North end of minor axis again seen with several bright points near it. Two bright patches seen also; one n. p. and one s. f.
	Mean	. .	. .	. .	. .	. .	12.1					
	Satellite of NEPTUNE.	40	10 4 10 30	62.392 .470 .516 .502 .482	65.865 .859 .833 .957 .945	9 49 9 57	215.0 216.0 213.8 215.0	. .	5 A	2	Hn.	Telescope west of pier, as all previous ones have been, unless otherwise noted. Very high wind and images unsteady.
	Mean	. .	10 17	62.472	65.892	9 53	215.0					
Nov. 2	Ring nebula in *Lyræ* (Major axis).	80	. .	64.26	73.31 10 33 24	. .	9.2 9.2 10.8 9.5	. .	1	3	H.	
	Mean	. .	. .	64.26	73.25	. .	9.7					
	Ring nebula in *Lyræ* (Minor axis).	160	. .	64.26	71.03 70.87 70.95 70.90	. .	279.7 278.4 279.8 279.6	. .	1	3	H.	Several small stars visible on the north and preceding sides of this nebula, and between it and the Schroeter stars.—H.
	Mean	. .	. .	64.26	70.94	. .	279.4					
	HYPERION	290	7 24 47 51 53	64.248 .242 .260 .245	80.105 79.885* .810 .897	7 16 7 21	145.0 145.1 144.4 144.8	. .	3 A	2	H.	Chron. corr., + $0^{m}.4$. * Clouds.
	Mean	. .	7 44	64.249	79.924	7 19	144.8					
	Satellite of NEPTUNE.	240	. .	. .	. .	. .	209.1???	. .	5 A and 6 A	.	Hn.	This is hardly more than a guess. No measures possible. Seeing very bad. Telescope west of pier.
5	Satellite of NEPTUNE.	70	9 25 9 43	63.454 .435	64.988 65.014	8 48 8 57	183.7 183.7 182.6 183.2	. .	6 A	2	Hn.	Satellite not visible with 600 A, and very faint indeed with 800 A. Telescope west of pier. Chron. corr. for NEPTUNE obs., 0^{m}.
	Mean	. .	9 34	63.445	65.001	8 53	183.3					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Nov. 6	Ring Nebula in *Lyræ* with following star.	270	. .	64.25	70.435 .428 .540	. .	349.6 349.5	. .	1	2	H.	*p* from star to nebula. Some haze and cloud; also moonlight; and nebula not bright. Parallel by Titan = 165°.2.
	Mean	. .	. .	64.25	70.468	. .	349.6					
	Satellite of NEPTUNE.	40	8 34 8 41	62.491 .570 .551 .524 .488	. .	8 17 20 28 29	215.2 215.5 213.9* 214.8 214.8	. .	6 A	2	Hn.	Single distances measured through clouds. * Not completed when stopped by clouds and excluded from mean.
	Mean	. .	8 37	62.525	. .	8 23	215.1					
			8 43 8 56 9 4	62.550 .536 .545	65.936 .941 .961	. .	. .	. .	6 A	3	Hn.	Chron. corr. for NEPTUNE obs, $-0^m.5$.
	Mean	. .	8 54	62.544	65.946							
	Star near NEPTUNE .	270	9 21	59.758* .679	. .	9 8	329.0 329.0	. .	6 A	.	Hn.	Brighter than satellite. * Single distances.
	Mean	. .	9 21	59.72		9 8	329.0					
	Star near NEPTUNE .	270	9 23	60.799* .744	. .	9 10	325.2 326.0	. .	6 A	.	Hn.	Telescope west of pier. No brighter than satellite; probably not so bright. * Single distances.
	Mean	. .	9 23	60.77	. .	9 10	325.6					
8	RHEA	95	7 11	57.086	71.420	7 5 7 9	. .	158.7 158.5 157.8 157.8	3 A	2	H.	Seeing became bad. Parallel = 169°.0 (not very sure). Chron. corr., $+0^m.6$.
	Mean	. .	7 12	57.086	71.420	7 8	. .	158.2				
	Satellite of NEPTUNE (?)	240	9 31		65.177	9 3 10 18 22	191.4 196.4 193.2* 196.4:: 195.8		6 A	1	Hn.	Telescope west of pier. Moonlight, and extremely bad seeing. These measures deserve very little weight, all conditions being unfavorable. * Good.
	Mean	. .	9 31		65.177	9 12	194.6					
	Satellite of NEPTUNE.	240	10 50 11 13	. .	65.214 .243 .192 .340 .316	. .	. .	. .	6 A	1	Hn.	Moonlight and satellite very faint and unsteady. Chron. corr., $-0^m.5$.
	Mean	. .	11 1	. .	65.261							
10	Satellite of NEPTUNE.	280??	. .	. .	. .	10 15 10 27	218.0:: 216.6: 216.7:	. .	9	.	Hn.	Estimated $s = 10''$. It is impossible to place a wire on the object measured, but the angles are good estimates only.
	Mean	. .	. .	. .	. .	. .	217.1					
11	HYPERION	90	7 24 26	42.115 .121	62.241 .247	7 13 7 20	161.5 161.4 161.2 161.7	. .	3 A	2	H.	Satellite very faint. Chron. corr., $+0^m.7$. The micrometer was moved in and out to tell the focus of wires.
	Mean	. .	7 26	42.118	62.244	7 17	161.4					
	Satellite of NEPTUNE.	50	. .	. .	. .	. .	. .	. .	.	.	Hn.	9^h. Seen with 800 A and 1100, and a few measures might have been made, but they could not have been depended upon. Nearly full moon.—Hn.

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Nov. 11	Nebula *Orionis* . .	45	. .	. .	. .	. .	22.0	. .	1	.	Hn.	Parallel 344°.15 ; good.
	“Frons.”						22.3					
							22.1					
							21.8.					
	Mean	. .	. .	. .	. .	. .	22.1					
	Nebula *Orionis* . .	315	. .	. .	. .	. .	114.0	. .	1	.	Hn.	
	“Occiput.”						114.2					
							115.9					
							115.5					
	Mean	. .	. .	. .	. .	. .	114.9					
	Nebula *Orionis* . .	100	. .	. .	. .	. .	328.2	. .	1	.	Hn.	* Good.
	South Shore. “Sinus						327.2*					
	Magnus.”						328.2					
							329.8					
	Mean		. .	. .	. .	. .	328.4					
	Nebula *Orionis* . .	90	. .	. .	. .	. .	345.0	. .	1	.	Hn.	
	North Shore. “Sinus						344.8					
	Magnus.”						343.4					
							344.7					
	Mean	. .	. .	. .	. .	. .	344.5					
	Nebula *Orionis* . .	180	. .	. .	. .	. .	84.6	. .	1	.	Hn.	
	“pons Schroeteri.”						82.3					
							83 7					
	Mean	. .	. .	. .	. .	. .	83.5					
12	HYPERION	95	6 50	64.245	85.565	6 41	161.2	. .	3 A	2	H.	Satellite very faint.
			53		.536		161.4					Chron. corr., + $0^{m}.7$.
						46	160.8					
	Mean	. .	6 52	64.245	85.550	6 44	161.1					
	Satellite of NEPTUNE.	34	10 42	62.469	65.949	10 33	214.9	. .	6 A	2	Hn.	Parallel for NEPTUNE, 160°.1.
				.457	.960		214.6					Chron. corr. for NEPTUNE, $0^{m}.0$.
				.450	[66].050		216.4					Moonlight strong.
			11 2	.500	[66].007	10 38	215.5					
	Mean	. .	10 52	62.469	65.992	10 36	215.4					
15	Satellite of NEPTUNE.	200	8 51	62.543*	65.943	8 33	216.9	. .	5 A	2	Hn.	* Probably .443 ; it is not included in the mean.—Hn.
				.428	.911		218.8		&			† Good.
				.413	.944	8 40			6 A			
				.400	66.067	8 40	213.8†					
				.445	.000		214.5					
				.427	65.952		215.6					
			9 22	.432		8 45	213.5†					
	Mean	. .	9 6	62.424	65.970	8 43	214.4					
	Satellite of NEPTUNE.	. .	. .	. .	. .	7 25	214.9	. .	. .	2	Hn.	Telescope west of pier. Hazy ; first two measures of position with 800 A are very uncertain on account of the fog round the planet ; subsequent measures with 600 A much better. Satellite pretty faint. Chron. corr., = 0^{m}.
							215.9					
							217.6					
						9 33	217.3					
	Mean	. .	. .	. .	. .	9 29	216.4					
17	RHEA	95	7 12	57.095	71.455	. .	. .	150.5	3 A	3	H.	Chron. corr., $0^{m}.0$.
			17	.025	.468	7 6		150.7				
								151.0				
						7 9		150.4				
	Mean	. .	7 15	57.060	71.461	7 8	.	150.6				

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Nov. 17	Satellite of NEPTUNE.	50	9 17	63.093	. .	8 48	194.8	. .	6 A	1	Hn.	Telescope west of pier. * Delayed by clock-work motion failing. † Good.
				.088			195.6					
				.135 :			193.3					
				*		9 8	191.4					
				.112			189.3					
				.159			191.2					
			9 42	.091†		9 11						
	Mean	. .	9 30	63.113	. .	9 02	192.6					
	HYPERION	278	6 40	64.240	83.185	6 31	150.5	. .	3 A	3	H.	Chron. corr., + $0^{m}.2$. Parallel = 161.3.
				.240	.266		150.3					
				.235	.282		150.4					
			6 45	.237	.150	6 36	150.5					
	Mean	. .	6 43	64.238	83.221	6 34	150.4					
22	Satellite of NEPTUNE.	160	9 14	. .	65.86*	8 56	257.2	. .	6 A	1	Hn.	This object is very faint, and it is doubtful whether it is the satellite or no. [This object was the satellite of NEPTUNE.] Measures not completed, but interrupted by clouds. * This must have been 64r. † Uncertain ; clouds.
					.82†	9 4	259.0					
	Mean	. .	. .	. .	64.84	9 0	258.1					
24	Satellite of NEPTUNE.	30	8 13	62.550	65.888	7 57	218.8	. .	6 A	3	Hn.	Telescope west of pier. Images diffuse. NEPTUNE's satellite seen quite well with a power of 175. Chron. corr., = $0^{m}.0$.
				.502	.912		220.6					
				.604	.930		216.9					
				.576	.947		217.8					
			8 35	.612	.957	8 6	218.7					
	Mean	. .	8 24	62.569	65.927	8 2	218.6					
25	HYPERION	310	6 37	64.235	73.534	6 28	123.0	. .	3 A	2	H.	Extremely faint. Chron. corr., + $0^{m}.3$.
			41	.233	.460		124.6					
						6 33	123.4					
	Mean	. .	6 39	64.234	73.497	6 31	123.7					
	Anonymous star . .	115	. .	64.035	64.462	7 0	123.9	. .	3 A	2	H.	This star is 8–9 mag.; companion is 13th.
	R. A. 21^{h} 32^{m} 8^{s}.			.005	.450		126.6					
	Dec. — 16° 1'.						128.4					
	Mean	. .	. .	64.020	64.456	. .	126.3					
	Satellite of NEPTUNE (?)	330	. .	. .	. .	10 45	289.	. .	6 A	.	Hn.	It is just possible this is the satellite very close to the planet. The seeing is not good enough to justify higher powers, which were tried without success.
	ζ Aquarii	. .	. .	63.842	64.671	. .	274.6	. .	3 A	1	H.	Estimated position angle, 165 and 180, (Angle (?) 180.) Diffuse images. Mag. 6 and 6. The night too bad for double stars.
				.836	.660		274.3					
							273.3					
							273.6					
	Mean	. .	. .	63.839	64.666	. .	273.9					
27	Satellite of NEPTUNE.	210	7 36	62.618	65.910	7 26	. .	217.0	5 A	2	H.	Unsteady images. Chron. corr., + $0^{m}.4$.
				.628	.823			214.8				
				.603	.896			217.0				
				.570	.869			216.6				
			7 47	.647	.820	7 33		217.4				
	Mean	. .	7 42	62.613	65.864	7 30	. .	216.6				
29	Satellite of NEPTUNE.	40	8 6	62.885	. .	7 51	195.4	. .	5 A	.	Hn.	Distances with 800 A. Setting for distances 282° should have been 288°.
				.972			199.0					
				.938			198.1					
				.903			197.3					
			8 15	.948								
						8 0						
	Mean	. .	8 10	62.929	. .	7 55	197.5					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Nov. 29	Satellite of NEPTUNE .	. .	. .	. .	64.225*	8 19	198.3	. .	6 A	.	Hn.	* Coincidence wires. † Good. Telescope west of pier. Chron. corr. for NEPTUNE observations, $-0^m.5$. Very windy and images very unsteady at first. Weight 1 for measures with 600 A; weight 2 for those with 800 A. During the whole of the measures from $7^h\ 51^m$ to $8^h\ 40^m$ I had an impression, which I could neither reject nor verify, that in the place of the satellite there were two bodies. I conceived that the first measure of position (195°.4) and the last of the first set (197.3) were made on the fainter and northernmost of these, and that the others were probably on the southernmost and brighter. The seeing was *very* bad until about $8^h\ 10^m$. During the distance measures I had the same impression, and supposed the first measure, and possibly the fourth, to refer to the nearer of the two. The last set of measures of position was taken to test this question, but the seeing was again worse. At $9^h\ 35^m$ the seeing was so bad that further examination was hopeless, and the doubt was left unsettled.—Hn.
					.248*		200.5					
					.227*		198.7					
					.247*	8 28	201.9†					
					.223*	8 33	201.8					
					.238*		204.0					
						8 37	201.5					
						8 40	200.1					
	Mean	. .	. .	. .	64.235	8 29	200.8					
30	Satellite of NEPTUNE.	25	8 6	62.593	65.870	7 54	220.5	. .	3 A	3	H.	Chron. corr., $+0^m.6$. A cold chilly night. To-night the astronomer had to contend with (1) a poor circuit in clock; (2) four gentlemen and ten ladies; (3) the driving clock had to be coaxed; (4) a northeast wind; and finally, he broke the two declination wires.
				.598	.925		219.1					
				.644	.880		219.2					
				.653	.865		218.2					
			8 16	.592	.920	7 59	218.4					
	Mean	. .	8 12	62.616	65.892	7 57	219.1					
Dec. 2	JAPETUS	93	5 38	64.234	82.152	5 28	297.0	. .	3 A	4	H.	Parallel = 301′.4 (Ver. I). Chron. corr., $-0^m.3$. The observations of this date made with the new wires put in by Mr. Gardner. They are a little finer than the old ones. He has put in also B, which has not been in for some time.—H.
					.261		296.8					
					.167		297.0					
			5 42		.264	5 32	296.9					
	Mean	. .	5 40	64.234	82.211	5 30	296.9					
	TITAN	100	5 52	48.267	64.234	5 45	289.6	. .	3 A	4	H.	
				.230	.229		289.5					
				.235	.234		289.6					
			5 57	.259	.238	5 50	289.7					
	Mean	. .	5 54	48.248	64.234	5 47	289.6					
	DIONE	100	6 9	59.484	68.980	6 4	289.4	. .	3 A	3	H.	Between the first and second measurements of DIONE (dist.) the clock stopped.
			22	.434	.910		289.9					
			28	.558	.967		289.4					
						6 6	289.4					
	Mean	. .	6 20	59.492	68.952	6 5	289.5					
	RHEA	250	6 37	59.662	68.861	6 30	. .	132.6	3 A	3	H.	
				.569	.892			132.6				
			6 44	.661	.917			132.7				
						6 34		132.1				
	Mean	. .	6 40	59.631	68.890	6 32	. .	132.5				
	B. A. C. 920*	65	. .	. .	. .	. .	325.2	. .	5 A	2	H.	* This cannot be 920 B. A. C. This comp. plainly seen by glimpses, but night not good enough for distances. This star discovered double by Burnham (?) † Sid. Time, 0^h.
	R. A. $21^h\ 1^m$.						328.3					
	Dec. + 21°.8.						327.6					
	Mean	. .	. .	. .	. .	. .	327.0†					
	ζ *Aquarii*	335	. .	63.870	64.570	. .	238.4	. .	5 A	3	H.	* Sid. Tme, $0^h.5$.
				.875	.592		239.6					
				.865	.610		240.8					
							239.4					
	Mean	. .	†	63.870	64.591	(*)	239.6					

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle.		Eye-piece.	Image.	Observer.	Remarks.
							Ver. I.	Ver. II.				
		°	h. m.	r.	r.	h. m.	°	°				
1875. Dec. 2	Satellite of NEPTUNE.	240	8 29	62.802	65.654	8 18	161.4	. .	5 A	3	H.	Satellite faint, but steady images.
				.772	.615		160.7					
				.799	.655		161.3					
				.766	.595		160.8					
			8 42	.760	.613	8 24	161.4					
	Mean	. .	8 35	62.780	65.626	8 21	161.1					
10	. . . .	. .	. .	. .	. .	. .	. .	. .	.	.	.	Micrometer removed to try double-image micrometers, etc. One of the wires knocked out by some one.—H.
15	Satellite of NEPTUNE.	200	6 48	62.774	65.639	6 36	215.7	. .	5 A	3	H.	Parallel = 152°.4 (Ver. II). Driving clock stopped, and then went too fast, but measures fair though satellite faint. Chron. corr., $+ 0^{m}.4$.
				.810	.600		215.8					
				.813	.571		214.5					
				.783	.628		215.2					
			7 4	.800	.578	6 43	214.6					
	Mean	. .	6 56	62.796	65.603	6 40	215.2					
17	Satellite of NEPTUNE.	35	. .	. .	. .	8 57	201.3	. .	5 A	3	H.	A clear cold night. Driving clock would not work. Images bad and unsteady, but NEPTUNE satellite pretty well seen. After some work started clock and made a few measures of NEPTUNE satellite, when the clock failed again.—H.
							200.5					
						9 2	201.5					
	Mean	. .	. .	. .	. .	9 0	201.1					
20	*ζ Aquarii*	340	. .	63.810	64.595	. .	. .	86.8	3 A	3	H.	
				.805	.593			87.6				
								88.2				
								88.1				
								91.6				
	Mean	Sid. Time, $0^{h}.5$		63.808	64.594			88.5				
	Satellite of NEPTUNE.	215	6 9	62.610	65.838	5 59	201.4					
				.626	.806		198.6					
				.580	.848		198.3					
				.550	.846		199.7					
			6 25	.640	.876	6 5	198.7					
	Mean	. .	6 17	62.601	65.843	6 2	199.3					
	γ^1 *Andromedæ* . . .	90	. .	63.152	65.209	. .	. .	359.6	5 A	3	H.	Chron. corr., $- 0^{m}.4$. γ^2 *Andromedæ* not separated, but oblong; images diffuse.
				.139	.276			0.4				
				.139	.246			0.0				
	Mean	Sid. Time, 2^{h}.		63.143	65.244	. .	. .	0.0				
22	*ζ Aquarii*	330	. .	63.794	64.594	. .	. .	269.4	6 A	2*	H.	* For *p*. † For *s*.
				.809	.580			270.7	.	3†		
				.801	.602			270.6				
				.853	.582			270.6				
	Mean	Sid. Time, 1^{h}.		63.814	64.589			270.3				
	Σ 19 . . . . . . R. A. 0^{h} $10^{m}.3$. Dec. + 35° 54′.	130	. .	64.015	64.457	. .	116.7	. .	3 A	3	H.	
				63.966	.482		115.2					
				.978	.467		113.5					
				.971	.473		118.0					
	Mean	Sid. Time, 1^{h}.		63.982	64.470	. .	115.9					
	Σ 23 . . . . . . R. A. 0^{h} $11^{m}.3$. Dec. − 0° 23′.	0	. .	63.365	65.104	. .	252.5	. .	3 A	3	H.	
				.345	.113		251.0					
				.317	.085		250.0					
				.328	.103		252.8					
	Mean	Sid. Time, 1^{h}.		63.339	65.101	. .	251.6					
	Satellite of NEPTUNE.	. .	. . .	. . .	. .	. .	. .	. .	.	.	.	The satellite visible by glimpses only and too difficult for measures. Tried several double stars, but seeing became poor; *ε Arietis* not separated, and images too bad for observing.—H.

Date.	Object observed.	Estimated position angle.	Washington Mean Time.	Microm. I (smallest reading).	Microm. II (largest reading).	Washington Mean Time.	Position Circle. Ver. I.	Position Circle. Ver. II.	Eye-piece.	Image.	Observer.	Remarks.
		°	h. m.	r.	r.	h. m.	°	°				
1875. Dec. 23	Σ 23	0	. .	63.361 .310 .344 .338	65.100 .045 .050 .092	. .	69.3 69.5 70.4 69.9	. .	3 A	2	H.	Parallel = 332°.4 (Ver II). Too much haze for sat. of NEPTUNE. γ^2 *Andromedæ* seen wedge-shaped, but images became too bad for measures. In observation of γ^1 *Andromedæ*, the stars were varying in brightness, being seen through drifts of haze, but images partly steady.—H.
	Mean	Sid. Time, $0^h.5$		63.338	65.072	. .	69.8					
	Σ 19	130	. .	63.943 .920 .932 .950	64.469 .467 .490 .470	. .	119.0 113.2 114.0 113.0	. .	3 A	2	H.	
	Mean	Sid. Time, $0^h.5$		63.936	64.474	. .	114.8	. .				
	65 *Piscium*. . . . R. A. 0^h 43^m. Dec. + 27° 0′.	120	. .	63.769 .727 .730 .733	64.683 .677 .679 .671	. .	130.5 130.3 130.1 130.5		3 A	3	H.	Driving-clock stopped half an hour.
	Mean	Sid. Time, 1^h		63.740	64.678	. .	130.4					
	36 *Andromedæ*. . . R. A. 0^h $48^m.3$. Dec. + 22° 57′.	350	. .	64.070 .078 .080	64.378 .346 .343	. .	59.7 58.5 60.2 59.0	. . .	. .	.	.	For 36 *Andromedæ* quite hazy.
	Mean	Sid. Time, 1^h		64.076	64.356	. .	59.3					
	γ^1 *Andromedæ* . . . R. A. 1^h 55^m. Dec. + 41° 36′.	65	. .	63.129 .161 .146 .138	65.285 .275 .267 .222	. .	359.1 0.3 358.9 0.2	. .	3 A	3	H.	
	Mean	. .	. .	63.144	65.262		359.6					
27	65 *Piscium* . . .	115	. .	63.737 .751 .732 .748	64.627 .649 .661 .651	. .	129.1 128.0 129.2 129.0	. .	3 A	3	H.	Stars are decidedly orange color.
	Mean	Sid. Time, 1^h		63.742	64.647	. .	128.8					
	36 *Andromedæ*. . .	0	. .	64.118 .072 .052 .060	64.358 .321 .326 .318	. .	61.3 61.8 61.7 60.2	. .	3 A	2	H.	
	Mean	Sid. Time, $1^h.5$		64.076	64.331	. .	62.0					
	Σ 138 . . . . . . R. A. 1^h 30^m. Dec. + 7° 0′.	20	. .	64.046 .050 .042 .056	64.357 .345 .353 .355	. .	27.2 28.0 29.4 28.6	. .	3 A	3	H.	
	Mean	Sid. Time, 2^h		64.049	64.352	. .	28.3					
	Σ 138*	50	. .	61.862 .928	66.459 .382	. .	358.8 0.2 0.8 0.8	. .	3 A	2	H.	* A faint comp. of Σ 138, 14th mag.
	Mean	. .	. .	61.895	66.420		0.1					
	107 *Arietis*. . . . R. A. 2^h $36^m.7$. Dec. + 25° 5′.	20	. .	63.884 .873	64.500 .485	. .	46.4 47.1 46.6 46.6	. .	3 A	2	H.	Driving-clock behaving badly.
	Mean	. .	. .	63.878	64.492		46.7					
	W. III, 564 . . .	330	. .	. .	. .	. .	. .	. .	3 A	.	H.	Looked at this star, which is an easy double, but images too bad for measurements.

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.*		Transit of Satellite.		Δa		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
June 10	JAPETUS . . .	. .	†20 11 24.80	28.85	20 11 59.85	3.75	+35.05	+34.90	. .	.	. .	*The numbers here entered for the centre are the means of observations on the two limbs, which are omitted to save space. † Sidereal time.
			12 30.07	35.17	13 5.20	10.10	35.13	34.93				
			13 54.25	59.22	14 29.40	34.30	35.15	35.08				
			15 56.25	1.22	16 31.30	36.30	35.05	35.08				
			16 58.30	3.28	17 33.40	38.35	35.10	35.07				
			17 54.00	58.95	18 29.00	34.00	35.00	35.05				
			18 59.15	4.15	19 34.35	39.25	35.20	35.10				
			19 55.88	0.85	20 31.00	35.80	35.12	34.95				
			20 54.08	58.95	21 29.15	34.00	35.07	35.05				
			20 22 8.85	13.90	20 22 43.85	49.00	+35.00	+35.10				
	Mean	. .	. . .	. .	. . .	. .	+35.087	+35.081				
				$67^r.996$	$66^r.738$	. .	. .	. .	5 A	3	H.	JAPETUS north, following SATURN.
			h. m.	.893	.762							
			20 39	.910	.790							
				.982	.761							
				.988	.786							
	Mean	. .	. .	67.954	66.773							
12	. . . .	. .	. .	$68^r.573$	$67^r.408$	. .	. .	. .	5 A	2	. .	JAPETUS north, following SATURN. Windy and images bad.
			h. m.	.433	.277							
			20 10	.677	.440							
				.648	.650							
				.695	.555							
	Mean	. .	. .	68.605	67.426							
	JAPETUS . . .	. .	20 19 8.60	12.75	20 19 44.40	48.50	+35.80	+35.75	. .	.	H.	
			20 20.35	24.50	20 56.00	60.30	35.65	35.80				
			22 6.60	10.65	22 42.25	46.30	35.65	35.65				
			23 2.60	6.75	23 38.40	42.40	35.80	35.65				
			25 19.92	24.05	25 55.65	59.75	35.73	35.70				
			26 20.90	25.18	26 56.80	1.00	35.90	35.82				
			27 38.55	42.70	28 14.35	18.40	35.80	35.70				
			29 27.90	32.05	30 3.60	7.60	35.70	35.55				
			30 38.90	42.92	31 14.60	18.70	35.70	35.78				
			31 53.35	57.40	32 29.00	33.00	35.65	35.60				
			33 56.15	0.38	34 31.90	36.00	35.75	35.62				
			20 34 54.20	58.35	20 35 29.95	34.00	+35.75	+35.65				
	Mean	. .	. . .	. .	. . .	. .	+35.740	+35.689				
13	JAPETUS . . .	. .	20 7 33.95	38.15	20 8 9.60	14.00	+35.65	+35.85	5 A	2	H.	Stopped by clouds and could get no $\Delta\delta$.
			8 39.40	43.70	9 15.20	19.40	35.80	35.70				
			9 52.30	56.55	10 28.00	32.25	35.70	35.70				
			10 52.85	56.98	11 28.80	32.80	35.95	35.82				
			20 11 59.52	3.68	20 12 34.95	39.30	+35.43	+35.62				
	Mean	. .	. . .	. .	. . .	. .	+35.706	+35.718				
14	*ν Scorpii* . . . R. A. 16h 51m. Dec. — 19°.	10?	. . .	. .	. . .	. .	. .	. .	3	.	Hn.	Magnitude 4. The principal star is plainly elongated, but the image is much too poor for measures.
	JAPETUS . . .	. .	19 23 57.72	1.82	20 24 33.30	37.30	+35.58	+35.48	5 A		.	
			25 12.48	16.52	25 47.80	51.90	35.32	35.38				
			26 28.47	32.58	27 3.80	7.85	35.33	35.27				
			27 53.10	59.05	28 28.50	32.50	35.40	35.45				
			28 50.62	54.65	29 25.90	29.95	35.28	35.30				
			29 52.18	56.23	30 27.60	31.60	35.42	35.37				
			30 56.40	0.45	31 31.80	35.90	35.40	35.45				
			33 18.95	23.00	33 54.40	58.30	35.45	35.30				
			34		34							
			36 10.90	14.87	36 46.30	50.30	35.40	35.43				
			37 40.72	44.80	38 16.10	20.15	35.28	35.33				
			39 7.35	11.88	39 42.90	46.90	35.55	35.52				
			40 10.12	14.10	40 45.60	49.50	35.48	35.40				
			19 41 16.90	20.90	20 41 52.35	56.30	+35.45	+35.40				
	Mean	. .	. . .	. .	. . .	. . .	+35.411	+35.392				

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δα		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m.									
June 14	JAPETUS . . .	. .	19 46.8	68^{r}.200	67^{r}.052	. .	. .	. .	5 A	3	H.	JAPETUS north, following SATURN.
			48.8	.436	.262							
			50.6	.530	.345							
			52.2	.561	.403							
			54.0	.667	.462							
			55.9	.696	.496							
	Mean	. .	19 51.4	68.515	67.337							
16	Diff. of R. A. . . Sat. and JUPITER.	. .	. . .	. .	. . .	. .	. .	. .	3	.	Hn.	Diameter of JUPITER, 2^{s}.690 (20 transits). Difference of R. A. between Satellite and JUPITER, 0^{s}.603 (20 transits over 3 wires).
			h. m. s.	s.	h. m. s.	s.	s.	s.				
	JAPETUS . . .	. .	19 17 38.10	42.68	19 18 12.30	16.90	+34.20	+34.22	5 A	3	H.	JAPETUS north, following SATURN. Begun at 9^{h} 13^{m} (sidereal time).
			19 0.78	5.45	19 34.90	39.60	34.12	34.15				
			20 16.67	21.35	20 50.90	55.55	34.23	34.20				
			21 25.90	30.55	22 0.15	4.75	34.25	34.20				
			22 23.00	27.65	22 57.25	1.80	34.25	34.15				
			23 35.35	39.95	24 9.50	14.20	34.15	34.25				
			24 58.75	3.32	25 33.00	37.55	34.25	34.23				
			27 20.08	24.75	27 54.30	59.00	34.22	34.25				
			28 39.27	43.98	29 13.60	18.15	34.33	34.17				
			29 55.80	0.50	30 30.00	34.70	34.20	34.20				
			31 15.70	20.30	31 50.00	54.50	34.30	34.20				
			32 56.20	0.87	33 30.40	35.00	34.20	34.13				
			34 13.87	18.55	34 48.15	52.75	+34.28	+34.20				
	Mean	. .	. . .	. .	. . .	. .	+34.230	+34.196				
				68^{r}.497	67^{r}.334							
			h. m.	.587	.491							
			19 46	.820	.648							
				.824	.730							
				.766	.670							
	Mean	. .	. .	68.699	67.575							
			h. m.			h. m.		°				
	ENCELADUS . .	85	14 32	61^{r}.552	66^{r}.975	14 24	. .	12.0	5 A	3	H.	Chron. corr., = — 3^{m}.5.
				.533	.942			12.1				
				.492	67.027			10.9				
			14 43	.450	66.942			12.2				
						14 28		13.3				
	Mean	. .	14 34	61.507	66.972	14 22	. .	12.1				
			h. m.			h. m.		°				
	HYPERION? . .	100	14 59	64^{r}.267*	85^{r}.732†	14 49	. .	358.2	5 A	3	H.	Chron. corr., = — 3^{m}.5. *Coincidence. †Single dist.
			15 5	.287*	.620†			357.7				
			9	.289*	.676†			357.1				
			11	.295*	.750†	14 54		357.5				
	Mean	. .	15 2	64.284	85.694	14 48	. .	357.6				
20	JAPETUS . . .	. .	19 15 18.70	22.87	19 15 48.20	52.20	+29.50	+29.33	5 A	3	H.	JAPETUS north, following SATURN. Begun at 19^{h} 8^{m} (sidereal time).
			16 16.85	21.05	16 46.25	50.35	29.40	29.30				
			17 15.92	20.15	17 45.20	49.60	29.28	29.45				
			18 27.95	32.15	18 57.40	1.50	29.45	29.35				
			19 18.35	22.65	19 47.75	52.00	29.40	29.35				
			20 27.50	31.67	20 56.80	1.00	29.30	29.33				
			21 24.80	29.00	21 54.10	58.40	29.30	29.40				
			22 35.20	39.28	23 4.50	8.65	29.30	29.37				
			25 41.60	45.80	26 10.95	15.15	29.35	29.35				
			26 45.58	49.70	27 14.85	19.00	29.27	29.30				
			28 9.10	13.35	28 38.40	42.55	29.30	29.20				
			29 23.88	28.00	29 53.10	57.45	29.22	29.45				
			30 32.17	36.32	31 1.65	5.75	29.48	29.43				
			31 54.48	58.70	32 23.80	28.00	+29.32	+29.30				
	Mean	. .					+29.348	+29.351				
		. .		67^{r}.497	66^{r}.501							
			h. m.	.603	.748							
			19 40	.687	.818							
				.731	.840							
				.756	.888							
	Mean	. .	. .	67.655	66.759							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δ α		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
1875. June 24	JAPETUS . . .	. .	19 52 24.15	27.85	19 52 45.50	49.35	+21.35	+21.50	5 A	3	H.	JAPETUS north, following SATURN. Begun at 19^{h} 47^{m} (sidereal time).
			53 10.70	14.55	53 31.95	35.80	21.25	21.25				
			54 11.86	15.70	54 33.30	37.00	21.44	21.30				
			54 59.70	3.50	55 21.00	24.80	21.30	21.30				
			55 56.25	0.00	56 17.60	21.35	21.35	21.35				
			59 28.10	31.95	59 49.40	53.25	21.30	21.35				
			20 0 36.95	40.82	20 0 58.30	2.10	21.35	21.28				
			1 31.55	40.83	1 58.35	2.10	21.37	21.27				
			2 31.55	35.35	2 52.90	56.60	21.35	21.25				
			3 20.25	24.00	3 41.50	45.30	21.25	21.30				
			4 16.08	19.87	4 37.40	41.25	21.32	21.28				
			5 2.38	6.15	5 23.75	27.40	21.37	21.25				
			6 39.05	42.85	7 0.40	4.25	+21.35	+21.40				
	Mean	. .	. . .	. .	. . .	. .	+21.342	+21.314				
				63^{r}.012	62^{r}.475							
			h. m.	.150	.570							
			20 20	.210	.608							
				.190	.670							
				.300	.726							
	Mean	. .	. .	63.172	62.610							
	TITAN. . . .	. .	19 52 24.15	27.85	19 52 36.90	40.60	+12.75	+12.75	5 A	3	H.	TITAN south, following SATURN.
			53 10.70	14.55	53 23.45	27.20	12.75	12.65				
			54 11.86	15.70	54 24.60	28.35	12.74	12.65				
			54 59.70	3.50	55 12.40	16.20	12.70	12.70				
			55 56.25	0.00	56 9.00	12.75	12.75	12.75				
			59 28.10	31.90	59 40.85	44.60	12.75	12.70				
			20 0 36.95	40.82	20 0 49.70	53.55	12.75	12.73				
			1 36.98	40.83	1 49.80	53.50	12.82	12.67				
			2 31.55	35.35	2 44.30	48.10	12.75	12.75				
			3 20.25	24.00	3 32.95	36.70	12.70	12.70				
			4 16.08	19.88	4 28.80	32.60	12.72	12.72				
			5 2.38	6.15	5 15.00	18.85	12.72	12.70				
			6 39.05	42.85	6 51.70	55.55	+12.65	+12.70				
	Mean	. .	. . .	. .	. . .	. .	+12.735	+12.701				
				66^{r}.080	67^{r}.570							
			h. m.	.145	.679							
			20 32	.114	.640							
				.154	.690							
				.211	.747							
	Mean	. .	. .	66.141	67.665							
	HYPERION . .	. .	20 10 45.00	48.80	20 10 31.25	35.15	−13.75	−13.65	5 A	3	H.	HYPERION north, preceding SATURN. End at 20^{h} 42^{m} (sid. time),
			11 47.65	51.45	11 33.95	37.65	13.70	13.80				
			12 30.85	34.65	12 17.00	21.00	13.85	13.65				
			13 8.38	12.23	12 54.60	58.30	13.78	13.93				
			14 57.50	1.38	14 43.85	47.50	−13.65	−13.88				
	Mean	. .	. . .	. .	. . .	. .	−13.746	−13.782				
			h. m.	64^{r}.838	66^{r}.150							
			20 38.5	.780	.222							
				.793	.185							
	Mean	. .	. .	64.804	66.186							
26	JAPETUS . . .	. .	20 1 50.00	53.18	20 2 6.55	9.80	+16.55	+16.62	5 A	3	H.	JAPETUS north, following SATURN. Begun at 19^{h} 53^{m} (sid. time). Ended at 20^{h} 23^{m} (sid. time).
			2 45.33	48.62	3 1.90	5.05	16.57	16.43				
			3 45.37	48.58	4 1.90	5.10	16.53	16.52				
			4 50.57	53.07	5 7.00	10.20	16.43	16.53				
			5 46.83	50.00	6 3.30	6.40	16.47	16.40				
			6 57.78	1.00	7 14.30	17.45	16.52	16.45				
			7 49.70	53.00	8 6.15	9.35	16.45	16.35				
			9 10.90	14.10	9 27.37	30.60	16.47	16.50				
			10 2.23	5.35	10 18.65	21.85	16.42	16.50				
			15 27.03	30.30	15 43.45	46.75	16.42	16.45				
			16 16.95	20.12	16 33.40	36.65	16.45	16.53				
			17 21.18	24.35	17 37.60	40.75	16.42	16.40				
			18 15.60	18.78	18 32.00	35.30	16.40	16.52				
			19 48.67	51.85	20 5.15	8.30	16.48	16.45				
			21 52.20	55.35	22 8.60	11.80	+16.40	+16.45				
	Mean	. .	. . .	. .	. . .	. .	+16.465	+16.470				

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δ *a*		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°										
June 24	Japetus . . .	. .	. .	$65^{\mathrm{r}}.655$	$65^{\mathrm{r}}.308$							
			h. m.	.607	.286							
			14 17	.580	.288							
				.740	.394							
				.772	.448							
	Mean	. .	. .	65.671	65.345							
			h. m. s.	s.	h. m. s.	s.	s.	s.				
26	Titan . . .	. .	20 1 50.00	53.18	20 2 0.40	3.50	+10.40	+10.32	5 A	3	H.	Titan south, following Saturn.
			2 45.32	48.62	2 55.85	59.20	10.52	10.58				
			3 45.38	48.58	3 55.75	59.10	10.38	10.52				
			4 50.58	53.68	5 0.95	4.30	10.38	10.63				
			5 46.82	50.00	5 57.30	0.40	10.47	10.40				
			6 57.78	1.00	7 8.25	11.45	10.47	10.45				
			7 49.70	53.00	8 0.20	3.40	10.50	10.40				
			9 10.90	14.10	9 21.40	24.60	10.50	10.50				
			10 2.22	5.35	10 12.65	15.80	10.42	10.45				
			15	30.30	15 37.55	40.70	10.52	10.40				
			16 16.95	20.12	16 27.40	30.60	10.45	10.48				
			17 21.18	24.35	17 31.60	34.80	10.42	10.45				
			18 15.60	18.78	18 25.95	29.30	10.35	10.52				
			19 48.68	51.85	19 59.15	2.30	10.48	10.45				
			21 52.20	55.35	22 2.70	5.90	+10.50	+10.55				
	Mean	. .	. . .	. .	. . .	. .	+10.451	+10.473				
				$65^{\mathrm{r}}.802$	$69^{\mathrm{r}}.613$							
			h. m.	.733	.550							
			14 25	.825	.672							
				.820	.637							
				.872	.704							
	Mean	. .	. .	65.810	69.635							
	Hyperion . .	. .	20 9 10.90	14.10	20 8 58.20	1.50	−12.70	−12.60	5 A	3	H.	Hyperion north, preceding Saturn.
			10 2.23	5.35	9 49.50	52.80	12.73	12.55				
			15 27.03	30.30	5 14.35	17.60	12.68	12.70				
			16 16.95	20.12	16 4.20	7.40	12.75	12.72				
			17 21.18	24.35	17 8.40	11.55	12.78	12.80				
			18 15.60	18.78	18 2.80	6.20	12.80	12.58				
			19 48.67	51.85	19 35.90	39.25	12.77	12.60				
			21 52.20	55.35	21 39.55	42.45	−12.65	−12.90				
	Mean	. .	. . .	. .	. . .	. .	−12.732	−12.681				
				$61^{\mathrm{r}}.945$	$65^{\mathrm{r}}.858$							
			h. m.	.903	.886							
			14 33	.865	.874							
				.992	.908							
				.998	.980							
	Mean	. .	. .	61.941	65.901							
July 12	Japetus . . .	. .	21 0 42.10	46.05	20 0 15.40	19.40	−26.70	−26.65	5 A	3	H.	Japetus south, preceding Saturn. Begun 20^{h} 55^{m} (sid. time). (20^{h} 18^{m})?
			1 42.69	46.65	1 16.00	19.90	26.69	26.75				
			2 54.52	58.60	2 27.90	31.85	26.62	26.75				
			3 57.95	1.85	3 31.20	35.25	26.75	26.60				
			5 2.35	6.38	4 35.80	39.70	26.55	26.68				
			7 30.55	34.37	7 3.78	7.70	26.77	26.67				
			9 2.80	6.83	8 36.20	40.00	26.60	26.60				
			10 17.30	21.30	9 50.60	54.60	26.70	26.70				
			11 27.10	31.05	11 0.40	4.40	26.70	26.65				
			12 40.95	44.92	12 14.30	18.30	26.65	26.62				
			15 42.00	46.03	15 15.40	19.30	−26.60	−26.73				
	Mean	. .	. . .	. .	. . .	. .	−26.666	−26.673				
				$64^{\mathrm{r}}.622$	$65^{\mathrm{r}}.685$	. .	. .	. .				
			h. m.	.555	.560							
			14 10	.522	.626							
				.506	.593							
				.573	.634							
	Mean	. .	. .	64.556	65.620							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δα		Eye-piece.	Image.	Observer.	Remarks.
			.Wire. I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
July 12	TITAN . . .	. .	21 0 42.10	46.05	21 0 52.60	56.50	+10.50	+10.45	5 A	3	H.	TITAN south, following SATURN.
			1 42.69	46.65	1 53.15	57.20	10.46	10.55				
			2 54.52	58.60	3 5.00	9.00	10.48	10.40				
			3 57.95	1.85	4 8.30	12.30	10.35	10.45				
			5 2.35	6.38	5 12.90	16.90	10.55	10.52				
			7 30.55	34.37	7 40.95	44.87	10.40	10.52				
			9 2.80	6.83	9 13.23	17.20	10.43	10.37				
			10 17.30	21.30	10 27.67	31.75	10.37	10.45				
			11 27.10	31.05	11 37.60	41.50	10.50	10.45				
			12 40.95	44.92	12 51.40	55.30	10.45	10.38				
			15 42.00	46.03	15 52.50	56.45	+10.50	+10.42				
	Mean	. .	. . .	. .	. . .	. .	+10.454	+10.449				
				64^r.608	68^r.658							
			h. m.	.582	.650							
			14 20	.703	.697							
				.611	.647							
				.644	.661							
	Mean	. .	. .	64.630	68.663							
14	JAPETUS . . .	. .	21 19 8.55	12.10	21 18 38.00	41.47	−30.55	−30.53	5 A	3	H.	JAPETUS south, preceding SATURN. JAPETUS brighter on the preceding side of SATURN. Begun at 21^h 12^m (sid. time). Ended at 21^h 44^m (sid. time).
			20 5.65	9.13	19 35.00	38.50	30.65	30.63				
			21 1.68	5.17	20 31.00	34.50	30.68	30.67				
			21 56.95	0.38	21 26.30	29.75	30.65	30.63				
			23 30.75	34.23	23 0.20	3.60	30.55	30.63				
			24 20.35	23.90	23 49.75	53.32	30.60	30.58				
			25 12.70	16.20	24 42.00	45.60	30.70	30.60				
			26 6.48	9.97	25 35.90	39.35	30.58	30.62				
			27 0.43	3.92	26 29.80	33.35	30.63	30.57				
			27 50.35	53.84	27 19.70	23.20	30.65	30.64				
			31 11.30	14.75	30 40.70	44.25	30.60	30.50				
			32 0.38	3.98	31 29.80	33.30	30.58	30.68				
			32 54.37	57.93	32 23.70	27.25	30.67	30.68				
			33 53.12	56.63	33 22.40	25.90	−30.72	−30.73				
	Mean	. .	. . .	. .	. . .	. .	−30.629	−30.624				
				59^r.610	60^r.765							
			h. m.	.630	.740							
			14 25	.575	.718							
				.564	.715							
				.574	.699							
	Mean		. .	59.591	60.727							
	HYPERION . .	. .	21 37 59.30	2.85	21 37 47.60	50.90	−11.70	−11.95	5 A	2	H.	HYPERION? south, preceding SATURN, very faint; haze put a stop to further measures.
			38 37.66	41.20	38 25.65	29.30	12.01	11.90				
			39 13.82	17.35	39 1.90	5.45	11.92	11.90				
			39 54.83	58.33	39 43.00	46.25	11.83	12.08				
			40 34.30	37.85	40 22.45	25.95	11.85	11.90				
			41 17.35	20.92	41 5.60	9.00	11.75	11.92				
			42 0.58	4.03	41 48.60	52.27	−11.98	−11.76				
	Mean	. .	. . .	. .	. . .	. .	−11.873	−11.916				
			h. m.									
			14 38	59^r.483	60^r.020							
			14 40	.482	59.930							
			. .	59.482	59.975							
16	JAPETUS . . .	. .	19 58 51.50	55.30	19 58 17.75	21.50	−33.75	−33.80	5 A	2	H.	JAPETUS south, preceding SATURN.
			20 0 7.12	10.91	59 33.20	37.20	33.92	33.71				
			1 8.14	11.99	20 0 34.40	38.20	33.74	33.79				
			2 24.91	28.72	1 51.20	54.95	33.71	33.71				
			4 29.45	33.28	3 55.60	59.50	33.85	33.78				
			5 57.28	1.15	5 23.55	27.40	33.73	33.75				
			7 19.17	22.99	6 45.40	49.30	33.77	33.69				
			8 46.26	50.10	8 12.50	16.30	33.76	33.80				
			10 9.25	13.03	9 35.40	39.20	33.85	33.83				
			11 21.37	25.20	10 47.63	51.43	33.74	33.77				
			12 33.95	37.70	12 0.00	3.93	33.95	33.77				
			13 41.08	44.75	13 7.30	11.00	33.78	33.75				
			14 50.43	54.28	14 16.57	20.50	−33.86	−33.78				
	Mean	. .	. . .	. .	. . .	. .	−33.801	−33.768				

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δ α		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875. July 16				$66^{r}.474$	$67^{r}.650$							
			h. m.	.512	.688							
			13 1	.528	.708							
				.605	.817							
				.614	.778							
	Mean	. .	. .	66.547	67.728							
		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
24	JAPETUS . . . R. A. $20^{h}\ 0^{m}$.	. .	20 3 38.25	41.62	20 3 0.30	3.68	−37.95	−37.94	5 A	2	H.	JAPETUS south, preceding SATURN.
			5 3.82	7.16	4 25.83	29.30	37.99	37.86				
			6 37.70	41.05	5 59.63	3.00	38.07	38.05				
			8 4.97	8.26	7 26.90	30.28	38.07	37.79				
			9 15.17	18.62	8 37.25	40.50	37.92	37.87				
			10 55.92	59.33	10 17.90	21.33	38.02	38.00				
			14 9.94	13.32	13 31.90	35.35	38.04	37.97				
			15 37.12	40.50	14 59.20	2.40	37.92	38.10				
			17 26.80	30.20	16 48.76	52.20	38.04	38.00				
			21 16.37	19.72	20 38.38	41.80	37.99	37.92				
			22 42.88	46.15	22 4.83	8.25	38.05	37.90				
			23 57.48	0.96	23 19.40	22.98	38.08	37.98				
			25 9.83	13.25	24 31.92	35.30	37.91	37.95				
			27 15.08	18.48	26 37.15	40.53	−37.93	−37.95				
	Mean	. .	. . .	. .	. . .	. .	−37.999	−37.977				
				$66^{r}.508$	$67^{r}.174$							
			h. m.	.489	.333							
			13 1	.522	.285							
				.540	.294							
				.510	.190							
	Mean	. .	. .	66.514	67.255							
26	JAPETUS . . .	. .	20 25 4.00	8.30	20 24 27.30	31.40	−36.70	−36.90	.	.	H.	JAPETUS south, preceding SATURN. Sidereal clock 44^{s} slow.
			26 7.08	11.45	25 30.40	34.60	36.68	36.85				
			27 28.80	33.10	26 52.10	56.30	36.70	36.80				
			28 57.95	2.25	28 21.20	25.40	36.75	36.85				
			30 18.23	22.57	29 41.45	45.80	36.85	36.78				
			31 49.61	53.84	31 12.88	17.20	36.73	36.64				
			33 10.02	14.26	32 33.20	37.50	36.82	36.76				
			35 40.27	45.05	35 3.60	8.25	36.67	36.80				
			37 8.73	13.51	36 31.95	36.73	36.78	36.78				
			39 4.05	9.73	38 27.30	31.96	36.75	36.77				
			40 39.73	44.46	40 2.97	7.77	36.76	36.69				
			42 14.16	18.83	41 37.33	41.97	36.83	36.86				
			44 0.69	5.35	43 24.00	28.65	36.69	36.70				
			45 44.65	49.35	45 7.90	12.60	−36.75	36.75				
	Mean	. .	. . .	. .	. . .	. .	−36.747	−36.781				
			h. m.	$67^{r}.726$	$68^{r}.350$							
			12 43	.759	.341							
				.861	.397							
				.808	.477							
				.823	.479							
	Mean	. .	. .	67.795	68.409							
	TITAN	. .	20 27 28.80	33.10	20 27 42.20	46.35	+13.40	+13.25	5 A	3	H.	TITAN south, following SATURN.
			28 57.95	2.25	29 11.18	15.47	13.23	13.22				
			30 18.23	22.57	30 31.50	35.77	13.27	13.19				
			31 49.61	53.84	32 2.90	7.27	13.29	13.43				
			33 10.02	14.26	33 23.28	27.50	13.26	13.24				
			35 40.27	45.05	35 53.65	58.25	13.38	13.20				
			37 8.73	13.51	37 21.97	26.80	13.24	13.29				
			39 4.05	9.73	39 17.30	21.98	13.25	13.25				
			40 39.73	44.46	40 53.00	57.75	13.27	13.29				
			42 14.16	18.83	42 27.40	32.10	13.24	13.27				
			44 0.69	5.35	44 14.00	18.73	13.31	13.38				
			45 44.65	49.35	45 57.97	2.60	+13.32	+13.25				
	Mean	. .	. . . .	. .	. .	. .	+13.288	+13.272				
				$67^{r}.811$	$69^{r}.609$							
			h. m.	.850	.544							
			12 51	.898	.621							
				.936	.643							
				.926	.715							
	Mean	. .	. .	67.884	69.626							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δ a		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
July 26	HYPERION . .	. .	20 27 28.80	33.10	20 27 44.92	49.15	+16.12	+16.05	5 A	3	H.	HYPERION south, following SATURN.
			28 57.95	2.25	29 13.97	18.20	16.02	15.95				
			30 18.23	22.57	30 34.25	38.50	16.02	15.92				
			31 49.61	53.84	32 5.62	10.00	16.01	16.16				
			33 10.02	14.26	33 26.00	30.23	15.98	15.97				
			35 40.27	45.05	35 56.38	0.93	16.11	15.88				
			37 8.73	13.51	37 24.75	29.53	16.02	16.02				
			39 4.05	9.73	39 20.00	24.93	15.95	16.20				
			40 39.73	44.46	40 55.90	0.40	16.17	15.94				
			42 14.16	18.83	42 30.28	34.75	16.12	15.92				
			44 0.69	5.35	44 16.85	21.56	16.16	16.21				
			45 44.65	49.35	46 0.83	5.60	+16.18	+16.25				
	Mean	. .	. . .	. .	. . .	. .	+16.072	+16.039				
				68^{r}.031	68^{r}.266							
			h. m.	.056	.271							
			12 58	.020	.191							
				67.980	.275							
				68.017	.274							
	Mean	. .	. .	68.021	68.255							
27	JAPETUS . . .	. .	20 31 54.31	0.30	20 31 18.45	24.63	−35.86	−35.67	3 A	2	H.	JAPETUS south, preceding SATURN. Sky thick and hazy.
			33 55.80	1.87	33 20.13	25.97	35.67	35.90				
			35 28.17	34.15	34 52.37	58.40	35.80	35.75				
			37 21.07	27.14	36 45.30	51.40	35.77	35.74				
			39 7.18	13.10	38 31.30	37.40	35.88	35.70				
			40 28.30	34.28	39 52.50	58.58	35.80	35.70				
			42 17.55	23.56	41 41.67	47.73	35.88	35.83				
			43 40.54	46.67	43 4.90	10.90	35.64	35.77				
			45 12.30	18.38	44 36.60	42.63	35.70	35.75				
			46 47.44	53.42	46 11.68	17.68	35.76	35.74				
			48 16.57	22.60	47 40.83	46.90	35.74	35.70				
			49 34.90	40.85	48 59.20	5.10	35.70	35.75				
			50 59.07	5.08	50 23.30	29.30	35.77	35.78				
			52 45.58	51.63	52 9.73	15.95	−35.85	−35.65				
	Mean	. .	. . .	. .	. . .	. .	−35.773	−35.747				
				62^{r}.653	63^{r}.150							
			h. m.	.707	.098							
			12 43.5	.682	.129							
				.746	.187							
				.704	.192							
	Mean	. .	. .	62.698	63.151							
	TITAN	. .	20 31 54.31	0.30	20 32 7.20	13.20	+12.89	+12.90	3 A	2	H.	TITAN south, following SATURN.
			33 55.80	1.87	34 8.80	14.65	13.00	12.78				
			35 28.17	34.15	35 40.90	46.93	12.73	12.78				
			37 21.07	27.14	37 33.87	39.85	12.80	12.71				
			39 7.18	13.10	39 19.87	25.90	12.69	12.80				
			40 28.30	34.28	40 41.00	47.15	12.70	12.87				
			42 17.55	23.56	42 30.23	36.27	12.68	12.69				
			43 40.54	46.67	43 53.35	59.33	12.81	12.66				
			45 12.30	18.38	45 25.20	31.10	12.90	12.72				
			46 47.44	53.46	47 0.22	6.20	12.78	12.78				
			48 16.57	22.60	48 29.30	35.30	12.73	12.70				
			49 34.90	40.85	49 47.57	53.70	12.67	12.85				
			50 59.07	5.08	51 11.80	17.80	12.73	12.72				
			52 45.58	51.63	52 58.25	4.37	+12.67	+12.74				
	Mean	. .	. . .	. .	. . .	. .	+12.770	+12.764				
				62^{r}.726	65^{r}.909							
			h. m.	.754	.979							
			12 50	.791	.982							
				.747	.856							
				.775	.910							
	Mean	. .	. .	62.759	65.927							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δ a		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
1875. July 29	JAPETUS . . .	. .	19 51 13.35	16.92	19 50 40.27	43.77	−33.08	−33.15	5 A	2	H.	JAPETUS south, preceding SATURN. Thin clouds and haze. Sidereal clock 10^{s} fast.
			52 26.85	30.38	51 53.75	57.30	33.10	33.08				
			53 50.20	53.70	53 17.00	20.55	33.20	33.15				
			55 12.80	16.40	54 39.65	43.23	33.15	33.17				
			56 52.08	55.62	56 18.80	22.45	33.28	33.17				
			58 15.75	19.42	57 42.70	46.35	33.05	33.07				
			59 27.10	30.68	58 53.95	57.50	33.15	33.18				
			20 27 37.13	41.98	20 27 4.00	8.75	33.13	33.23				
			29 6.00	10.66	28 32.77	37.50	33.23	33.16				
			30 35.96	40.70	30 2.85	7.53	33.11	33.17				
			32 17.98	22.70	31 44.90	49.60	33.08	33.10				
			34 8.19	12.86	33 35.00	39.80	33.19	33.06				
			35 36.60	41.32	35 3.47	8.25	33.13	33.07				
			36 57.80	2.51	36 24.72	29.40	−33.08	−33.11				
	Mean	. .	. . .	. .	. . .	. .	−33.140	−33.134				
				$68^{r}.067$	$68^{r}.342$							
			h. m.	.100	.463							
			20 9.6	.110	.468							
				.212	.576							
				.230	.600							
	Mean	. .	. .	68.144	68.490							
	HYPERION . .	. .	19 51 13.35	16.92	19 51 27.90	31.50	+14.55	+14.58	5 A	2	H.	HYPERION south, following SATURN. HYPERION very faint on account of thin clouds. Sidereal clock 10^{s} fast.
			52 26.85	30.38	52 41.30	45.00	14.45	14.62				
			53 50.20	53.70	54 4.67	8.10	14.47	14.40				
			55 12.80	16.40	55 27.23	31.00	14.43	14.60				
			58 15.75	19.42	58 30.22	34.00	14.47	14.58				
			59 27.10	30.68	19 59 41.73	45.38	14.63	14.70				
			20 27 37.13	41.98	20 27 51.33	56.35	14.20	14.37				
			30 35.96	40.70	30 50.40	55.05	14.44	14.35				
			32 47.98	22.70	32 32.60	37.28	14.62	14.58				
			34 8.19	12.86	34 22.63	27.30	14.44	14.44				
			35 36.60	41.32	35 51.00	55.80	14.40	14.48				
			36 57.80	2.51	20 37 12.35	17.13	+14.55	+14.62				
	Mean	. .	. . .	. .	. . .	. .	+14.471	+14.527				
				$68^{r}.275$	$72^{r}.291$							
			h. m.	.338	.432							
			20 18.0	.455	.358							
				.595	.614							
				.560	.508							
	Mean	. .	. .	68.445	72.441							
Aug. 25	JAPETUS . . . Beg. 19^{h} 51^{m}. Ends 20^{h} 13^{m}.	. .	19 55 0.04	5.26	19 55 35.00	40.30	+34.96	+35.04	3 A	2	H.	JAPETUS north, following SATURN. Seeing bad. Chron. corr., — $0^{m}.6$.
			56 7.85	12.82	56 42.74	47.80	34.89	34.98				
			57 13.53	8.70	57 48.50	53.70	34.97	35.00				
			58 22.94	28.01	58 58.00	2.98	35.06	34.97				
			20 0 4.62	9.71	20 0 39.68	44.60	35.06	34.89				
			1 10.95	16.03	1 45.82	51.00	34.87	34.97				
			2 31.01	36.15	3 6.00	11.17	34.99	35.02				
			3 48.30	53.47	4 23.04	28.47	35.10	35.00				
			4 54.50	59.66	5 29.52	34.57	35.02	34.91				
			6 38.97	44.10	7 13.85	19.15	34.88	35.05				
			7 49.18	54.33	8 24.03	29.48	35.12	35.15				
			9 25.81	30.86	10 0.08	6.00	34.99	35.14				
			10 31.89	37.02	20 11 6.87	12.00	+34.98	+34.98				
	Mean	. .	. . .	. .	. . .	. .	+34.992	+35.008				
				$70^{r}.170$	$69^{r}.279$							
			h. m.	.140	.232							
			10 7	.174	.347							
				.212	.320							
				.206	.353							
	Mean	. .	. .	70.180	69.306							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δα		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
Aug. 26	Hyperion . .	270	20 5 26.21	29.48	20 5 13.30	16.53	−12.91	−12.95	5 A	3	H.	Hyperion south, preceding Saturn, and rather faint.
	Beg. at 19^h 56^m.		6 54.85	58.13	6 41.83	45.00	13.02	13.13				
			8 22.49	25.70	8 9.50	12.75	12.99	12.95				
			9 48.23	51.52	9 35.35	38.68	12.88	12.84				
			13 30.35	33.44	13 17.40	20.77	12.95	12.67				
			15 15.23	18.38	15 2.15	5.43	13.08	12.95				
			17 10.43	13.70	16 57.60	0.82	12.83	12.88				
			19 8.75	11.97	18 55.82	59.30	12.93	12.67				
			20 38.19	41.45	20 25.30	28.40	12.89	13.05				
			21 55.35	58.62	21							
			23 23.66	26.90	23 10.75	14.00	−12.91	−12.90				
	Mean	. .	. . .	. .		. .	−12.939	−12.899				
				$66^r.004$	$66^r.268$							
			h. m.	.073	.249							
			10 16	.100	.249							
				.120	.310							
				.130	.334							
	Mean	. .	. .	66.085	66.282							
	Titan . . .	90	20 5 26.21	29.48	20 5 38.47	41.70	+12.26	+12.22	5 A	3	H.	Titan south, following Saturn.
			6 54.85	58.13	7 7.00	10.30	12.15	12.17				
			8 22.49	25.70	8 34.63	38.00	12.14	12.30				
			9 48.23	51.52	10 0.50	3.80	12.27	12.28				
			13 30.35	33.44	13 42.43	45.70	12.08	12.26				
			15 15.23	18.38	15 27.37	30.68	12.14	12.30				
			17 10.43	13.70	17 22.80	25.95	12.37	12.25				
			19 8.75	11.97	19 20.97	24.20	12.12	12.23				
			20 38.19	41.45	20 50.42	53.63	12.23	12.18				
			21 55.35	58.62	22 7.70	10.80	12.35	12.18				
			23 23.66	26.90	23 35.80	39.15	+12.14	+12.25				
	Mean	. .		. .	. . .	. .	+12.205	+12.238				
				$66^r.160$	$66^r.275$							
			h. m.	.182	.320							
			10 24	.170	.321							
				.194	.350							
				.192	.352							
	Mean	. .	. .	66.180	66.324							
	Japetus . . .	90	20 5 26.21	29.48	20 6 2.25	5.70	+36.04	+36.22	5 A	3	H.	Japetus north, following Saturn.
			6 54.85	58.13	7 30.93	34.25	36.08	36.12				
			8 22.49	25.70	8 58.63	1.93	36.14	36.23				
			9 48.23	51.52	10 24.47	27.70	36.24	36.18				
			13 30.35	33.34	14 6.45	9.63	36.10	36.19				
			15 15.23	18.38	15 51.37	54.55	36.14	36.17				
			17 10.43	13.70	17 46.68	49.87	36.25	36.17				
			19 8.75	11.97	19 44.90	48.25	36.15	36.28				
			20 38.19	41.45	21 14.30	17.65	36.11	36.20				
			21 55.35	58.62	22 31.58	34.85	36.23	36.23				
			20 23 23.66	26.90	20 23 59.75	3.00	+36.09	+36.10				
	Mean	. .	20 14.8	. .	. . .	. .	+36.143	+36.190				
				$65^r.620$	$66^r.300$							
			h. m.	.583	.335							
			10 35	.660	.390							
				.660	.405							
				.716	.492							
	Mean	. .	. .	65.648	66.384							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δa		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
Aug. 29	JAPETUS . . .	. .	20 9 42.23	47.21	20 10 20.05	25.05	+37.83	+37.84	4 A	3	H.	JAPETUS north, following SATURN. Sky cleared up after heavy rain and much moisture, and JAPETUS faint at times. Parallel (Ver. I) = 186°.37 (by 3 transits).
			10 47.64	52.61	11 25.70	30.60	38.06	37.99				
			11 54.40	59.36	12 32.40	37.25	38.00	37.89				
			13 56.43	1.33	14 34.23	39.15	37.80	37.82				
			15 38.21	43.14	16 16.15	21.00	37.94	37.86				
			16 48.35	53.35	17 26.35	31.20	38.00	37.85				
			18 7.10	11.96	18 44.90	49.80	37.80	37.84				
			19 52.23	57.10	20 29.97	34.87	37.74	37.77				
			21 15.10	20.08	22 53.00	57.85	37.90	37.77				
			23 4.85	9.66	23 42.62	47.62	37.77	37.96				
			24 44.20	49.13	25 21.90	26.87	37.70	37.74				
			27 59.97	4.72	28 37.60	42.50	37.63	37.78				
			29 26.83	31.80	30 4.65	9.53	37.82	37.73				
			35 43.48	48.30	36 21.33	26.15	37.85	37.85				
			38 51.30	56.22	39 29.00	34.00	37.70	37.78				
			40 15.91	20.78	40 53.78	58.67	37.87	37.89				
			41 21.13	26.01	41 58.90	3.90	37.77	37.89				
			42 57.08	2.02	43 34.87	39.93	+37.79	+37.91				
	Mean	. .	. . .	. .	. . .	. .	+37.832	+37.842				
		90		$67^{r}.880$	$67^{r}.474$							
			h. m.	.880	.509							
			10 22	.884	.474							
				.900	.549							
				68.001	.570							
	Mean	. .	. .	67.909	67.515							
30	JAPETUS . . .	. .	20 45 10.65	14.65	20 45 48.50	52.53	+37.85	+37.88	3 A	2	H.	JAPETUS north, following SATURN.
			46 16.42	20.38	46 54.45	58.40	38.03	38.02				
			47 31.28	35.16	48 9.30	13.30	38.02	38.04				
			50 33.15	37.18	51 11.20	15.00	38.05	37.82				
			51 50.18	54.09	52 28.15	32.25	37.97	38.16				
			53 9.60	13.62	53 47.50	51.52	37.90	37.90				
			57 31.22	35.21	58 9.20	13.20	37.98	37.99				
			58 51.04	55.06	59 29.00	33.00	37.96	37.94				
			21 0 12.70	16.62	21 0 50.53	54.56	37.83	37.94				
			6 28.44	32.35	7 6.32	10.40	37.88	38.05				
			7 40.40	44.29	8 18.35	22.40	37.95	38.11				
			10 45.36	49.30	11 23.30	27.30	37.94	38.00				
			12 8.07	12.05	12 46.00	50.00	+37.93	+37.95				
	Mean	. .		. .	. . .	. .	+37.945	+37.985				
		90		$65^{r}.780$	$65^{r}.493$							
			h. m.	.730	.439							
			10 50	.670	.460							
				.735	.512							
				.669	.448							
	Mean	. .	. .	65.717	65.470							
31	JAPETUS . . .	. .	19 51 4.30	9.10	19 51 41.90	46.75	+37.60	+37.65	3 A	3	H.	JAPETUS north, following SATURN.
			52 21.00	25.62	52 58.47	3.40	37.47	37.78				
			53 44.20	48.95	54 21.88	26.68	37.68	37.73				
			55 14.81	19.50	55 52.45	57.15	37.64	37.65				
			57 1.17	5.81	57 38.80	43.60	37.63	37.79				
			58 14.67	19.45	58 52.35	57.15	37.68	37.70				
			59 28.50	33.21	20 0 6.17	10.96	37.67	37.75				
			20 0 52.50	57.21	1 30.20	34.90	37.70	37.69				
			2 16.58	21.31	2 54.25	59.00	37.67	37.69				
			3 40.70	45.34	4 18.30	23.00	37.60	37.66				
			5 14.75	19.53	5 52.60	57.30	37.85	37.77				
			7 16.76	21.71	7 54.60	59.35	+37.84	+37.64				
	Mean	. .		. .	. . .	. .	+37.669	+37.708				
		90		$66^{r}.418$	$66^{r}.354$							
			h. m.	.461	.320							
			9 39	.426	.351							
				.485	.363							
				.594	.560							
	Mean	. .	. .	66.477	66.390							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δ *a*		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
			h. m. s.	s.	h. m. s.	s.	s.	s.				
1875. Aug. 31	HYPERION . .	. .	20 2 16.58	21.31	20 2 9.47	14.40	− 7.11	− 6.91	3 A	3	H.	HYPERION north, preceding SATURN. HYPERION faint.
			3 40.70	45.34	3 33.60	38.38	7.10	6.96				
			5 14.75	19.53	5 7.60	12.60	7.15	− 6.93				
			7 16.76	21.71	7 9.93	. .	− 6.83					
	Mean	. .	. . .	. .	. . .	. .	− 7.047	− 6.933				
			h. m.	66^{r}.660	60^{r}.545							
			9 46	.659	.544							
				.637	.568							
	Mean	. .	. .	66.652	60.552							
Sept. 1	JAPETUS . . .	. .	21 44 18.88	23.12	21 44 56.15	0.32	+37.27	+37.20	3 A	4	H.	JAPETUS south, following SATURN.
			45 23.19	27.78	46 0.60	5.00	37.21	37.22				
			46 44.10	48.31	47 21.32	25.60	37.22	37.29				
			48 14.76	19.07	48 51.97	56.30	37.21	37.23				
			49 53.40	57.67	50 30.73	34.95	37.33	37.28				
			51 13.79	18.06	51 51.00	55.25	37.21	37.19				
			52 40.37	44.68	53 17.63	21.90	37.26	37.22				
			54 18.80	23.07	54 56.00	0.38	37.20	37.31				
			55 41.87	46.14	56 19.05	23.28	37.18	37.14				
			57 35.30	39.61	58 12.58	16.90	37.28	37.29				
			58 56.35	0.63	59 33.60	37.96	+37.25	+37.33				
	Mean	. .	. . .	. .	. . .	. .	+37.238	+37.245				
		90		66^{r}.618	66^{r}.708							
			h. m.	.580	.621							
			11 27	.490	.530							
				.409	.480							
				.395	.481							
	Mean	. .	. . .	66.498	66.564							
2	JAPETUS . . .	. .	20 2 50.72	55.30	20 3 27.36	31.80	+36.66	+36.50	3 A	3	H.	JAPETUS south, following SATURN.
			4 16.58	21.10	4 53.05	57.65	36.47	36.55				
			6 8.55	13.22	6 45.00	49.70	36.45	36.48				
			7 33.48	38.05	8 9.93	14.53	36.45	36.48				
			8 57.60	2.27	9 34.25	38.80	36.65	36.53				
			11 11.82	16.43	11 48.55	53.00	36.73	36.57				
			12 33.70	38.30	13 10.20	14.75	36.50	36.45				
			15 15.00	19.56	15 51.55	55.97	36.55	36.41				
			16 44.93	49.44	17 21.33	26.00	36.40	36.51				
			18 15.33	19.93	18 51.95	56.40	36.62	36.47				
			19 51.05	55.62	20 27.60	32.20	36.55	36.58				
			22 17.31	21.95	22 53.85	58.45	36.54	36.50				
			23 42.07	46.62	24 18.73	23.20	36.66	36.58				
			25 1.10	5.72	25 37.70	42.20	36.60	36.48				
			26 25.33	29.90	27 1.90	6.50	36.57	36.60				
			27 36.18	40.85	28 12.70	17.20	36.52	36.35				
			28 52.23	56.85	20 29 28.70	33.25	+36.47	+36.40				
	Mean	. .	. . .	. .	. . .	. .	+36.552	+36.498				
		90		66^{r}.886	67^{r}.070							
			h. m.	.824	.108							
			9 55	.972	.230							
				67.022	.196							
				.024	.260							
	Mean	. .	. .	66.946	67.173							
3	TITAN. . . .	. .	19 41 10.86	14.69	19 40 59.70	3.45	−11.16	−11.24	3 A	4	H.	TITAN south, preceding SATURN. Chron. corr., — 0^{m}.7.
			42 48.40	52.15	42 37.18	40.95	11.22	11.20				
			44 5.10	8.98	43 53.85	57.70	11.25	11.28				
			45 46.50	50.26	45 35.20	39.00	11.30	11.26				
			47 40.26	44.00	47 29.00	32.73	11.26	11.27				
			49 50.53	54.25	49 39.28	43.00	11.25	11.25				
			52 15.05	18.81	52 3.75	7.60	11.30	11.21				
			54 0.38	4.17	53 49.17	52.90	11.21	11.27				
			55 29.73	33.52	55 18.50	22.28	11.23	11.24				
			57 45.16	48.90	57 33.88	37.70	−11.28	−11.20				
	Mean	. .	. . .	. .	. . .	. .	−11.246	−11.242				

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δa		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875. Sept. 3	. . . .	° . .		$66^{r}.400$	$66^{r}.770$							
			h. m.	.506	.913							
			9 19	.488	.921							
				.605	.970							
				.613	.985							
	Mean	. .	. .	66.522	66.912							
			h. m. s.	s.	h. m. s.	s.	s.	s.				
	Japetus	. .	19 41 10.86	14.69	19 41 46.60	50.30	+35.74	+35.61	3 A	4	H.	Japetus south, following Saturn.
			42 48.40	52.15	43 24.05	27.80	35.65	35.65				Chron. corr., $-0^{m}.7$.
			44 5.10	8.98	44 40.80	44.50	35.70	35.52				Telescope east of pier.
			45 46.50	50.26	46 22.18	26.00	35.68	35.74				
			47 40.26	44.00	48 15.85	19.60	35.59	35.60				
			49 50.53	54.25	50 26.25	30.00	35.72	35.75				
			52 15.05	18.81	52 50.68	54.43	35.63	35.62				
			54 0.38	4.17	54 36.07	39.80	35.69	35.63				
			55 29.73	33.52	56 5.48	9.25	35.75	35.73				
			57 45.16	48.90	58 20.80	24.70	+35.64	+35.80				
	Mean	. .	. . .	. .	. . .	. .	+35.679	+35.665				
				$66^{r}.637$	$67^{r}.030$							
			h. m.	.721	.085							
			9 27	.691	.104							
				.734	.126							
				.755	.131							
	Mean	. .	. .	66.708	67.095							
4	Titan.	. .	20 14 58.72	4.08	20 14 46.00	51.30	−12.72	−12.78	3 A	2	H.	Titan north, preceding Saturn.
			16 24.48	29.82	16 11.75	17.05	12.73	12.77				Chron. corr., $-0^{m}.7$.
			17 43.60	48.78	17 30.90	36.20	12.70	12.58				
			19 12.70	18.00	19 0.00	5.35	12.70	12.65				
			20 36.49	51.68	20 33.77	39.13	12.72	12.55				
			22 19.62	24.94	22 7.00	12.27	12.62	12.67				
			23 52.19	57.56	23 39.60	44.88	12.59	12.68				
			25 6.48	11.70	24 53.73	59.00	12.75	12.70				
			26 34.21	39.42	26 21.60	26.83	12.61	12.69				
			27 59.46	4.72	27 46.75	52.00	12.71	12.72				
			29 47.50	52.76	29 34.75	40.13	12.75	12.63				
			31 18.59	23.81	31 5.95	11.05	−12.64	−12.76				
	Mean	. .	. . .	. .	. . .	. .	−12.687	−12.682				
				$68^{r}.290$	$66^{r}.645$							
			h. m.	.470	.890							
			9 44	.410	.817							
				.521	.920							
				.625	.935							
	Mean	. .	. .	68.463	66.841							
	Japetus . . .	. .	20 14 58.72	4.08	20 15 33.23	38.45	+34.51	+34.37	3 A	2	H.	Japetus south, following Saturn.
			16 24.48	29.82	16 59.00	4.30	34.52	34.48				Bad images to-night.
			17 43.60	48.78	18 18.00	23.25	34.40	34.47				Chron. corr., $-0^{m}.7$.
			19 12.70	18.00	19 47.20	52.40	34.50	34.40				
			20 36.49	51.68	21 21.00	26.28	34.51	34.60				
			22 19.62	24.94	22 54.00	59.37	34.38	34.43				
			23 52.19	57.56	24 26.70	32.00	34.51	34.44				
			25 6.48	11.70	25 41.00	46.15	34.52	34.45				
			26 34.21	39.42	27 8.68	13.90	34.47	34.48				
			27 59.46	4.72	28 33.80	39.20	34.34	34.48				
			29 47.50	52.76	30 21.95	27.30	34.45	34.54				
			31 18.59	23.81	31 53.00	58.30	+34.41	+34.49				
	Mean	. .	. . .	. .	. . .	. .	+34.460	+34.469				
				$68^{r}.664$	$69^{r}.099$							
			h. m.	.611	.133							
			9 59	.688	.190							
				.738	.182							
				.634	.165							
	Mean	. .	. .	68.667	69.154							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δα		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
Sept. 6	Titan	285	20 16 4.12	8.18	20 15 54.90	58.90	− 9.22	− 9.28	3 A	2	H.	Titan north, preceding Saturn. Bad images of Saturn. Chron. corr., + $0^{\mathrm{m}}.6$.
			17 31.80	35.69	17 22.43	26.45	9.37	9.24				
			18 50.32	54.27	18 41.05	45.00	9.27	9.27				
			20 19.10	22.95	20 9.75	13.80	9.35	9.15				
			22 25.68	29.70	22 16.30	20.38	9.38	9.32				
			23 37.23	41.25	23 28.00	31.97	9.23	9.28				
			26 41.59	45.62	26 32.25	36.20	9.34	9.42				
			28 10.35	14.35	28 0.92	5.00	9.45	9.35				
			29 45.75	49.65	29 36.38	40.30	9.37	9.35				
			31 12.31	16.30	31 3.00	7.00	9.31	9.30				
			33 3.51	7.31	32 54.20	18.10	9.31	9.21				
			34 57.18	1.14	34 47.87	51.90	9.31	9.24				
			36 39.31	43.20	36 29.90	33.90	9.41	9.30				
			37 53.33	57.29	37 44.00	48.00	− 9.33	− 9.29				
	Mean	. .	. . .	. .	. . .	. .	− 9.332	− 9.286				
				$65^{\mathrm{r}}.053$	$69^{\mathrm{r}}.486$							
			h. m.	.050	.469							
			9 47	.132	.520							
				.120	.528							
				.148	.531							
	Mean	. .	. .	65.101	69.507							
	Japetus . . .	90	20 16 4.12	8.18	20 16 35.60	39.60	+31.48	+31.42	3 A	3	H.	Japetus south, following Saturn. Chron. corr., + $0^{\mathrm{m}}.6$.
			17 31.80	35.69	18 3.27	7.23	31.47	31.54				
			18 50.32	54.27	19 21.80	25.83	31.48	31.56				
			20 19.10	22.95	20 50.60	54.60	31.50	31.65				
			22 25.68	29.70	22 57.22	1.20	31.54	31.50				
			23 37.23	41.25	24 8.90	12.73	31.66	31.48				
			26 41.59	45 62	27 13.20	17.05	31.61	31.43				
			28 10.35	14.35	28 41.83	45.88	31.48	31.53				
			29 45.75	49.65	30 17.20	21.26	31.45	31.61				
			31 12.31	16.30	31 43.87	47.87	31.56	31.57				
			33 3.51	7.31	33 34.83	38.83	31.32	31.52				
			34 57.18	1.14	35 28.75	32.68	31.57	31.54				
			36 39.31	43.20	37 10.75	14.83	31.44	31.63				
			37 53.33	57.29	38 24.90	28.88	+31.57	+31.59				
	Mean	. .	. . .	. .	. . .	. .	+31.510	+31.541				
				$69^{\mathrm{r}}.514$	$70^{\mathrm{r}}.338$							
			h. m.	.537	.413							
			9 56	.582	.420							
				.603	.380							
				.580	.387							
	Mean	. .	. .	69.563	70.388							
7	Hyperion . .	. .	20 6 42.66	45.71	20 6 59.40	2.30	+16.74	+16.59	5 A	3	H.	Hyperion south, following Saturn. Chron. corr., + $0^{\mathrm{m}}.6$.
			8 4.03	7.11	8 20.60	23.75	16.57	16.64				
			9 20.20	23.20	9 36.70	39.73	16.50	16.53				
			12 2.45	5.45	12 18.86	22.00	16.41	16.55				
			13 9.49	12.58	13 25.90	29.00	16.41	16.42				
			14 23.23	26.29	14 39.75	42.87	16.46	16.58				
			15 35.68	38.70	15 52.20	55.23	16.52	16.53				
			17 8.63	11.73	17 25.20	28.43	16.57	16.70				
			18 28.42	31.65	18 45.20	48.40	16.78	16.75				
			19 53.29	56.40	20 9.87	13.00	16.58	16.60				
			21 5.60	8.69	21 22.05	25.20	16.45	16.51				
			22 32.41	35.56	22 49.13	52.00	+16.72	+16.44				
	Mean	. .	. . .	. .	. . .	. .	+16.559	+16.570				
				$62^{\mathrm{r}}.190$	$62^{\mathrm{r}}.830$							
			h. m.	.185	.898							
			9 30	.162	.870							
				.176	.850							
				.189	.928							
	Mean	. .	. .	62.180	62.875							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δα		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
Sept. 7	JAPETUS . . .	. .	20 6 42.66	45.71	20 7 12.50	15.47	+29.84	+29.76	5 A	4	H.	JAPETUS south, following SATURN.
			8 4.03	7.11	8 33.83	36.80	29.80	29.69				Chron. corr., + $0^{m}.6$.
			9 20.20	23.20	9 49.85	53.00	29.65	29.80				
			12 2.45	5.45	12 32.30	35.23	29.85	29.78				
			13 9.49	12.58	13 39.23	42.30	29.74	29.72				
			14 23.23	26.29	14 52.90	55.95	29.67	29.66				
			15 35.68	38.70	16 5.40	8.52	29.72	29.82				
			17 8.63	11.70	17 38.30	41.42	29.67	29.69				
			18 28.42	31.65	19 58.30	1.38	29.88	29.73				
			19 53.29	56.40	20 23.00	26.17	29.71	29.77				
			21 5.60	8.69	21 35.28	38.38	29.68	29.69				
			22 32.41	35.56	23 2.00	5.30	+29.59	+29.74				
	Mean	. .	. . .	. .	. . .	. .	+29.733	+29.737				
				$62^{r}.169$	$63^{r}.260$							
			h. m.	.158	.221							
			9 37	.184	.252							
				.192	.223							
				.161	.274							
	Mean	. .	. .	62.173	63.246							
8	HYPERION . .	95	20 29 25.63	29.54	20 29 42.45	46.18	+16.82	+16.64	3 A	3	H.	HYPERION south, following SATURN.
			30 25.06	28.95	30 41.78	45.60	16.72	16.65				Chron. corr., + $0^{m}.7$.
			31 22.45	26.26	31 39.25	43.00	16.80	16.74				
			32 33.19	37.00	32 49.90	53.73	16.71	17.02				
			33 40.18	43.99	33 56.88	0.80	16.70	16.81				
			34 36.69	40.55	34 53.45	57.22	16.76	16.67				
			35 43.00	46.90	35 59.97	3.68	16.97	16.78				
			37 7.94	11.82	37 24.80	28.65	16.86	16.83				
			38 8.58	12.54	38 25.43	29.15	16.85	16.61				
			39 4.03	7.90	39 20.85	24.70	16.82	16.80				
			40 0.87	4.65	40 17.55	21.30	+16.68	+16.65				
	Mean	. .	. . .	. .	. . .	. .	+16.790	+16.745				
				$67^{r}.364$	$69^{r}.482$							
			h. m.	.411	.477							
			9 43	.347	.565							
				.480	.644							
				.498	.660							
	Mean	. .	. .	67.420	69.566							
	JAPETUS . . .	90	20 29 25.63	29.54	20 29 53.40	57.23	+27.77	+27.69	3 A	3	H.	JAPETUS south, following SATURN.
			30 25.06	28.95	30 52.90	56.60	27.84	27.65				Chron. corr., + $0^{m}.7$.
			31 22.45	26.26	31 50.18	54.00	27.73	27.74				
			32 33.19	37.00	33 0.86	4.73	27.67	27.73				
			33 40.18	43.99	34 7.83	11.70	27.65	27.71				
			34 36.69	40.55	35 4.40	8.30	27.71	27.75				
			35 43.00	46.90	36 10.77	14.65	27.77	27.75				
			37 7.94	11.82	37 35.58	39.40	27.64	27.58				
			38 8.58	12.54	38 36.28	40.20	27.70	27.66				
			39 4.03	7.90	39 31.77	35.53	27.74	27.63				
			40 0.87	4.65	40 28.48	32.33	+27.61	+27.68				
	Mean	. .	. . .	. .	. . .	. .	+27.712	+27.688				
				$67^{r}.489$	$68^{r}.534$							
			h. m.	.561	.618							
			9 52	.540	.628							
				.553	.630							
				.459	.548							
	Mean	. .	. .	67.520	68.592							
9	JAPETUS . . .	90	20 18 0.96	5.12	20 18 26.50	30.58	+25.54	+25.46	3 A	3	H.	JAPETUS south, following SATURN.
			18 51.21	55.32	19 16.70	20.90	25.49	25.58				Chron. corr., = + $0^{m}.7$.
			19 55.65	59.71	20 21.20	25.23	25.55	25.52				Parallel = 346°.33.
			21 24.06	28.09	21 49.48	53.70	25.42	25.61				
			22 16.34	20.46	22 41.90	46.00	25.56	25.54				
			23 10.59	14.71	23 36.20	40.30	25.61	25.59				
			24 12.20	16.27	24 37.63	41.75	25.43	25.48				
			25 10.30	14.46	25 35.76	40.00	25.46	25.54				
			26 25.59	29.63	26 51.20	55.38	25.61	25.75				
			29 43.05	47.18	30 8.63	12.75	25.58	25.57				
			31 6.00	10.13	31 31.50	35.70	+25.50	+25.57				
	Mean	. .	. . .	. .	. . .	. .	+25.523	+25.565				

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δα		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°										
Sept. 9	Japetus . . .	90		68^{r}.246	69^{r}.462							
			h. m.	.268	.464							
			10 48	.269	.540							
				.283	.519							
				.350	.581							
	Mean	. .	. .	68.283	69.513							
			h. m. s.	s.	h. m. s.	s.	s.	s.				
	Hyperion . .	100	20 29 43.05	47.18	20 29 58.80	3.18	+15.75	+16.00	3 A	2	H.	Hyperion south, following Saturn. Hyperion *very faint* during transit observations. Haze or thin clouds. Chron. corr., +0^{m}.7.
			31 6.00	10.12	31 21.65	26.00	15.65	15.88				
			44 11.97	16.13	44 27.65	31.83	15.68	15.70				
			45 12.68	16.81	45 28.40	32.82	15.72	16.01				
			46 22.85	26.97	46 38.60	42.88	15.75	15.91				
			47 15.72	19.82	47 31.50	35.70	15.78	15.88				
			48 0.08	4.15	48 16.05	19.80	+15.97	+15.65				
	Mean	. .	. . .	. .	. . .	. .	+15.757	+15.861				
			h. m.	68^{r}.125	71^{r}.547							
			10 41	.450	.964							
				.081	.688							
	Mean	. .	. .	68.219	71.733							
11	Titan . . .	90	20 58 19.63	23.31	20 58 31.97	35.70	+12.34	+12.39	3 A	3	H.	Titan south, following Saturn. Chron. corr., +0^{m}.7.
			59 12.21	16.10	29 24.50	28.42	12.29	12.32				
			21 0 31.09	34.98	21 0 43.46	47.33	12.37	12.35				
			1 54.70	58.63	2 7.00	11.00	12.30	12.37				
			3 19.36	23.27	3 31.80	35.58	12.44	12.31				
			4 10.95	14.80	4 23.25	27.15	12.30	12.35				
			5 44.88	48.71	5 57.16	1.00	12.28	12.29				
			6 33.80	37.70	6 46.15	50.00	12.35	12.30				
			7 32.38	36.25	. . .	. .	. .	. .				
			8 30.25	34.12	8 42.58	46.35	12.33	12.23				
			9 24.26	28.19	9 36.65	40.37	12.39	12.18				
			10 16.35	20.31	10 28.75	32.70	12.40	12.39				
			11 12.38	16.21	11 24.70	28.57	+12.32	+12.36				
	Mean	. .	. . . .	. .	. . .	. .	+12.343	+12.320				
				68^{r}.012	68^{r}.249							
			h. m.	67.946	.132							
			9 59	67.983	.174							
				67.970	.171							
				68.000	.143							
	Mean	. .	. . .	67.982	68.174							
	Japetus . . .	93	20 58 19.63	23.31	20 58 40.27	44.23	+20.64	+20.92	3 A	3	H.	Japetus south, following Saturn. Chron. corr., + 0^{m}.7.
			59 12.21	16.10	59 33.00	36.83	20.79	20.73				
			21 0 31.09	34.98	21 0 51.95	55.73	20.86	20.75				
			2 54.70	58.63	2 15.38	19.30	20.68	20.67				
			3 19.36	23.27	3 40.16	44.00	20.80	20.73				
			4 10.95	14.80	4 31.80	35.63	20.85	20.83				
			5 44.88	48.71	6 5.52	9.40	20.64	20.69				
			6 33.80	37.70	6 54.50	58.45	20.70	20.75				
			7 32.38	36.25	7 53.00	57.00	20.62	20.75				
			8 30.25	34.12	8 50.90	54.87	20.65	20.75				
			9 24.26	28.19	9 45.00	48.92	20.74	20.73				
			10 16.35	20.31	10 37.22	41.05	20.87	20.74				
			11 12.38	16.21	11 33.15	37.05	+20.77	+20.84				
	Mean	. .	. . .	. .	. . .	. .	+20.739	+20.760				
				67^{r}.966	69^{r}.402							
			h. m.	67.984	.412							
			10 6	67.978	.425							
				68.000	.371							
				67.993	.436							
	Mean	. .	. .	67.984	69.409							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δα		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
		°	h. m. s.	s.	h. m. s.	s.	s.	s				
1875. Sept. 27	JAPETUS . . .	265	21 28 7.90	12.58	21 27 44.28	49.00	−23.62	−23.58	3	3	H.	JAPETUS south, preceding SATURN. Chron. corr., $0^{\mathrm{m}}.0$.
			29 42.10	46.88	29 18.47	23.30	23.63	23.58				
			31 30.48	35.28	31 6.96	11.58	23.52	23.70				
			32 35.70	40.56	32 12.23	17.00	23.47	23.56				
			34 10.26	15.10	33 46.75	51.50	23.51	23.60				
			37 20.62	25.29	36 57.00	1.78	23.62	23.51				
			38 36.35	41.12	38 12.75	17.46	23.60	23.56				
			39 52.26	57.06	39 28.58	33.40	23.68	23.66				
			41 25.07	29.81	41 1.43	6.25	23.64	23.56				
			43 2.15	6.91	42 38.55	43.30	−23.60	−23.61				
	Mean	. .	. . .	. .	. . .	. .	−23.589	−23.592				
				$67^{\mathrm{r}}.163$	$68^{\mathrm{r}}.696$							
			h. m.	.141	.670							
			9 39	.137	.643							
				67.005	.520							
				66.988	.528							
	Mean	. .	. .	67.087	68.611							
	HYPERION . .	90	21 28 7.90	12.58	21 28 21.73	26.62	+13.83	+14.04	3	2	H.	HYPERION north, following SATURN. Chron. corr., $0^{\mathrm{m}}.0$.
			29 42.10	46.88	29 56.20	0.97	14.10	14.09				
			31 30.48	35.28	31 44.70	49.32	14.22	14.04				
			32 35.70	40.56	32 49.68	54.60	13.98	14.04				
			34 10.26	15.10	34 24.42	29.15	14.16	14.05				
			37 20.62	25.29	37 34.53	39.40	13.91	14.11				
			38 36.35	41.12	38 50.28	55.18	13.93	14.06				
			39 52.26	57.06	40 6.35	11.20	14.09	14.14				
			41 25.07	29.81	41 39.15	43.82	14.08	14.01				
			43 2.15	6.91	43 16.25	20.93	+14.10	+14.02				
	Mean	. .	. . .	. .	. . .	. .	+14.040	+14.060				
				$67^{\mathrm{r}}.130$	$65^{\mathrm{r}}.430$							
			h. m.	.160	.700							
			9 52	.182	.686							
				.120	.564							
				.078	.579							
	Mean	. .	. .	67.134	65.592							
	TITAN	95	21 44 40.09	44.88	21 44 52.48	57.00	+12.39	+12.12	3	2	H.	TITAN south, following SATURN. Chron. corr., $0^{\mathrm{m}}.0$. Images fair, but illumination of wires not good. Lamp out of order.
			45 29.78	34.57	45 41.98	46.73	12.20	12.16				
			47 21.12	25.93	47 33.37	38.25	12.25	12.32				
			48 8.54	13.33	48 20.85	25.52	12.31	12.19				
			49 3.36	8.11	49 15.60	20.37	12.24	12.26				
			49 51.19	55.99	50 3.38	8.13	+12.19	+12.14				
	Mean	. .	. . .	. .	. . .	. .	+12.263	+12.198				
				$67^{\mathrm{r}}.102$	$67^{\mathrm{r}}.300$	. .	. . .	. . .	.	.	.	Non-achromatic eye-piece used on this date.
			h. m.	66.970	.043							
			10 4	.844	.070							
				.860	.146							
				67.003	.308							
	Mean	. .	. .	66.756	67.173							
29	JAPETUS . . .	270	21 34 43.63	47.52	21 34 15.92	19.80	−27.71	−27.72	3 A	3	H.	JAPETUS south, preceding SATURN. Chron. corr., $0^{\mathrm{m}},2$.
			36 4.13	8.04	35 36.35	40.25	27.78	27.79				
			37 23.00	27.75	36 55.20	59.90	27.80	27.85				
			40 5.52	10.28	39 37.70	42.50	27.82	27.78				
			41 37.18	41.98	41 9.40	14.20	27.78	27.78				
			42 55.95	0.68	42 28.15	32.93	27.80	27.75				
			44 13.54	18.35	43 45.77	50.55	27.77	27.80				
			45 29.50	34.30	45 1.70	6.45	27.80	27.85				
			46 50.68	55.34	46 22.85	27.57	27.83	27.77				
			48 11.35	16.20	47 43.63	48.40	27.72	27.80				
			51 4.95	9.65	50 37.05	41.80	27.90	27.85				
			52 24.46	29.14	51 56.67	1.45	27.79	27.69				
			53 48.66	53.38	53 20.80	25.58	27.86	27.80				
			55 14.19	18.91	54 46.43	51.15	−27.76	−27.76				
	Mean	. .	. . .	. .	. . .	. .	−27.797	−27.785				

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δα		Eye-piece.	Image.	Observer.	Remarks.
			Wire.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
		°										
1875. Sept. 29	JAPETUS . . .	. .	. .	$65^{r}.461$	$66^{r}.844$							
			h. m.	.380	.665							
			9 33	.314	.666							
				.435	.824							
				.437	.747							
	Mean		. .	65.405	66.749							
		. .	h. m. s.	s.	h. m. s.	s.	s.	s.				
	TITAN . . .	100	21 34 43.63	47.52	21 34 55.75	59.60	+12.12	+12.08	3 A	2	H.	TITAN south, following SATURN.
			36 4.13	8.04	36 16.22	20.15	12.09	12.11				Chron. corr., $-0^{m}.2$.
			37 23.00	27.75	37 35.05	39.80	12.05	12.05				
			40 5.52	10.28	40 17.60	22.30	12.08	12.02				
			41 37.18	41.98	41 49.30	54.00	12.12	12.02				
			42 55.95	0.68	43 8.00	12.83	12.05	12.17				
			44 13.54	18.35	44 25.60	30.38	12.06	12.03				
			45 29.50	34.30	45 41.58	46.32	12.08	12.02				
			46 50.68	55.34	47 2.78	7.46	12.10	12.12				
			48 11.35	16.20	48 23.55	28.23	12.20	12.03				
			51 4.95	9.65	51 16.90	21.70	11.95	12.05				
			52 24.46	29.14	52 36.48	41.28	12.02	12.14				
			53 48.66	53.38	54 0.75	5.50	12.09	12.12				
			55 14.19	18.91	55 26.30	31.00	+12.11	+12.09				
	Mean	. .	. . .	. .	. . .	. .	+12.080	+12.075				
				$65^{r}.382$	$69^{r}.138$							
			h. m.	.377	.100							
			9 43	.306	68.973							
				.158	.962							
				.150	.849							
	Mean	. .	. .	65.275	69.004							
	HYPERION . .	95	21 34	47.52	21 35	4.00	. .	+16.48	3 A	3	H.	HYPERION south, following SATURN.
			36	8.04	36	24.48	. .	16.44				Chron. corr., $-0^{m}.2$.
			37	23.00	37	44.23	. .	16.48				[Only Wire II observed.]
			40	10.28	40	26.73	. .	16.45				
			41	41.98	41	58.40	. .	16.42				
			43	0.68	43	17.15	. .	16.47				
			44	18.35	44	34.80	. .	16.45				
			45	34.30	45	50.75	. .	16.45				
			46	55.34	47	11.80	. .	16.46				
			48	16.20	48	32.60	. .	16.40				
			51	9.65	51	26.10	. .	16.45				
			52	29.14	52	45.62	. .	16.48				
			53	53.38	54	9.85	. .	16.47				
			55	18.91	55	35.50	. .	+16.59				
	Mean	. .	. . .	. .	. . .	. .	. .	+16.464				
			h. m.	$67^{r}.047$	$68^{r}.559$							
			9 55	.028	.633							
				66.970	.605							
	Mean	. .	. .	67.015	68.599							
30	JAPETUS . . .	270	20 53 35.54	39.87	20 53 5.87	10.20	−29.67	−29.67	3 A	4	H.	JAPETUS south, preceding SATURN.
			55 5.00	9.34	54 35.38	39.73	29.62	29.61				Chron. corr., $+0^{m}.2$.
			56 30.71	35.10	56 1.10	5.48	29.61	29.62				
			21 1 45.04	49.37	21 1 15.43	19.85	29.61	29.52				
			3 20.79	25.16	2 51.05	55.45	29.74	29.71				
			5 23.24	27.60	4 53.65	58.00	29.59	29.60				
			10 21.18	25.62	9 51.60	56.00	29.58	29.62				
			10 49.89	54.24	10 20.30	24.63	29.59	29.61				
			13 25.30	29.60	12 55.60	59.95	29.70	29.65				
			15 0.71	5.10	14 31.10	35.50	−29.61	−29.60				
	Mean	. .	. . .	. .	. . .	. .	−29.632	−29.621				
				$60^{r}.862$	$62^{r}.146$							
			h. m.	.850	.071							
			8 51	.780	.050							
				.690	61.960							
				.789	.990							
	Mean	. .	. .	60.794	62.043							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δ a		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
1875. Sept. 30	Titan	110	20 53 35.54	39.87	20 53 44.90	49.30	+ 9.36	+ 9.43	3 A	3	H.	Titan south, following Saturn. Chron. corr., + $0^{m}.2$.
			55 5.00	9.34	55 14.43	18.80	9.43	9.46				
			56 30.71	35.10	56 40.20	44.50	9.49	9.40				
			21 1 45.04	49.37	21 1 54.53	58.90	9.49	9.53				
			3 20.79	25.16	3 30.28	34.55	9.49	9.39				
			5 23.24	27.60	5 32.70	37.00	9.46	9.40				
			10 21.18	25.62	9 30.60	35.05	9.42	9.43				
			10 49.89	54.24	10 59.30	3.75	9.41	9.51				
			13 25.30	29.60	13 34.70	39.15	9.40	9.55				
			15 0.71	5.10	15 10.05	14.55	+ 9.34	+ 9.45				
	Mean	. .	. . .	. .	. . .	. .	+ 9.429	+ 9.455				
				$60^{r}.500$	$65^{r}.173$							
			h. m.	.402	.123							
			9 7	.403	.091							
				.472	.091							
				.375	.160							
	Mean	. .	. .	60.430	65.127							
	Hyperion . .	100	20 53 35.54	39.87	20 53 51.33	55.78	+15.79	+15.91	3 A	3	H.	Hyperion south, following Saturn. Chron. corr., + $0^{m}.2$. Parallel (Ver. I) by Titan = 2°.3.
			55 5.00	9.34	55 20.80	25.30	15.80	15.96				
			56 30.71	35.10	56 46.55	51.00	15.84	15.90				
			21 1 45.04	49.37	21 2 1.00	5.35	15.96	15.98				
			3 20.79	25.16	3 36.62	41.17	15.83	16.01				
			5 23.24	27.60	5 39.25	43.53	16.01	15.93				
			10 21.18	25.62	10 37.00	41.60	15.82	15.98				
			10 49.89	54.24	11 5.85	10.20	15.96	15.96				
			13 25.30	29.60	13 41.25	45.67	15.95	16.07				
			15 0.71	5.10	15 16.63	21.00	+15.92	+15.90				
	Mean	. .	. . .	. .	. . .	. .	+15.888	+15.960				
				$59^{r}.450$	$62^{r}.581$							
			h. m.	.404	.480							
			9 18	.360	.518							
				.407	.517							
				.367	.490							
	Mean	. .	. .	59.397	62.517							
Oct. 2	Japetus . . .	110	20 19 26.20	29.90	20 18 53.30	57.15	−32.90	−32.75	3 A	3	H.	Japetus south, preceding Saturn. Chron. corr., $0^{m}.0$.
			20 55.14	59.02	20 22.55	26.28	32.59	32.74				
			22 7.05	10.73	21 34.30	37.90	32.75	32.83				
			23 20.48	24.20	22 47.70	51.45	32.78	32.75				
			25 43.05	46.81	25 10.35	14.00	32.70	32.81				
			26 46.10	49.80	26 13.27	17.00	32.83	32.80				
			28 11.86	15.58	27 39.00	42.85	32.86	32.73				
			29 25.40	29.17	28 52.73	56.38	32.67	32.79				
			30 54.85	58.61	30 22.05	25.78	32.80	32.83				
			32 11.08	14.70	31 38.28	42.00	−32.80	−32.70				
	Mean	. .	. . .	. .	. . .	. .	−32.768	−32.773				
				$63^{r}.938$	$64^{r}.887$							
			h. m.	.998	.861							
			8 0	64.018	.990							
				.060	.967							
				.056	65.042							
	Mean	. .		64.014	64.949							
5	Japetus . . .	270	20 7 1.05	5.70	20 6 25.00	29.67	−36.05	−36.03	3 A	3	H.	Japetus south, preceding Saturn. Chron. corr., + $0^{m}.3$.
			8 23.30	28.02	7 47.40	51.93	35.90	36.09				
			9 32.58	37.23	8 56.67	1.32	35.91	35.91				
			10 49.34	53.93	10 13.30	17.95	36.04	35.98				
			11 57.82	2.56	11 21.80	26.55	36.02	36.01				
			15 6.65	11.27	14 30.68	35.40	35.97	35.87				
			16 38.13	42.74	16 2.05	6.70	36.08	36.04				
			17 52.11	56.86	17 16.05	20.65	36.06	36.21				
			19 28.90	33.50	18 52.77	57.40	36.13	36.10				
			20 49.15	53.80	20 13.15	17.80	36.00	36.00				
			22 5.06	9.72	21 29.00	33.75	36.06	35.97				
			23 17.83	22.53	22 41.83	46.40	36.00	36.13				
			26 0.59	5.22	25 24.47	29.20	36.12	36.02				
			27 19.87	24.52	26 43.90	48.40	35.97	36.12				
			28 20.36	25.00	27 44.30	48.97	−36.06	−36.03				
	Mean	. .	. . .	. . .	. . .	. .	−36.025	−36.034				

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δ α		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°										
Oct. 5	Japetus . . .	. .	. .	65^{r}.350	65^{r}.855							
			h. m.	.385	.865							
			7 2	.416	.855							
				.348	.810							
				.398	.866							
	Mean	. .		65.379	65.850							
			h. m. s.	s.	h. m. s.	s.	s.	s.				
	Titan . . .	270	20 7 1.05	5.70	20 6 50.10	54.68	−10.95	−11.02	3 A	3	H.	Titan south, preceding Saturn.
			8 23.30	28.02	8 12.33	16.95	10.97	11.07				Chron. corr., + 0^{m}.3.
			9 32.58	37.23	9 21.57	26.28	11.01	10.95				
			10 49.34	53.93	10 38.25	42.88	11.09	11.05				
			11 57.82	2.56	11 46.85	51.42	10.97	11.14				
			15 6.65	11.27	14 55.58	0.20	11.07	11.07				
			16 38.13	42.74	16 27.00	31.60	11.13	11.14				
			17 52.11	56.86	17 40.96	45.55	11.15	11.31				
			19 28.90	33.50	19 17.60	22.30	11.30	11.20				
			20 49.15	53.80	20 38.00	42.67	11.15	11.13				
			22 5.06	9.72	21 53.87	58.58	11.19	11.14				
			23 17.83	22.53	23 6.70	11.40	11.13	11.13				
			26 0.59	5.22	25 49.30	54.00	11.29	11.22				
			27 19.87	24.52	27 8.70	13.38	11.17	11.14				
			28 20.36	25.00	28 9.23	13.83	−11.13	−11.17				
	Mean	. .	. . .	. .	. . .	. .	−11.113	−11.125				
				65^{r}.494	65^{r}.670							
			h. m.	.460	.641							
			8 2	.390	.601							
				.372	.638							
				.351	.585							
	Mean	. .	. .	65.413	65.627							
7	Japetus . . .	270	20 37 52.68	57.40	20 37 15.57	20.38	−37.11	−37.02	3 A	2	H.	Japetus south, preceding Saturn.
			39 10.00	14.67	38 32.93	37.52	37.07	37.15				Chron. corr., + 0^{m}.4.
			40 28.13	32.81	39 51.00	55.65	37.13	37.16				
			42 1.70	6.36	41 24.45	29.17	37.25	37.19				
			43 11.70	16.43	42 34.76	39.32	36.94	37.11				
			44 25.52	30.25	43 48.38	53.00	37.14	37.25				
			46 50.73	55.48	46 13.67	18.37	37.06	37.11				
			48 21.62	26.37	47 44.65	49.23	36.97	37.14				
			49 29.84	34.66	48 52.73	57.40	37.11	37.26				
			50 48.44	53.12	50 11.23	16.00	37.21	37.12				
			52 8.26	13.02	51 31.27	35.93	36.99	37.09				
			53 27.04	31.71	52 49.95	54.73	37.09	36.98				
			54 49.27	53.98	54 12.25	16.87	37.02	37.11				
			22 13 32.30	37.33	22 12 55.20	0.13	37.10	37.20				
			15 5.49	10.46	14 28.30	33.27	37.19	37.19				
			16 32.23	37.14	15 55.00	0.00	37.23	37.14				
			17 44.99	49.95	17 07.77	12.80	37.22	37.15				
			18 53.26	58.26	18 16.00	21.00	−37.26	−37.26				
	Mean	. .	. . .	. .	. . .	. .	−37.116	−37.146				
				65^{r}.398	65^{r}.522							
			h. m.	.348	.492							
			8 0	.383	.490							
				.346	.499							
				.350	.473							
	Mean	. .	. .	65.365	65.495							
	Titan	280	20 37 52.68	57.40	20 37 41.30	46.00	−11.38	−11.40	3 A	2	H.	Titan north, preceding Saturn.
			39 10.00	14.67	38 58.60	3.43	11.40	11.24				Chron. corr., + 0^{m}.4.
			40 28.13	32.81	40 16.77	21.50	11.36	11.31				
			42 1.70	6.36	41 50.37	55.00	11.33	11.36				
			43 11.70	16.43	43 0.30	5.05	11.40	11.38				
			44 25.52	30.25	44 14.13	18.80	−11.39	−11.45				
	Mean	. .	. . .	. .	. . .	. .	−11.377	−11.357				
				65^{r}.146	61^{r}.877							
			h. m.	.120	.841							
			8 10	.202	.875							
				.184	.960							
				.260	.968							
	Mean	. .	. .	65.182	61.904							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δ a		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
Oct. 7	HYPERION . .	265	20 46 50.73	55.48	20 46 40.00	44.67	−10.73	−10.81	3 A	2	H.	HYPERION south, preceding SATURN. Chron. corr., + $0^{m}.4$. Images bad, and HYPERION difficult to observe.
			48 21.62	26.37	48 10.92	15.50	10.70	10.87				
			49 29.84	34.66	49 19.20	23.86	10.64	10.80				
			50 48.44	53.12	50 37.75	42.36	10.69	10.76				
			52 8.26	13.02	51 57.68	2.45	10.58	10.57				
			53 27.04	31.71	53 16.35	21.00	10.69	10.71				
			54 49.27	53.98	54 38.73	43.28	10.54	10.70				
			22 13 32.30	37.33	13 21.65	26.40	10.65	10.93				
			15 5.49	10.47	14 54.35	59.53	11.11	10.93				
			16 32.23	37.14	16 21.35	26.30	10.88	10.84				
			17 44.99	49.95	17 34.00	39.00	10.99	10.95				
			18 53.26	58.26	18 42.30	47.30	−10.96	10.96				
	Mean	. .	. . .	. .	. . .	. .	−10.764	−10.819				
				$70^{r}.101$	$71^{r}.630$							
			h. m.	.280	.860							
			8 21	.254	.770							
				.145	.724							
				.093	.750							
	Mean	. .	.	70.175	71.747							
9	JAPETUS . . .	. .	19 54 22.30	26.25	19 53 44.97	48.85	−37.33	−37.40	3 A	3	H.	JAPETUS north, preceding SATURN. Chron. corr., $0^{m}.0$. Clouded up. HYPERION visible for a few minutes.
			55 35.28	39.13	54 57.80	1.75	37.48	37.38				
			56 50.99	54.96	56 13.67	17.57	37.32	37.39				
			58 50.34	54.21	58 13.00	16.90	37.34	37.31				
			20 0 0.55	4.39	59 23.05	27.00	37.50	37.39				
			1 26.66	30.64	20 0 49.37	53.25	37.29	37.39				
			2 47.92	51.90	2 10.60	14.45	37.32	37.45				
			4 58.40	2.28	4 21.00	24.85	37.40	37.43				
			7 8.06	11.96	6 30.73	34.62	37.33	37.34				
			8 28.35	32.31	7 51.00	54.95	37.35	37.36				
			9 50.24	54.22	9 12.85	16.80	37.39	37.42				
			10 53.39	57.29	10 16.13	20.00	37.26	37.29				
			12 19.16	23.08	11 41.75	45.70	37.41	37.38				
			14 36.14	40.00	13 58.77	2.65	−37.37	−37.35				
	Mean	. .	. . .	. .	. . .	. .	−37.364	−37.377				
			h. m.	$67^{r}.413$	$67^{r}.140$	. .	. .	. .	.	.	.	Haze; half weight to this comparison.
			7 6	.396	.126							
	Mean	. .	. . .	67.404	67.133							
			h. m.	$67^{r}.521$	$67^{r}.385$							
			7 24	.532	.353							
				.540	.351							
	Mean	. .	. . .	67.531	67.363							
12	JAPETUS . . .	270	20 25 18.33	22.70	20 24 42.30	46.70	−36.03	−36.00	3 A	2	H.	JAPETUS north, preceding SATURN. Chron. corr., +$0^{m}.6$.
			26 43.37	47.80	26 7.37	11.80	36.00	36.00				
			28 33.19	37.61	27 57.20	1.60	35.99	36.01				
			29 57.62	2.05	29 21.57	26.00	36.05	36.05				
			31 26.51	30.97	30 50.50	54.95	36.01	36.02				
			33 5.48	9.87	32 29.50	33.90	35.98	35.97				
			34 18.35	22.84	33 42.37	46.88	35.98	35.96				
			36 33.97	38.38	35 57.90	2.40	36.07	35.98				
			38 5.21	9.70	37 29.20	33.70	36.01	36.00				
			39 24.26	28.70	38 48.36	52.85	−35.90	−35.95				
	Mean	. .	. . .	. .	. . .	. .	−36.002	−35.994				
				$61^{r}.760$	$61^{r}.093$							
			h. m.	.740	.099							
			7 25	.729	.078							
				.782	.010							
				.725	.015							
	Mean	. .	. . .	61.747	61.059							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		△a		Eye-piece.	Image.	Observer.	Remarks.
			Wire. I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
Oct. 12	TITAN	80	20 25 18.33	22.70	20 25 27.60	32.10	+ 9.27	+ 9.40	3 A	2	H.	TITAN north, following SATURN. Chron. corr., + $0^m.6$. Images shaky and bad. HYPERION just visible in about $p = 290°$.
			26 43.37	47.80	26 52.68	57.10	9.31	9.30				
			28 33.19	37.61	28 42.48	46.90	9.29	9.29				
			29 57.62	2.05	30 6.95	11.37	9.33	9.32				
			31 26.51	30.97	31 35.90	40.35	9.39	9.38				
			33 5.48	9.87	33 14.76	19.10	9.28	9.33				
			34 18.35	22.84	34 27.67	32.05	9.32	9.21				
			36 33.97	38 38	36 43.30	47.75	9.33	9.37				
			38 5.21	9.70	38 14.63	19.00	9.41	9.30				
			39 24.26	28.70	39 33.65	38.15	+ 9.39	+ 9.45				
	Mean	. .	. . .	. .	. . .	. .	+ 9.332	+ 9.335				
				60^r.099	61^r.715							
				.070	.690							
			h. m.	59.990	.590							
			7 33	60.076	.755							
				.098	.745							
	Mean	. .	. . .	60.067	61.699							
13	JAPETUS . . .	. .	21 18 51.55	56.68	21 18 16.63	21.68	−34.92	−35.00	3 A	2	H.	JAPETUS north, preceding SATURN. Chron. corr., + $0^m.7$. Observed through haze.
			20 16.25	21.36	19 41.18	46.36	35.07	35.00				
			24 7.57	12.66	23 32.55	37.63	35.02	35.03				
			25 28.24	33.30	24 53.20	58.20	35.04	35.10				
			26 48.98	54.06	26 14.00	19.00	34.98	35.06				
			28 15.79	20.86	27 40.72	45.83	35.07	35.03				
			33 22.81	27.91	32 47.73	52.92	35.08	34.99				
			34 44.39	49.46	34 9.42	14.48	34.97	34.98				
			36 18.35	23.36	35 43.36	48.40	34.99	34.96				
			37 36.19	41.16	37 1.22	6.26	34.97	34.90				
			39 9.16	14.24	38 34.10	39.23	−35.06	−35.01				
	Mean	. .	. . .	. .	. . .	. .	−35.015	−35.005				
				59^r.336	58^r.510							
			h. m.	.343	.462							
			8 21	.316	.468							
				.324	.450							
				.273	.444							
	Mean	. .	. .	59.318	58.467							
13	TITAN	. .	21 18 51.55	56.68	21 19 3.63	8.72	+12.08	+12.04	3 A	2	H.	TITAN south, following SATURN. Chron. corr., + $0^m.7$. Seen through haze.
			20 16.25	21.36	20 28.32	33.28	12.07	11.92				
			24 7.57	12.66	24 19.57	24.63	12.00	11.97				
			25 28.24	33.30	25 40.20	45.27	11.96	11.97				
			26 48.98	54.06	27 0.93	6.00	11.95	11.94				
			28 15.79	20.86	28 27.77	32.85	11.98	11.99				
			33 22.81	27.91	33 34.77	39.90	11.96	11.99				
			34 44.39	49.46	34 56.47	1.53	12.08	12.07				
			36 18.35	23.36	36 30.35	35.38	12.00	12.02				
			37 36.19	41.16	37 48.10	53.25	11.91	12.09				
			39 9.16	14.24	39 21.10	26.33	+11.94	+12.09				
	Mean	. .	. . .	. .	. . .	. .	+11.994	+12.008				
				58^r.990	59^r.332							
				59.068	.429							
			h. m.	.143	.431							
			8 32	.017	.388							
				.003	.366							
	Mean	. .	. . .	59.044	59.389							
17	JAPETUS . . .	270	20 16 35.68	40.81	20 16 6.25	11.47	−29.43	−29.34	3 A	3	H.	JAPETUS north, preceding SATURN. Chron. corr., + $0^s.9$.
			19 15.20	20.39	18 45.75	50.93	29.45	29.46				
			20 12.02	17.31	19 42.70	47.85	29.32	29.46				
			21	49.03	21 14.36	19.57	. .	29.46				
			23 17.68	22.85	22 48.20	53.40	29.48	29.45				
			24 30.93	36.02	24 1.45	6.62	29.48	29.40				
			25 53.14	. .	25 23.70	28.80	29.44	. .				
			28 12.78	17.94	. . .	. .	. .	. .				
			30 6.74	11.91	29 37.33	42.47	29.41	29.44				
			31 19.89	25.05	30 50.35	55.60	29.54	29.45				
			32 29.65	34.71	32 0.15	5.25	−29.50	−29.46				
	Mean	. .	. . .	. .	. . .	. .	−29.450	−29.436				

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		△ α		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°										
Oct. 17	JAPETUS . . .	. .		$73^{\mathrm{r}}.845$	$72^{\mathrm{r}}.514$							
				.908	.516							
			h. m.	.958	.520							
			6 55	.919	.519							
				.890	.530							
	Mean	. .	. . .	73.904	72.520							
17			h. m. s.	s.	h. m. s.	s.	s.	s.				
	HYPERION . .	85	20 16 35.68	40.81	20 16	50.70	. .	+ 9.89	3 A	2	H.	HYPERION north, following SATURN. Chron. corr., + $0^{\mathrm{m}}.9$. HYPERION faint and difficult.
			19 15.20	20.39	19 25.25	30.27	+10.05	9.88				
			20 12.02	17.31	20 22.00	27.23	9.98	9.92				
			21	49.03	21 53.63	58.87	. .	9.84				
			23 17.68	22.85	23	32.68	. .	9.83				
			24 30.93	36.02	24 40.63	45.77	9.70	9.75				
			25 53.14	. .	26 2.90	8.00	9.76	. .				
			28 12.78	17.94	28 22.50	27.80	9.72	9.86				
			30 6.74	11.91	30 16.38	21.68	9.64	9.77				
			31 19.89	25.05	31 29.52	34.70	9.63	9.65				
			32 29.65	34.71	32 39.47	44.33	+ 9.82	+ 9.62				
	Mean	. .	. . .	. .	. . .	. .	+ 9.788	+ 9.801				
				$73^{\mathrm{r}}.895$	$70^{\mathrm{r}}.296$							
				.975	.484							
			h. m.	.024	.424							
			7 4	.938	.462							
				.977	.428							
	Mean	. .	. .	73.962	70.419							
19	JAPETUS . . .	273	20 48 39.03	44.40	20 48 13.60	19.00	−25.43	−25.40	3 A	2	H.	JAPETUS north, preceding SATURN. Chron. corr., + $0^{\mathrm{m}}.6$. Seen through clouds.
			50 0.07	5.47	49 34.70	40.20	25.37	25.27				
			51 36.41	41.88	51 11.00	16.37	25.41	25.51				
			52 55.89	1.33	52 30.50	36.00	25.39	25.33				
			56 25.26	30.65	55 59.97	5.36	25.29	25.29				
			58 47.32	52.70	58 21.93	27.30	25.39	25.40				
			21 0 35.15	40.50	0 9.73	15.10	25.42	25.40				
			1 51.75	57.14	1 26.47	31.90	25.28	25.24				
			3 7.23	12.56	2 41.80	47.05	−25.43	−25.51				
	Mean	. .	. . .	. .	. . .	. .	−25.379	−25.372				
			h. m.									
			7 23	$66^{\mathrm{r}}.880$	$65^{\mathrm{r}}.300$							
			7 32	68.466	66.795							
			7 34	68.416	66.790							
	Mean	. .	. .	67.921	66.295							
	HYPERION . .	90	20 48 39.03	44.40	20 48 53.73	59.25	+14.70	+14.85	3 A	1	H.	HYPERION north, following SATURN. Chron. corr., + $0^{\mathrm{m}}.6$. Cloudy, and satellite faint and most of the time invisible.
			58 47.32	52.70	59 2.25	7.58	14.93	14.88				
			21 1 51.75	57.14	21 2 6.50	12.00	+14.75	+14.86				
	Mean	. .	. . .	. .	. . .	. .	+14.793	+14.863				
				$68^{\mathrm{r}}.519$	$67^{\mathrm{r}}.714$							
			h. m.	.383	.781							
			7 40	.376	.831							
	Mean	. .	. .	68.426	67.775							
21	JAPETUS . . .	275	20 56 0.86	5.78	20 55 39.95	44.90	−20.91	−20.88	3 A	2	H.	JAPETUS north, preceding SATURN. Chron. corr., $0^{\mathrm{m}}.0$.
			57 5.83	10.63	56 44.78	49.85	21.05	20.78				
			58 25.76	30.64	58 4.92	9.87	20.84	20.77				
			59 46.70	51.60	59 25.87	30.80	20.83	20.80				
			21 1 19.62	24.62	21 0 58.80	3.65	20.82	20.95				
			2 34.14	19.08	2 13.32	18.25	20.81	20.83				
			3 42.83	47.65	3 21.90	26.90	20.92	20.75				
			5 9.50	14.27	4 48.67	53.42	20.83	20.85				
			6 25.52	30.36	6 4.58	9.43	20.94	20.93				
			7 47.19	52.12	7 26.33	31.22	20.86	20.90				
			8 54.73	59.78	8 33.93	38.97	20.80	20.81				
			10 0.33	5.20	9 39.50	44.42	20.83	20.78				
			11 22.87	27.70	11 2.00	6.90	20.87	20.80				
			12 52.56	57.53	12 31.80	36.58	20.76	20.95				
			14 20.46	25.41	13 59.65	4.53	−20.76	−20.88				
	Mean	. .	. . .	. .	. . .	. .	−20.855	−20.844				

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δa		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°										
Oct. 21	Japetus . . .	. .		$58^{r}.139$	$56^{r}.248$							
			h. m.	.030	.275							
			7 29	.109	.230							
				57.976	.163							
				.940	.210							
	Mean	. .	. .	58.039	56.225							
			h. m. s.	s.	h. m. s.	s.	s.	s.				
	Titan . . .	90	20 56 0.86	5.78	20 55 50.00	54.86	−10.86	−10.92	3 A	2	H.	Titan south, preceding Saturn.
			57 5.83	10.63	56 54.90	59.85	10.93	10.78				Chron. corr., $0^{m}.0$.
			58 25.76	30.64	58 14.90	19.70	10.86	10.94				
			59 46.70	51.60	59 35.85	40.72	10.85	10.88				
			21 1 19.62	24.62	21 1 8.63	13.65	10.99	10.95				
			2 34.14	19.08	2 23.25	28.15	10.89	10.93				
			3 42.83	47.65	3 31.85	36.80	10.98	10.85				
			5 9.50	14.27	4 58.50	3.30	11.00	10.97				
			6 25.52	30.36	6 14.48	19.45	11.04	10.91				
			7 47.19	52.12	7 36.23	41.00	10.96	11.12				
			8 54.73	59.78	8 43.77	48.65	10.96	11.13				
			10 0.33	5.20	9 49.40	54.26	10.93	10.94				
			11 22.87	27.70	11 11.73	16.67	11.14	11.03				
			12 52.56	57.53	12 41.70	46.50	10.86	11.03				
			14 20.46	25.41	14 9.43	14.37	−11.03	−11.04				
	Mean	. .	. . .	. .	. . .	. .	−10.952	−10.961				
				$57^{r}.981$	$58^{r}.151$							
			h. m.	.944	.038							
			7 39	.010	.084							
				.882	.078							
				.884	.995							
	Mean	. .	. .	57.940	58.069							
	Hyperion . .	97	20 57 5.83	0.86	20 57 21.75	26.95	+15.92	+16.32	3 A	2	H.	Hyperion south, following Saturn.
			58 25.76	30.64	58 41.60	46.75	15.84	16.11				Excessively faint.
			59 46.70	51.60	21 0 2.75	7.68	16.05	16.08				Chron. corr., $0^{m}.0$.
			21 1 19.62	24.62	1 35.57	40.65	15.95	16.05				
			5 9.50	14.27	5 25.30	. .	15.80	. .				
			10 0.33	5.20	10 16.40	21.40	16.07	16.20				
			11 22.87	27.70	11 38.60	43.90	15.73	16.20				
			12 52.56	57.53	13 8.45	13.30	15.89	15.77				
			14 20.46	25.41	14 36.40	41.23	+15.94	+15.82				
	Mean	. .	. . .	. .	. . .	. .	+15.910	+16.069				
			h. m.	$57^{r}.870$	$60^{r}.354$							
			7 48	.860	.295							
				.675	.109							
	Mean	. .	. .	57.802	60.253							
22	Japetus . . .	275	20 37 14.32	18.89	20 36 55.88	0.50	−18.44	−18.39	3A	4	H.	Japetus north, preceding Saturn.
			38 12.24	16.69	37 53.80	58.37	18.44	18.32				Chron. corr., + $0^{m}.5$.
			39 28.87	33.25	39 10.32	14.80	18.55	18.45				
			40 51.56	56.00	40 33.15	37.53	18.41	18.47				
			41 51.15	55.58	41 32.60	37.18	18.55	18.40				
			43 19.33	23.78	43 0.90	5.30	18.43	18.48				
			44 54.58	58.99	44 36.15	40.55	18.43	18.44				
			46 2.56	6.96	45 44.20	48.60	18.36	18.36				
			47 12.99	17.48	46 54.63	59.00	18.36	18.48				
			48 13.56	17.95	47 55.13	59.44	18.43	18.51				
			49 15.30	19.69	48 56.90	1.30	18.40	18.39				
			50 32.94	37.35	50 14.56	18.95	−18.38	−18.40				
	Mean	. .	. . .	. .	. . .	. .	−18.432	−18.424				
				$61^{r}.601$	$59^{r}.744$							
			h. m.	.631	.702							
			7 12	.640	.718							
				.627	.761							
				.638	.793							
	Mean	. .	. .	61.627	59.744							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δ α		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
Oct. 22	TITAN	275	20 37 14.32	18.89	20 37 2.30	6.97	−12.02	−11.92	3A	4	H.	TITAN north, preceding SATURN.
			38 12.24	16.69	38 0.35	4.77	11.89	11.92				Chron. corr., +0^{m}.5.
			39 28.87	33.25	39 16.83	21.15	12.04	12.10				
			40 51.56	56.00	40 39.55	43.98	12.01	12.02				
			41 51.15	55.58	41 39.13	43.50	12.02	12.08				
			43 19.33	23.78	43 7.30	11.70	12.03	12.08				
			44 54.58	58.99	44 42.60	46.95	11.98	12.04				
			46 2.56	6.96	45 50.52	55.00	12.04	11.96				
			47 12.99	17.48	47 1.00	5.46	11.99	12.02				
			48 13.56	17.95	48 1.50	6.00	12.06	11.95				
			49 15.30	19.69	49 3.35	7.68	11.95	12.01				
			50 32.94	37.35	50 20.98	25.40	−11.96	−11.95				
	Mean	. .	. . .	. .	. . .	. .	−11.990	−12.004				
				59^{r}.800	61^{r}.514							
			h. m.	.834	.490							
			7 19	.790	.495							
				.770	.520							
				.785	.521							
	Mean	. .	. .	59.796	61.508							
	JAPETUS . . .	. .	20 56 9.51	13.93	20 55 51.10	55.55	−18.41	−18.38	3 A	4	Todd	
			56 48.04	52.43	56 29.68	34.00	18.36	18.43				
			57 26.03	30.54	57 7.67	12.15	18.36	18.39				
			58 32.08	36.38	58 13.64	17.98	18.44	18.40				
			59 34.54	38.92	59 16.12	20.53	18.42	18.39				
			21 0 20.58	24.90	21 0 2.20	6.50	18.38	18.40				
			1 53.92	58.30	1 35.48	39.93	18.44	18.37				
			2 34.26	38.61	2 15.92	20.26	18.34	18.35				
			4 24.75	29.09	4 6.38	10.80	18.37	18.29				
			5 12.89	17.26	4 54.50	59.00	18.39	18.26				
			6 17.89	22.32	5 59.48	4.00	18.41	18.32				
			7 5.85	10.35	6 47.50	51.92	−18.35	−18.43				
	Mean	. .	. . .	. .	. . .	. .	−18.389	−18.368				
	TITAN	. .	20 56 9.51	13.93	20 55 57.63	1.85	−11.88	−12.08	3 A	4	Todd	
			56 48.04	52.43	56 36.10	40.55	11.94	11.88				
			57 26.03	30.54	57 14.10	18.60	11.93	11.94				
			58 32.08	36.38	58 20.13	24.48	11.95	11.90				
			59 34.54	38.92	59 22.58	26.90	11.96	12.02				
			0 20.58	24.90	21 0 8.50	13.00	12.08	11.90				
			1 53.92	58.30	1 41.80	46.27	12.12	12.03				
			2 34.26	38.61	2 22.35	26.77	11.91	11.84				
			4 24.75	29.09	4 12.75	17.15	12.00	11.94				
			5 12.89	17.26	5 0.90	5.30	11.99	11.96				
			6 17.89	22.32	6 5.90	10.36	11.99	11.96				
			7 5.85	10.35	6 53.80	58.32	−12.05	−12.03				
	Mean	. .	. . .	. .	. . .		−11.983	−11.957				
Nov. 5	JAPETUS . . .	85	21 30 17.08	21.97	21 30 36.93	41.70	+19.85	+19.73	3 A	3	H.	JAPETUS north, following SATURN.
			31 18 94	23.81	31 38.76	43.53	19.82	19.72				Chron. corr., +0^{m}.5.
			32 30.04	34.93	32 49.77	54.65	19.73	19.72				
			33 43.85	48.62	34 3.60	8.48	19.75	19.86				
			35 13.76	18.58	35 33.50	38.42	19.74	19.84				
			36 29 35	34.21	36 49.18	54.00	19.83	19.79				
			37 52.09	56.95	38 11.95	16.80	19.86	19.85				
			39 4.01	8.84	39 23.83	28.63	19.82	19.79				
			40 33.33	38.17	40 53.00	57.96	19.67	19.79				
			41 45.95	50.69	42 5.65	10.48	19.70	19.79				
			44 8.05	12.90	44 27.80	32.70	19.75	19.80				
			45 23.38	28.20	45 43.16	47.97	19.78	19.77				
			46 30.14	35.07	46 49.88	54.80	19.74	19.73				
			47 50.65	55.50	48 10.47	15.32	+19.82	+19.82				
	Mean	. .	. . .	. .	. . .	. .	+19.776	+19.786				
				68^{r}.235	66^{r}.708							
			h. m.	.065	.546							
			7 0	.061	.574							
				.032	.476							
				.020	.457							
	Mean	. .	. . .	68.083	66.552							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δα		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
1875. Nov. 6	JAPETUS . . .	86	21 52 34.01	38.33	21 52 56.20	0.56	+22.19	+22.23	3 A	3	H.	JAPETUS north, following SATURN.
			53 47.38	51.80	54 9.48	13.85	22.10	22.05				Chron. corr., + $0^{m}.5$.
			55 13.40	17.82	55 35.50	39.87	22.10	22.05				
			56 32.35	36.72	56 54.48	58.85	22.13	22.13				
			57 58.22	2.53	58 20.25	24.62	22.03	22.09				
			59 47.69	52.10	22 0 9.80	14.27	22.11	22.17				
			22 1 24.57	28.91	1 46.60	50.92	22.03	22.01				
			2 45.14	49.56	3 7.28	11.63	22.14	22.07				
			3 58.91	3.34	4 21.00	25.40	22.09	22.06				
			5 3.45	7.86	5 25.50	30.00	22.05	22.14				
			6 33.05	37.54	6 55.25	59.66	22.20	22.12				
			8 2.08	6.50	6 24.15	28.15	22.07	22.08				
			9 16.00	20.38	6	. .	. .	. .				
			10 15.62	20.00	10 37.65	42.15	22.03	22.15				
			11 35.39	39.80	11 57.50	1.92	+22.11	+22.12				
	Mean	. .	. . .	. .	. . .	. .	+22.099	+22.105				
				$68^{r}.246$	$66^{r}.872$							
				.074	.681							
			h. m.	.945	.517							
			7 20	.904	.522							
				.760	.430							
	Mean	. .	. . .	67.986	66.604							
8	TITAN	280	21 9 27.81	32.08	21 9 17.00	21.33	−10.81	−10.75	3 A	3	H.	TITAN north, preceding SATURN.
			10 43.86	48.23	10 33.05	37.30	10.81	10.93				Chron. corr., + $0^{m}.6$.
			12 5.37	9.58	11 54.57	58.80	10.80	10.78				
			13 27.82	32.13	13 17.00	21.35	10.82	10.78				
			14 46.15	50.45	14 35.37	39.63	10.78	10.82				
			17 7.96	12.14	16 57.05	1.40	10.91	10.74				
			18 37.32	41.61	18 26.53	30.87	10.77	10.74				
			19 49.54	53.68	19 38.70	42.92	10.84	10.76				
			21 24.12	28.33	21 13.30	17.63	10.82	10.70				
			22 39.86	44.23	22 29.00	33.40	10.86	10.83				
			23 49.08	53.39	23 38.37	42.60	10.71	10.79				
			25 3.14	7.42	24 52.37	56.73	10.77	10.69				
			28 8.65	12.89	27 57.80	2.20	10.85	10.69				
			29 28.55	32.79	29 17.73	22.15	10.82	10.64				
			31 3.00	7.30	30 52.15	56.62	10.85	10.68				
			32 39.68	43.99	32 29.00	33.32	10.68	10.67				
			34 52.61	56.90	34 41.80	46.18	10.81	10.72				
			36 29.79	34.13	36 19.00	23.42	10.79	10.71				
			37 57.78	2.06	37 47.00	51.36	10.78	10.70				
			39 22.45	26.74	39 11.73	16.00	10.72	10.74				
			40 43.66	47.96	40 33.00	37.20	−10.66	−10.76				
	Mean	. .	. . .	. .	. . .	. .	−10.798	−10.744				
				$58^{r}.812$	$62^{r}.037$							
				.788	61.983							
			h. m.	.660	.891							
			6 41	.700	.860							
				.671	.916							
	Mean	. .	. . .	58.726	61.937							
11	JAPETUS . . .	90	21 48 55.65	0.61	21 49 26.30	31.25	+30.65	+30.65	3 A	3	H.	JAPETUS north, following SATURN.
			50 49.28	54.23	51 20.00	25.00	30.77	30.72				Chron. corr., + $0^{m}.7$.
			52 33.67	38.59	53 4.35	9.32	30.73	30.68				At first image of SATURN bad, but better after the first five transits.
			54 3.02	7.97	54 33.68	38.70	30.73	30.66				
			35 32.58	37.56	56 3.25	8.23	30.67	30.67				
			57 29.02	33.95	57 59.57	4.65	30.70	30.55				
			58 58.56	3.46	59 29.30	34.25	30.79	30.74				
			22 0 45.62	50.59	22 1 16.38	21.30	30.71	30.76				
			2 49.82	54.80	3 20.50	25.40	30.68	30.60				
			4 32.42	37.35	5 3.00	8.00	30.65	30.58				
			7 16.63	21.53	7 47.20	52.23	30.70	30.57				
			9 34.14	39.10	10 4.83	9.77	30.69	30.67				
			11 17.62	22.52	11 48.12	53.15	+30.50	+30.63				
	Mean	. .	. . .	. .	. . .	. .	+30.690	+30.652				

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δ a		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
		°										
1875. Nov. 11	JAPETUS . . .	. .		59$^{\text{r}}$.695	60$^{\text{r}}$.427							
				.661	.408							
			h. m.	.481	.250							
			7 3	.472	.186							
				.350	.062							
	Mean	. .	. . .	59.532	60.267							
			h. m. s.	s.	h. m. s.	s.	s.	s.				
12	JAPETUS . . .	90	21 21 34.38	39.28	21 22 6.23	11.00	+31.85	+31.72	3 A	4	H.	JAPETUS north, following SATURN. Chron. corr., + 0$^{\text{m}}$.7. Parallel, 169°.5,
			23 14.48	19.29	23 46.27	51.00	31.79	31.71				
			24 48.36	53.21	25 20.00	25.00	31.64	31.79				
			26 22.76	27.66	26 54.54	59.47	31.78	31.81				
			28 5.43	10.17	28 37.16	41.90	31.73	31.73				
			29 19.68	24.50	29 51.50	56.24	31.82	31.74				
			31 45.38	50.25	32 17.20	21.92	31.82	31.67				
			33 37.04	41.91	34 8.80	13.60	31.76	31.69				
			35 57.13	2.01	36 28.92	33.70	31.79	31.69				
			37 42.66	47.52	38 14.47	19.30	31.81	31.78				
			39 18.75	23.62	39 50.43	55.38	31.68	31.76				
			41 25.73	30.45	41 57.43	2.30	31.70	31.85				
			43 33.42	38.22	44 5.12	9.92	31.70	31.70				
			45 10.73	15.51	45 42.35	47.20	+31.62	+31.69				
	Mean	. .	. . .	. .	. . .	. .	+31.749	+31.738				
				67$^{\text{r}}$.061	67$^{\text{r}}$.673							
				66.990	.545							
			h. m.	.931	.483							
			6 31	.949	.502							
				.911	.488							
	Mean	. .	. . .	66.968	67.538							
13	JAPETUS . . .	90	21 16 11.33	16.35	21 16 44.00	49.00	+32.67	+32.65	3 A	3	H.	JAPETUS north, following SATURN. Chron. corr., + 0$^{\text{m}}$.8. Very faint on account of haze. Parallel, 160°.6.
			17 28.10	33.12	18 0.78	5.80	32.68	32.68				
			18 52.48	57.55	19 25.23	30.22	32.75	32.67				
			20 7.44	12.53	20 40.18	45.20	32.74	32.67				
			22 6.38	11.39	22 39.15	44.12	32.77	32.73				
			24 5.90	10.87	24 38.53	43.70	32.63	32.83				
			31 53.86	58.86	32 26.60	31.52	32.74	32.66				
			33 11.62	16.66	33 44.30	49.37	32.68	32.71				
			34 23.91	28.91	34 56.43	1.55	32.52	32.64				
			37 6.01	11.01	37 38.72	43.70	32.71	32.69				
			38 50.23	55.27	39 22.97	28.00	32.74	32.73				
			40 42.04	47.12	41 14.73	19.85	32.69	32.73				
			42 21.21	26.17	42 53.90	58.97	32.69	32.80				
			43 49.14	54.15	44 21.84	26.80	+32.70	+32.65				
	Mean	. .	. . .	. .	. . .	. .	+32.696	+32.703				
				61$^{\text{r}}$.013	60$^{\text{r}}$.526							
			h. m.	60.920	.550							
			6 27	.902	.432							
				.864	.341							
				.753	.383							
	Mean	. .	. .	60.890	60.446							
16	JAPETUS . . .	90	21 46 42.53	47.67	21 47 16.63	21.80	+34.10	+34.13	3 A	1	H.	JAPETUS north, following SATURN. No declinations observed. The poorest images I have seen of SATURN and satellites. Much wind. Stopped by clouds.
			48 21.62	26.79	48 55.80	0.85	34.18	34.06				
			50 18.03	23.21	50 52.34	57.33	34.31	34.12				
			51 44.17	49.30	52 18.37	23.40	34.20	34.10				
			53 36.19	41.45	54 10.35	15.52	34.16	34.07				
			55 5.32	10.50	55 39.47	44.70	34.15	34.20				
			56 44.63	49.86	57 18.90	23.84	34.27	33.98				
			58 22.76	27.86	58 56.80	1.90	34.04	34.04				
			22 0 18.04	23.14	22 0 52.15	57.25	+34.11	+34.11				
	Mean	. .	. . .	. .	. . .	. .	+34.169	+34.090				

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		$\Delta\alpha$		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
Nov. 17	Japetus . . .	90	21 28 37.03	41.46	21 29 11.05	15.63	+34.02	+34.17	3 A	3	H.	Japetus south, following Saturn. Chron. corr., $0^{m}.0$. Japetus very faint at dec. obs., and faint also in A. R. obs.
			29 47.13	51.63	30 21.30	25.83	34.17	34.20				
			31 7.20	11.70	31 41.42	45.88	34.22	34.18				
			32 35.24	39.82	33 9.42	14.00	34.18	34.18				
			34 37.69	42.14	35 11.90	16.37	34.21	34.23				
			36 10.69	15.16	36 44.90	49.37	34.21	34.21				
			37 55.85	0.32	38 29.93	34.50	34.08	34.18				
			39 11.64	16.18	39 45.85	50.40	34.21	34.22				
			40 36.15	40.62	41 10.38	14.97	34.13	34.25				
			42 17.62	32.13	43 2.00	6.33	+34.38	+34.20				
	Mean	. .	. . .	. .	. . .	. .	+34.181	+34.202				
				$61^{r}.485$	$61^{r}.568$							
			h. m.	.554	.624							
			6 38	.460	.545							
				.394	.502							
				.322	.380							
	Mean	. .	. .	61.443	61.524							
22	Japetus . . .	90	21 39 46.58	51.19	21 40 17.88	22.40	+31.30	+31.21	5 A	3	H.	Japetus south, following Saturn. Chron. corr., + $0^{m}.2$. First set in A. R. with 600 A. Japetus faint on account of twilight.
			41 49.28	53.86	42 20.48	25.15	31.20	31.29				
			44 6.95	11.51	44 38.05	42.72	31.10	31.21				
			46 15.49	20.09	46 46.60	51.28	31.11	31.19				
			48 31.09	35.70	49 2.25	6.87	31.16	31.17				
			53 10.62	15.20	53 41.82	46.40	+31.20	+31.20				
	Mean	. .	. . .	. .	. . .	. .	+31.178	+31.212				
	Japetus . . .	90	21 57 29.88	34.60	21 58 1.00	5.64	+31.12	+31.04	3 A	3	H.	Japetus south, following Saturn. Chron. corr., + $0^{m}.2$. Assumed parallel, 160°.6. Correction for inclination of wires — $0^{s}.006$.
			59 26.60	31.16	59 57.70	2.32	31.10	31.16				
			22 1 16.71	21.36	22 1 47.85	52.50	31.14	31.14				
			2 56.94	1.60	3 28.13	32.62	31.19	31.02				
			4 25.51	30.12	4 56.66	1.22	31.15	31.10				
			6 25.02	29.63	6 56.25	0.85	31.23	31.22				
			8 20.55	25.12	8 51.66	56.25	31.11	31.13				
			10 31.80	36.47	11 2.90	7.55	31.10	31.08				
			12 30.55	35.12	13 1.60	6.30	+31.05	+31.18				
	Mean	. .	. . .	. .	. . .	. .	+31.132	+31.119				
				$65^{r}.522$	$66^{r}.290$							
			h. m.	.464	.268							
			6 19	.470	.150							
				.360	.085							
				.300	.052							
	Mean	. .	. .	65.423	66.169							
24	Japetus . . .	91	22 1 19.98	25.18	22 1 48.55	53.77	+28.57	+28.59	3 A	3	H.	Japetus south, following Saturn. Chron. corr., + $0^{m}.3$. Hyperion was seen early in the evening, but was invisible at end of Japetus observations.
			2 49.96	55.07	3 18.50	23.62	28.54	28.55				
			4 8.92	14.03	4 37.40	42.72	28.48	28.69				
			5 31.49	36.63	6 0.15	5.28	28.66	28.65				
			7 33.11	38.26	8 1.68	6.84	28.57	28.58				
			9 51.98	57.12	10 20.68	25.75	28.70	28.63				
			13 19.52	24.64	13 48.00	53.25	28.48	28.61				
			14 58.63	3.78	15 27.30	32.45	28.67	28.67				
			16 39.05	44.20	17 7.62	12.77	28.57	28.57				
			18 27.35	32.40	18 55.90	1.00	28.55	28.60				
			20 26.57	31.85	20 55.17	0.38	28.60	28.53				
			22 13.06	18.17	22 41.60	46.75	28.54	28.58				
			24 18.54	23.64	24 47.00	52.23	28.46	28.59				
			25 41.82	46.96	26 10.35	15.57	28.53	28.61				
			27 46.94	52.10	28 15.55	20.78	28.61	28.68				
			29 29.79	34.91	29 58.34	3.48	+28.55	+28.57				
	Mean	. .	. . .	. .	. . .	. .	+28.568	+28.606				
				$65^{r}.400$	$66^{r}.288$							
			h. m.	.371	.371							
			6 30	.147	.106							
				.066	.958							
				.130	.068							
	Mean	. .	. .	65.223	66.158							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δα		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
1875. Nov. 25	JAPETUS . . .	91	22 0 54.58	1.32	22 1 21.58	28.35	+27.00	+27.03	3 A	3	H.	JAPETUS south, following SATURN.
			2 45.44	52.13	3 12.50	19.24	27.06	27.11				Chron. corr., + 0^{m}.3.
			5 31.15	37.91	5 58.20	5.00	27.05	27.09				
			7 23.12	29.84	7 50.20	57.00	27.08	27.16				
			8 24.05	29.74	8 51.10	56.68	27.05	26.94				
			11 10.24	15.88	11 37.30	43.00	27.06	27.12				
			12 48.72	54.40	13 15.83	21.48	27.11	27.08				
			14 22.40	28.00	14 49.48	55.12	27.08	27.12				
			16 5.08	10.68	16 32.05	37.72	26.97	27.04				
			17 29.62	35.25	17 56.58	2.30	26.96	27.05				
			18 54.56	0.15	19 21.60	27.23	27.04	27.08				
			20 14.71	20.36	20 41.75	47.35	27.04	26.99				
			21 32.52	38.10	21 59.50	5.27	26.98	27.17				
			23 4.86	10.53	23 31.90	37.60	27.04	27.07				
			24 55.94	1.63	25 23.00	28.60	27.06	26.97				
			26 19.64	25.28	26 46.58	52.28	+26.94	+27.00				
	Mean	. .	. . .	. .	. . .	. .	+27.033	+27.064				
				66^{r}.411	67^{r}.460							
			h. m.	.295	.416							
			6 19	.278	.359							
				.186	.259							
				65.999	.040							
	Mean	. .	. .	66.234	67.307							
27	JAPETUS . . .	92	22 13 24.36	28.61	22 13 47.87	52.25	+23.51	+23.64	3 A	3	H.	JAPETUS south, following SATURN.
			14 45.82	50.13	15 9.40	13.62	23.58	23.49				Chron. corr., 0^{m}.4.
			16 13.76	18.18	16 37.38	41.65	23.62	23.47				Extremely bad images at first, but became tolerable.
			18 18.06	22.43	18 41.67	45.94	23.61	23.51				
			19 44.79	49.02	20 8.35	12.58	23.56	23.56				
			21 3.89	8.12	21 27.38	31.75	23.49	23.63				
			22 20.20	24.44	22 43.62	48.00	23.42	23.56				
			24 1.93	6.19	24 25.42	29.73	23.49	23.54				
			26 55.68	0.02	27 19.18	23.47	23.50	23.45				
			29 21.91	26.25	29 45.45	49.78	23.54	23.53				
			31 44.63	48.98	32 8.28	12.50	23.65	23.52				
			35 32.66	36.98	35 56.13	0.40	23.47	23.42				
			37 21.89	26.16	37 45.30	49.60	23.41	23.44				
			39 9.21	13.51	39 32.77	37.00	+23.56	+23.49				
	Mean	. .	. . .	. .	. . .	. .	+23.529	+23.518				
				58^{r}.812	60^{r}.020							
			h. m.	.716	59.948							
			6 25	.658	.814							
				.484	.689							
				.325	.541							
	Mean	. .		58.599	59.802							
29	JAPETUS . . .	92	22 50 48.23	52.79	22 51 7.60	12.27	+19.37	+19.48	3 A	3	H.	JAPETUS south, following SATURN.
			52 35.14	39.70	52 54.50	59.15	19.36	19.45				Chron. corr., + 0^{m}.5.
			54 28.65	33.28	54 48.20	52.60	19.55	19.32				Much wind, and images unsteady, especially in declination observations.
			57 4.01	8.60	57 23.37	27.90	19.36	19.30				
			22 58 58.98	3.54	22 59 18.32	22.92	19.34	19.38				
			23 0 44.93	49.51	23 1 4.38	8.96	19.45	19.45				
			2 36.60	41.15	2 55.96	0.53	19.36	19.38				
			4 21.03	25.60	4 40.35	44.97	19.32	19.37				
			9 7.65	12.22	9 26.95	31.43	19.30	19.21				
			11 15.92	20.58	11 35.27	39.86	19.35	19.28				
			13 45.64	50.15	14 4.95	9.60	19.31	19.45				
			15 24.56	29.23	15 43.88	48.52	19.32	19.29				
			16 50.12	54.77	17 9.48	14.22	+19.36	+19.45				
	Mean	. .	. . .	. .	. . .	. .	+19.365	+19.370				
				57^{r}.708	58^{r}.946	. .	. .	. .	. .	.	. .	*Weight = 2 for declination observations.
			h. m.	.559	.940							
			6 55	.525	.844*							
				.568	.924							
				.513	.866							
	Mean	. .		57.575	58.904							

Date.	Object observed.	Est. position angle.	Transit of Saturn's centre.		Transit of Satellite.		Δa		Eye-piece.	Image.	Observer.	Remarks.
			Wire I.	Wire II.	Wire I.	Wire II.	Wire I.	Wire II.				
1875.		°	h. m. s.	s.	h. m. s.	s.	s.	s.				
Nov. 30	JAPETUS . . .	93	23 19 15.48	20.30	23 19 32.72	37.55	+17.24	+17.25	3 A	2	H.	Chron, corr., $+ 0^m.6$.
			20 32.30	37.14	20 49.40	54.40	17.10	17.26				Bad image of SATURN
			21 54.80	59.61	22 11.87	16.80	17.07	17.19				Stopped by clouds.
			24 35.63	40.36	24 52.68	57.50	17.05	17.14				
			27 51.51	56.23	28 8.50	13.32	16.99	17.09				
			29 41.39	46.17	29 58.47	3.35	17.08	+17.18				
			31 36.11	40.93	31 53.22	. .	+17.11	. .				
	Mean	. .	. . .	. .	. . . .	. .	+17.091	+17.185				

RESULTS OF OBSERVATIONS OF THE SATELLITES OF SATURN.

ENCELADUS.

Date.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	°			h. m.	r.				
June 16	14 23	84.5	4	3	14 34	2.732	4	3	H.	
July 14	15 6	259.0	4	3	15 19	2.340	4	3	H.	
26	13 46	102.8	4	2	13 51	3.355	4	2	H.	
Aug. 5	12 28	256.1	4	2	12 34	2.018	3	2	H.	
26	11 51	315.5	4	2	11 58	2.813	4	2	H.	
30	11 40	279.1	.	2	11 44	3.601	2	2	H.	
Sept. 1	9 33	92.2	4	3	9 40	3.469	4	3	H.	
3	9 48	269.4	4	3	9 52	3.334	3	3	H.	
8	10 19	104.6	4	4	10 24	3.179	3	4	H,	
14	8 30	267.7	4	2	8 36	3.222	3	2	H.	
16	10 21	277.5	4	2	10 28	4.592	2	2	H.	Probably not Enceladus.
19	8 40	102.2	4	3	8 49	3.328	3	3	H.	
29	10 45	268.7	3	2	11 8	3.393	2	2	H.	
Oct. 2	8 15	278.1	4	3	8 24	3.526	4	3	H.	
17	9 4	278.2	4	2	9 15	3.541	2	2	H,	
22	7 49	109.7	4	3	7 54	2.626	2	3	H.	

TETHYS.

		°				r.				
June 20	14 6	85.9	4	2	14 27	4.293	4	2	H.	
24	14 56	104.2	4	3	15 9	3.480	3	3	H.	
26	14 49	112.9	4	3	15 34	2.094	3	3	H.	
30	15 10	236.2	3	2	15 29	1.499	3	2	H.	
July 12	15 0	287.7	4	3	15 10	2.958	4	3	H.	
14	14 48	303.6	4	3	14 58	1.658	3	3	H.	
24	13 9	92.9	4	2	13 16	4.463	3	3	H.	
26	13 7	97.3	4	3	13 26	4.527	4	3	H.	
27	13 29	280.6	4	2	13 37	4.346	4	2	H.	
29	13 11	284.4	4	3	13 27	3.551	4	3	H.	
Aug. 5	11 55	239.6	4	2	12 5	1.610	4	2	H.	
8	11 19	83.0	4	3	11 26	3.208	4	3	H.	
25	11 14	84.1	4	2	11 23	3.328	4	2	H.	
26	11 3	266.7	4	3	11 10	3.886	4	3	H.	
30	11 32	278.1	4	2	11 39	4.548	2	2	H.	
31	10 27	98.5	4	3	10 34	4.441	4	3	H.	
Sept. 1	10 30	281.0	4	3	10 36	4.255	3	3	H.	
2	10 35	105.2	4	2	10 44	3.763	3	2	H.	
3	9 56	285.9	4	3	10 1	3.544	3	3	H.	
6	10 32	145.2	4	2	10 39	1.360	3	2	H.	
8	10 43	228.8	4	3	10 51	1.393	3	3	H.	
9	9 36	51.2	4	3	9 43	1.419	4	3	H.	
13	9 21	86.9	4	2	9 37	3.844	1	2	Hn.	
14	8 43	268.5	4	2	9 18	4.267	2	2	H.	
19	8 58	102.3	4	3	9 5	4.055	3	3	H.	
29	10 41	266.8	4	3	10 55	3.899	2	3	H.	
Oct. 2	10 23	95.4	3	3	10 28	4.436	2	3	H.	
17	7 47	83.1	4	4	7 54	3.246	4	4	H.	
22	8 26	279.4	4	4	8 32	4.248	3	4	H.	

RESULTS OF OBSERVATIONS OF THE SATELLITES OF SATURN—Continued.

Date.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	Remarks.
					DIONE.					
1875.	h. m.	°			h. m.	r.				
June 20	14 10	93.6	4	2	14 54	4.370	3	2	H.	
24	15 15	262.6	4	3	15 21	3.950	3	3	H.	
26	14 44	103.8	4	3	15 28	4.708	3	3	H.	
30	15 37	281.4	3	2	15 43	5.367	2	3	H.	
July 12	14 40	91.8	4	3	14 50	5.314	4	3	H.	
14	15 26	297.6	4	3	15 32	2.812	2	3	H.	
26	13 11	98.5	4	3	13 34	5.756	4	3	H.	
27	13 13	268.0	4	2	13 20	4.808	4	2	H.	
29	13 8	108.3	4	3	13 18	4.208	4	3	H.	
Aug. 5	11 40	294.3	4	3	11 46	3.331	4	3	H.	
8	12 23	33.3	4	3	12 33	1.456	4	3	H.	
25	11 31	94.3	4	2	11 40	5.832	4	3	H.	
26	10 48	252.5	4	2	10 55	3.005	4	2	H.	
30	10 57	53.1	4	2	11 4	1.946	4	2	H.	
31	10 40	114.9	4	3	10 46	3.582	4	3	H.	
Sept. 1	10 19	277.5	4	3	10 25	5.958	3	3	H.	
2	10 19	83.7	4	3	10 27	4.276	4	3	H.	
3	9 39	159.3	4	3	9 44	1.481	3	3	H.	
6	11 9	259.5	4	3	11 18	3.781	4	3	H.	
7	10 19	312.0	4	3	10 25	2.165	2	3	H.	
8	10 31	103.8	4	4	10 38	5.263	3	4	H.	
9	9 18	269.6	4	3	9 27	5.263	4	3	H.	
13	9 28	85.2	4	2	9 40	4.531	1	2	Hn.	
14	9 11	181.7	4	2	9 56	1.404	2	2	H.	
16	9 19	94.4	4	3	9 28	5.762	3	2	H.	
19	9 16	103.3	4	3	9 22	5.173	3	3	H.	
29	10 8	353.6	4	3	10 17	1.384	2	3	H.	
Oct. 2	9 0	69.2	4	3	9 10	2.778	4	3	H.	
17	8 43	237.6	4	3	8 52	2.196	4	3	H.	
22	8 1	108.8	4	3	8 7	4.252	4	3	H.	
Dec. 2	6 5	101.9	4	3	6 20	4.730	3	3	H.	
					RHEA.					
		°				r.				
June 20	14 15	86.7	4	2	14 39	6.164	3	2	H.	
24	14 43	47.8	4	3	14 50	2.066	3	3	H.	
26	14 53	146.8	3	3	15 40	1.884	3	3	H.	
30	14 20	105.2	4	2	14 55	6.298	3	2	H.	
July 12	14 25	24.7	4	3	14 33	1.755	4	3	H.	
14	15 37	140.8	3	3	15 41	2.397	2	3	H.	
24	13 34	269.0	4	3	13 45	7.156	3	3	H.	
26	13 4	80.3	4	3	13 17	5.129	4	3	H.	
27	12 58	102.2	4	2	13 5	7.419	4	2	H.	
29	13 34	278.0	4	3	13 41	8.238	4	3	H.	
Aug. 5	11 18	100.1	4	3	11 25	7.877	4	3	H.	
8	12 45	332.2	4	3	12 53	2.122	4	3	H.	
25	11 48	275.1	4	2	11 57	8.294	4	2	H.	
30	11 53	285.7	4	2	12 0	6.950	4	2	H.	
31	10 10	60.5	4	3	10 16	3.116	4	3	H.	
Sept. 1	9 48	97.7	4	3	9 56	8.174	4	3	H.	
3	10 6	273.4	4	3	10 13	8.118	3	3	H.	
6	10 44	111.4	4	3	10 54	5.626	3	3	H.	
7	9 47	257.4	4	3	10 12	5.324	4	3	H.	
8	10 56	284.1	4	4	11 4	7.294	3	4	H.	
9	8 40	44.0	4	3	8 48	2.458	4	3	H.	
14	8 57	84.7	4	2	9 36	6.556	2	2	H.	
16	9 59	257.0	4	2	10 8	4.852	3	2	H.	
19	9 30	96.5	4	3	9 37	8.093	3	3	H.	
29	10 26	155.4	4	3	10 35	2.291	2	3	H.	
Oct. 2	9 20	83.3	4	3	9 27	5.982	3	3	H.	
17	8 26	130.1	4	3	8 35	3.286	4	3	H.	
22	8 16	238.2	4	4	8 22	3.051	3	4	H.	

RESULTS OF OBSERVATIONS OF THE SATELLITES OF SATURN—Continued.

RHEA—Continued.

Date.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	°			h. m.	r.				
Nov. 8	7 8	100.8	4	2	7 12	7.167	1	2	H.	
17	7 8	100.0	4	3	7 15	7.201	2	3	H.	
Dec. 2	6 32	258.9	4	3	6 40	4.629	3	3	H.	
						TITAN.				
		°				r.				
June 20	15 13	334.9	4	3	15 24	3.992	4	3	H.	
July 14	15 45	151.3	2	3	15 50	4.796	2	3	H.	
24	13 51	83.2	3	3	13 56	8.140	2	3	H.	
24	14 5	83.0	2	.	14 15	8.286	1	.	D.	D. for Prof. C. L. Doolittle.
26	14 14	95.2	2	.	14 20	20.575	2	.	D.	
29	13 52	116.8	3	.	14 16	10.380	2	.	D.	
Aug. 5	12 43	286.1	2	3	12 46	14.589	2	3	H.	
5	12 57	286.2	2	.	12 52	14.678	2	.	D.	
8	10 43	62.7	4	2	10 52	7.196	4	2	H.	
25	10 46	82.9	4	3	10 56	13.666	4	3	H.	
30	11 11	120.1	4	2	11 22	9.876	3	2	H.	
31	10 54	161.7	4	3	11 2	4.905	4	3	H.	
Sept. 1	10 7	235.7	4	3	10 13	6.678	3	3	H.	
8	10 8	4.1	4	3	10 14	4.360	3	3	H.	
9	8 55	65.8	4	4	9 3	7.999	4	4	H.	
14	9 6	107.9	4	2	9 47	14.896	2	2	H.	
16	9 37	165.6	4	2	9 50	4.807	4	2	H.	
19	9 45	269.4	4	3	9 52	16.684	3	3	H.	
Oct. 2	10 35	176.6	4	3	. .	. .	.	.	H.	
17	8 6	124.3	4	3	8 16	8.823	3	3	H.	
25	6 45	307.0	4	4	6 52	7.695	2	4	H.	
29	6 9	91.0	4	4	6 14	21.863	4	4	H.	
Dec. 2	5 47	101.8	4	4	5 54	15.986	4	4	H.	

TITAN.

Date.	Washington Mean Time.	Δa	Number of measures.	Weight.	Washington Mean Time.	$\Delta \delta$	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	s.			h. m.	r. ″				
June 24	13 48	+12.718	26	3	14 20	−1.524=−15.16	5	3	H.	
26	13 52	+10.462	30	3	14 21	−1.912=−19.02	5	3	H.	
July 12	13 47	+10.450	22	3	14 16	−4.033=−40.12	5	3	H.	
26	12 18	+13.280	24	3	12 46	−1.742=−17.33	5	3	H.	
27	12 22	+12.767	28	2	12 45	−3.168=−31.52	5	2	H.	
Aug. 26	9 56	+12.222	22	3	10 23	−0.144=− 1.42	5	3	H.	
Sept. 4	9 28	−12.684	24	2	9 43	+1.622=+16.14	5	2	H.	
6	9 24	− 9.309	28	2	9 48	+4.406=+43.83	5	2	H.	
11	9 43	+12.331	24	3	10 0	−0.192=− 1.91	5	3	H.	
27	9 22	+12.230	12	2	10 4	−0.417=− 4.15	5	2	H.	
29	9 12	+12.078	28	2	9 43	−3.729=−37.10	5	2	H.	
30	8 28	+ 9.442	20	3	9 7	−4.697=−46.73	5	3	H.	
Oct. 5	7 21	−11.119	30	3	8 2	−0.214=− 2.13	5	3	H.	
7	7 37	−11.367	12	2	8 10	+3.278=+32.61	5	2	H.	
12	7 9	+ 9.334	20	2	7 34	+1.632=+16.24	5	2	H.	
13	8 2	+12.001	22	2	8 33	−0.345=− 3.43	5	2	H.	
21	7 8	−10.960	30	2	7 39	−0.139=− 1.38	5	2	H.	
22	6 40	−11.997	24	4	7 19	+1.712=+17.03	5	4	H.	
22	6 57	−11.958	24	4	. .	. . . . .	.	.	T.	T. for D. P. Todd.
Nov. 8	6 13	−10.773	42	3	6 42	+3.211=+31.95	5	3	H.	

RESULTS OF OBSERVATIONS OF THE SATELLITES OF SATURN—Continued.

HYPERION.

Date.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	°			h. m.	r.				
June 16	14 48	99.0	4	3	15 3	21.410	4	3	H.	
July 16	13 54	277.0	4	2	14 3	21.732	4	2	H.	
26	14 1	91.2	2	3	14 5	23.257	2	3	H.	
29	12 37	100.7	5	3	12 55	21.094	5	3	H.	
Aug. 8	11 36	284.7	4	3	11 52	18.944	4	3	H.	
25	10 26	266.5	4	2	10 34	17.673	4	2	H.	
26	12 6	269.8	4	2	12 13	19.506	4	2	H.	
29	10 33	283.3	4	3	10 39	19.882	4	3	H.	
31	9 54	299.8	4	2	10 1	12.154	4	2	H.	
Sept. 1	11 35	326.1	4	.	11 41	7.199	2	.	H.	
6	10 10	87.6	4	3	10 18	21.723	4	3	H.	
9	10 57	99.1	4	3	11 3	22.865	4	3	H.	
11	10 24	110.2	4	2	10 33	15.332	4	2	H.	
19	8 7	282.0	4	3	8 14	20.495	4	3	H.	
20	9 30	287.9	4	2	9 40	17.634	4	2	H.	
24	9 54	50.8	4	.	10 1	8.254	1	.	H.	
29	8 16	94.1	4	4	8 24	23.664	4	4	H.	
Oct. 2	8 36	108.4	4	3	8 45	16.747	4	3	H.	
3	7 39	118.1	4	3	7 48	11.801	4	3	H.	
17	7 28	75.6	4	3	7 36	14.361	4	3	H.	
19	7 50	88.2	4	3	7 57	21.101	4	3	H.	
20	7 2	92.1	4	2	7 12	22.512	5	2	H.	
21	7 58	96.2	4	3	8 8	22.776	4	3	H.	
22	7 31	100.0	4	4	7 38	21.186	4	4	H.	
24	6 23	112.1	4	4	6 31	13.532	4	4	H.	
28	6 32	261.0	2	2	6 44	13.560	2	2	H.	
29	6 31	268.5	4	3	6 52	17.605	4	3	H.	
Nov. 2	7 19	290.4	4	2	7 44	15.675	4	2	H.	
11	7 17	94.9	4	2	7 26	22.126	2	2	H.	
12	6 44	98.4	3	2	6 52	21.305	2	2	H.	
22	6 34	280.9	4	3	6 43	18.983	4	3	H.	
25	6 31	307.6	3	2	6 39	9.263	2	2	H.	

HYPERION.

Date.	Washington Mean Time.	$\Delta\alpha$	Number of measures.	Weight.	Washington Mean Time.	$\Delta\delta$	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	s.			h. m.	r. ″				
June 24	14 1	−13.764	10	3	14 27	+1.382=+13.75	3	3	H.	
26	13 56	−12.707	16	3	14 29	+3.960=+39.40	5	3	H.	
July 14	14 9	−11.894	14	2	14 35	−0.493=− 4.91	2	2	H.	
26	12 18	+16.056	24	3	12 53	−0.235=− 2.34	5	3	H.	
29	11 44	+14.505	24	2	11 48	−3.996=−39.71	5	2	H.	
Aug. 26	9 55	−12.919	20	3	10 15	−0.197=− 1.95	5	3	H.	
31	9 25	− 6.999	7	3	9 45	+6.100=+60.70	3	3	H.	
Sept. 7	9 10	+16.565	24	3	9 31	−0.695=− 6.92	5	3	H.	
8	9 25	+16.767	22	3	9 44	−2.146=−21.35	5	3	H.	
9	9 28	+15.809	14	2	10 42	−3.514=−34.96	3	2	H.	
27	9 11	+14.050	20	2	9 52	+1.542=+15.34	5	2	H.	
29	9 12	+16.466	14	3	9 55	−2.584=−25.71	3	3	H.	
30	8 28	+15.924	20	3	9 18	−3.120=−31.04	5	3	H.	
Oct. 7	8 22	−10.792	24	2	8 21	−1.572=−15.64	5	2	H.	
17	6 42	+ 9.795	18	2	7 5	+3.543=+35.25	5	2	H.	
19	7 6	+14.828	6	1	7 41	+0.651=+ 6.48	3	1	H.	
21	7 8	+15.989	17	2	7 48	−2.451=−24.39	3	2	H.	

RESULTS OF OBSERVATIONS OF THE SATELLITES OF SATURN—Continued.

JAPETUS.

Date.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	°			h. m.	r.				
June 30	14 16	90.7	4	2	14 44	7.812	3	2	H.	
Aug. 5	12 15	270.9	4	3	12 20	25.651	4	3	H.	
Sept. 14	9 1	95.4	4	2	9 42	18.313	2	2	H.	
16	8 54	100.5	4	3	9 8	10.111	4	3	H.	
19	8 21	235.8	4	4	8 33	3.572	3	4	H.	
20	9 50	255.5	4	2	9 57	7.711	2	2	H.	
Oct. 25	6 27	277.7	4	4	6 34	15.290	4	4	H.	
27	6 46	286.5	4	2	6 58	7.172	4	2	H.	
28	6 10	287.5	4	3	6 20	6.146	3	3	H.	
29	7 0	37.9	4	4	7 7	2.528	3	4	H.	
Dec. 2	5 30	94.5	4	4	5 40	17.977	4	4	H.	

JAPETUS.

Date.	Washington Mean Time.	△α	Number of measures.	Weight.	Washington Mean Time.	△δ	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	s.			h. m.	r. ″				
June 10	15 1	+35.059	20	3	15 22	+1.181=+11.75	5	3	H.	
12	15 3	+35.714	24	2	14 45	+1.179=+11.73	5	2	H.	
13	14 42	+35.712	10	2	. .	. . . . .	.	.	.	
14	14 1	+35.402	26	3	14 19	+1.178=+11.72	5	3	H.	
16	13 46	+34.213	26	3	14 6	+1.124=+11.18	5	3	H.	
20	13 28	+29.350	28	2	13 44	+0.896=+ 8.91	5	2	H.	
24	13 48	+21.328	26	3	14 9	+0.562=+ 5.59	5	3	H.	
26	13 52	+16.469	30	3	14 13	+0.326=+ 3.24	5	3	H.	
July 12	13 46	−26.670	22	3	14 6	−1.064=−10.59	5	3	H.	
14	13 55	−30.626	28	3	14 21	−1.136=−11.30	5	3	H.	
16	12 28	−33.785	26	2	12 57	−1.182=−11.76	5	2	H.	
24	12 5	−37.988	28	2	12 56	−0.741=− 7.37	5	2	H.	
26	12 17	−36.764	28	3	12 38	−0.613=− 6.10	5	3	H.	
27	12 21	−35.760	28	2	12 39	−0.453=− 4.51	5	2	H.	
29	11 43	−33.137	28	2	11 40	−0.346=− 3.44	5	2	H.	
Aug. 25	9 48	+35.000	26	2	10 6	+0.874=+ 8.69	5	2	H.	
26	9 56	+36.167	22	3	10 34	+0.736=+ 7.32	5	3	H.	
29	9 54	+37.837	36	3	10 21	+0.394=+ 3.92	5	3	H.	
30	10 23	+37.965	26	2	10 49	+0.247=+ 2.46	5	2	H.	
31	9 20	+37.689	24	3	9 38	+0.087=+ 0.87	5	3	H.	
Sept. 1	11 9	+37.242	22	4	11 26	−0.066=− 0.66	5	4	H.	
2	9 30	+36.525	34	3	9 54	−0.227=− 2.26	5	3	H.	
3	8 59	+35.672	20	4	9 26	−0.387=− 3.85	5	4	H.	
4	9 29	+34.465	24	2	9 58	−0.487=− 4.85	5	2	H.	
6	9 25	+31.526	28	3	9 57	−0.825=− 8.21	5	3	H.	
7	9 10	+29.735	24	4	9 38	−1.073=−10.68	5	4	H.	
8	9 25	+27.700	22	3	9 53	−1.072=−10.62	5	3	H.	
9	9 10	+25.544	22	3	10 49	−1.230=−12.24	5	3	H.	
11	9 43	+20.750	26	3	10 7	−1.425=−14.18	5	3	H.	
27	9 10	−23.590	20	3	9 39	−1.524=−15.16	5	3	H.	
29	9 11	−27.793	28	3	9 33	−1.344=−13.37	5	3	H.	
30	8 27	−29.626	20	4	8 56	−1.249=−12.43	5	4	H.	
Oct 2	7 40	−32.770	20	3	8 0	−0.935=− 9.30	5	3	H.	
5	7 20	−36.030	30	3	7 52	−0.471=− 4.69	5	3	H.	
7	8 6	−37.131	36	2	8 0	−0.130=− 1.29	5	2	H.	
9	6 51	−37.371	28	3	7 20	+0.194=+ 1.93	4	3	H.	
12	7 8	−35.998	20	2	7 26	+0.688=+ 6.85	5	2	H.	
13	8 1	−35.010	22	2	8 22	+0.851=+ 8.47	5	2	H.	
17	6 41	−29.443	18	3	6 56	+1.384=+13.77	5	3	H.	
19	7 5	−25.376	18	2	7 30	+1.626=+16.18	3	2	H.	
21	7 7	−20.850	30	2	7 29	+1.814=+18.05	5	2	H.	
22	6 40	−18.428	24	4	7 12	+1.883=+18.74	5	4	H.	
22	6 57	−18.378	24	4	. .	. . . . .	.	.	T.	

RESULTS OF OBSERVATIONS OF THE SATELLITES OF SATURN—Continued.

JAPETUS—Continued.

Date.	Washington Mean Time.	$\Delta\alpha$	Number of measures.	Weight.	Washington Mean Time.	$\Delta\delta$	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	s.			h. m.	r. ″				
Nov. 5	6 40	+19.781	28	3	7 0	+1.531=+15.23	5	3	H.	
6	6 59	+22.103	28	3	7 21	+1.382=+13.75	5	3	H.	
8	6 14	+21.968	42	3	6 52	+1.954=+19.44	5	3	H.	
11	6 39	+30.671	26	3	7 4	+0.735=+ 7.31	5	3	H.	
12	6 7	+31.744	28	4	6 32	+0.570=+ 5.67	5	4	H.	
13	6 1	+32.700	28	3	6 28	+0.444=+ 4.42	5	3	H.	
16	6 12	+34.130	18	1	. .	. . . . . .	.	.	H.	
17	5 50	+34.191	20	3	6 38	−0.081=− 0.81	5	3	H.	
22	5 40	+31.189	12	3	. .	. . . . . .	.	.	H.	
22	6 0	+31.120	12	3	6 19	−0.746=− 7.42	5	3	H.	
24	6 2	+23.587	32	3	6 30	−0.935=− 9.30	5	3	H.	
25	5 58	+27.048	32	3	6 19	−1.073=−10.68	5	3	H.	
27	5 51	+23.524	28	3	6 25	−1.203=−11.97	5	3	H.	
29	6 31	+19.367	26	3	6 56	−1.329=−13.22	5	2	H.	
30	6 49	+17.136	13	2	. .	. . . . . .	.	.	H.	

OBSERVATIONS OF THE ECLIPSES OF JUPITER'S FIRST SATELLITE IN 1875.

Date.	Disappearance or Reappearance.	Clock or Chronometer Time.	Clock or Chron. Correction.	Washington Mean Time of Reappearance or Disappearance.	Amer. Eph. Time.	O. − C.	Aperture.	Mag. Power.	Observer.
1875.		h. m. s.	m. s.	h. m. s.	m. s.	s.	in.		
Jan. 14	Disappearance . .	12 5 58 ± 10^{s}	. .	16 34 10.5	33 46.6	+ 23.9	9.6	132	T.
Feb. 22	Do.	13 8 3.9	. .	14 57 21.5	56 37.8	. .	26	?	Hn.
Mar. 17	Do.	15 5 10	− 3.2	15 5 6.8	4 58.0	+ 8.8	26	?	Hn.
April 20	Reappearance . .	8 14 3	− 1 5.3	8 12 57.7	12 41.8	+ 15.9	26	?	Hn.
May 4	Do.	12 2 4	. .	. . .	. . .	. .	. .	.	Hn.
Aug. 6	Do.	7 18 13	− 6.1	7 18 6.9	17 17.0	+ 49.9	9.6	132	Todd.
6	Do.	16 18 3.8	. .	7 17 47.7	17 17.0	+ 30.7	26	400	Hn.
29	Do.	7 31 25	− 38.4	7 30 46.6	29 53.9	+ 52.7	9.6	202	Todd.
Dec. 18	Disappearance . .	17 22 35	− 32.6	17 22 2.4	. . .	. .	5	.	Todd.

RESULTS OF OBSERVATIONS OF THE SATELLITES OF URANUS IN 1875.

OBERON.

Date.	Washington Mean Time.	Position angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	°			h. m.	r. ″				
Jan. 5	14 33	13.4	3	4	. .	. . . .	.	.	Hn.	
26	10 31	185.5	5	4	11 14	4.714=46.90	3	3	Hn.	
Feb. 1	10 42	16.6	3	.	11 23	4.508=44.85	3	.	Hn.	
16	8 26	353.2	4	4	9 7	4.406=43.65	2	4	Hn.	
22	8 25	184.5	3	5	8 38	4.660=46.36	3	5	Hn.	
26	9 45	60.6	4	3	10 9	3.060=30.43	1	2	Hn.	

RESUTS OF OBSERVATIONS OF THE SATELLITES OF URANUS—Continued.

OBERON—Continued.

Date.	Washington Mean Time.	Position angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	°			h. m.	r. ″				
March 4	8 15	275.3	3	4	8 47	2.583=25.70	3	2	Hn.	
4	8 34	273.9	1	4	. .	. . . .	.	.	Hn.	
8	9 15	175.9	4	.	9 2	4.400=43.77	4	.	N.	
13	9 0	23.1	3	.	8 37	4.193=41.71	4	.	N.	
22	. .	. .	.	.	8 21	4.113=40.92	4	4	N.	
25	9 6	60.4	4	.	8 37	2.898=28.83	4	.	N.	
27	9 21	13.7	5	.	8 53	4.408=43.85	4	.	N.	
April 5	7 43	156.5	5	2	8 8	3.714=36.95	4	2	H.	
5	10 4	154.1	3	3	9 19	3.601=35.82	4	3	N.	
6	7 50	127.3	5	2	8 13	2.853=28.38	2	2	H.	
8	8 30	44.2	4	3	. .	. . . .	.	.	H.	
14	9 18	242.3	4	2	8 44	2.739=27.25	4	.	H.&N.	
20	8 28	101.4	4	2	8 48	2.496=24.83	4	2	H.	
21	8 6	57.9	5	2	8 18	2.954=29.39	4	2	H.	
23	8 3	14.0	4	3	8 16	4.342=43.20	4	3	H.	
25	7 57	341.0	4	3	8 13	3.695=36.76	4	3	H.	
29	8 24	205.4	4	2	8 45	4.016=39.95	4	2	H.	
May 2	8 5	154.3	4	3	8 15	3.454=34.36	4	3	H.	
4	8 26	77.6	4	2	8 38	2.588=25.75	4	2	H.	
6	7 59	20.0	4	4	8 7	4.086=40.65	4	4	H.	
11	8 18	241 5	4	2	. .	. . . .	.	.	H.	
13	8 10	197.3	5	3	8 39	4.238=42.16	4	3	H.	
14	8 10	182.4	4	2	. .	. . . .	.	.	H.	
16	9 17	138.3	4	2	9 24	2.988=29.73	3	2	H.	
17	8 28	95.9	4	2	8 37	2.412=24.00	4	2	H.	
19	8 24	29.2	4	2	8 37	3.748=37.29	4	2	H.	
22	8 25	338.8	4	2	8 41	3.565=35.47	4	2	H.	
25	8 21	229.6	4	2	8 45	3.152=31.36	4	2	H.	
27	8 27	189.3	4	3	8 45	4.261=42.39	3	3	H.	
28	8 28	173.4	4	3	8 59	4.031=40.10	4	3	H.	

TITANIA.

		°				r. ″				
Jan. 5	14 19	34.4	4	4	. .	. . . .	.	.	Hn.	
26	11 2	259.6	3	4	10 47	1.952=19.42	4	2	Hn.	
Feb. 1	10 35	15.0	5	.	11 20	3.358=33.41	2	.	Hn.	
16	8 39	137.8	5	4	8 50	2.261=22.49	2	4	Hn.	
22	8 15	220.0	3	5	9 4	2.776=27.62	3	3	Hn	
26	9 38	49.7	2	4	10 5	2.402=23.91	1	4	Hn.	
26	9 53	52.9	1	1	. .	. . . .	.	.	Hn.	
March 4	8 3	184.3	4	4	8 28	3.486=34.68	3	4	Hn.	
4	8 40	183.9	1	4	. .	. . . .	.	.	Hn.	
8	9 25	11.0	4	.	8 49	3.413=33.95	4	.	N.	
13	8 57	175.6	3	.	8 47	3.289=32.72	4	.	N.	
22	. .	. .	.	.	8 22	3.095=30.79	4	4	N.	
25	8 56	21.6	4	.	8 47	3.114=30.98	4	.	N.	
27	9 29	325.3	4	.	9 9	2.429=24.17	4	.	N.	
April 5	8 26	310.6	5	2	8 42	2.146=21.35	4	2	H.	
5	9 55	308.9	5	3	9 43	2.109=20.98	4	3	N.	
8	8 8	178.1	5	3	8 20	3.351=33.34	4	3	H.	
14	. .	. .	.	.	9 2	1.938=19.28	4	.	N.	
20	8 1	26.5	4	2	8 14	2.982=29.67	4	2	H.	
21	7 58	1.8	5	3	8 31	3.295=32.78	4	3	H.	
23	8 27	271.2	4	2	8 38	1.868=18.58	4	3	H.	
25	8 23	189.2	4	3	8 43	3.304=32.87	4	3	H.	
29	8 18	19.0	4	2	8 34	3.143=31.27	4	2	H.	

RESULTS OF OBSERVATIONS OF THE SATELLITES OF URANUS—Continued.

TITANIA—Continued.

Date.	Washington Mean Time.	Position angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	°			h. m.	r. ″				
May 2	8 27	249.6	4	2	8 45	1.960=19.50	4	2	H.	
4	8 1	182.9	4	3	8 13	3.257=32.40	4	3	H.	
4	. .	. .	.	.	9 8	3.242=32.25	4	.	N.	
6	8 18	99.3	4	3	8 26	1.862=18.57	4	3	H.	
12	8 8	202.6	4	2	8 21	3.060=30.44	4	2	H.	
13	8 2	176.5	4	3	8 22	3.144=31.28	4	3	H.	
14	8 3	142.3	4	2	8 21	2.175=21.64	3	2	H.	
16	8 56	29.0	4	2	9 7	2.844=28.29	3	2	H.	
17	8 10	4.8	4	2	8 20	3.236=32.19	4	2	H.	
22	8 31	170.0	4	2	8 50	2.819=28.04	2	2	H.	
25	8 15	20.7	4	3	8 32	3.042=30.26	4	3	H.	
27	8 33	323.4	4	2	8 57	2.299=22.87	3	2	H.	
28	8 36	256.7	4	2	8 45	1.862=18.52	3	2	H.	

UMBRIEL.

Date.	Washington Mean Time.	Position angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	Remarks.
		°				r. ″				
Mar. 25	. .	. .	.	.	8 58	1.800=17.91	3	1	N.	
25	10 4	24.6	4	.	. .	. . .	.	.	Hn.	
27	9 52	210.4	3	.	9 59	1.726=17.17	2	.	N.	
May 6	8 37	7.7	5	.	8 49	2.011=20.01	3	.	H.	
6	. .	. .	.	.	9 6	1.841=18.32	1	.	Hn.	

ARIEL.

Date.	Washington Mean Time.	Position angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	Remarks.
		°				r. ″				
Feb. 1	10 14	196.6	2	.	. .	. . .	.	.	Hn.	
April 14	8 33	8.2	4	.	8 21	1.460=14.52	3	.	N.	
Mar. 22	8 46	36.7	2	.	8 46	1.243=12.37	3	1	N.	
22	9 9	35.8	1	.	. .	. . .	.	.	Hn.	
25	9 42	349.5	3	.	9 42	1.390=13.83	2	.	N.	

RESULTS OF OBSERVATIONS OF THE SATELLITE OF NEPTUNE

Date.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	°			h. m.	r.				
Jan. 4	7 28	43.1	3	1	. .	. .	.	.	Hn.	
5	6 57	28.5	5	1	. .	. .	.	.	Hn.	
5	7 25	. .	.	.	. .	1.584	5	2	Hn.	
11	8 52	27.3	5	4	. .	. .	.	.	Hn.	
22	8 1	39.7	5	.	. .	. .	.	.	Hn.	
25	7 31	219.5	5	2	. .	. .	.	.	Hn.	
25	7 55	. .	.	.	. .	1.704	4	1	Hn.	
26	8 12	197.4	3	1	. .	. .	.	.	Hn.	
26	8 27	. .	.	.	. .	1 098	1	1	Hn.	
Feb. 1	7 47	196.6	2	1	. .	. .	.	.	Hn.	
3	7 44	35.9	5	2	. .	. .	.	.	Hn.	
5	7 31	236.9	5	4	. .	. .	.	.	Hn.	
17	7 15	228.8	4	1	. .	. .	.	.	Hn.	
Sept. 6	12 19	201.0	5	3	. .	. .	.	.	H.	
6	12 30	. .	.	.	. .	1.196	5	3	H.	
8	11 50	41.6	5	4	. .	. .	.	.	H.	
8	11 59	. .	.	.	. .	1.707	5	4	H.	
9	12 11	20.6	5	2	. .	. .	.	.	H.	

RESULTS OF OBSERVATIONS OF THE SATELLITE OF NEPTUNE—Continued.

Date.	Washington Mean Time.	Position Angle.	Number of measures.	Weight.	Washington Mean Time.	Distance.	Number of measures.	Weight.	Observer.	Remarks.
1875.	h. m.	°			h. m.	r.				
Sept. 9	12 20	. .	.	.	. .	1.168	5	2	H.	
20	11 44	37.2	5	2	. .	. . .	.	.	H.	
20	11 53	. .	.	.	. .	1.732	4	2	H.	
26	11 20	32.3	6	5	. .	. . .	.	.	Hn.	
26	11 50	. .	.	.	. .	1.665	3	5	Hn.	
29	11 40	215.1	5	3	. .	. . .	.	.	H.	
29	12 0	. .	.	.	. .	1.640	4	3	H.	
Oct. 2	10 53	33.8	5	3	. .	. . .	.	.	H.	
2	11 6	. .	.	.	. .	1.693	5	3	H.	
2	11 43	. .	.	.	. .	1.712	4	2	Hn.	
5	10 26	212.5	4	5	. .	. . .	.	.	Hn.	
5	10 46	. .	.	.	. .	1.692	4	5	Hn.	
5	11 5	. .	.	.	. .	1.684	3	5	Hn.	
7	10 35	46.6	4	1	. .	. . .	.	.	Hn.	
13	9 27	48.7	3	2	. .	. . .	.	.	Hn.	
13	9 58	48.9	4	2	. .	. . .	.	.	Hn.	
13	9 48	. .	.	.	. .	1.440	10	2	Hn.	Single distances.
16	10 45	227.4	5	2	. .	. . .	.	.	Hn.	
16	11 4	. .	.	.	. .	1.581	3	2	Hn.	
17	11 54	205.1	5	3	. .	. . .	.	.	Hn.	
17	12 22	. .	.	.	. .	1.399	4	3	Hn.	
19	9 30	46.2	5	4	. .	. . .	.	.	Hn.	
19	9 52	. .	.	.	. .	1.540	5	4	Hn.	
20	10 50	24.5	4	2	. .	. . .	.	.	Hn.	
20	11 11	. .	.	.	. .	1.398	3	2	Hn.	
22	10 31	223.4	4	4	. .	. . .	.	.	Hn.	
22	10 47	. .	.	.	. .	1.694	3	4	Hn.	
25	9 45	41.0	5	4	. .	. . .	.	.	Hn.	
25	9 27	. .	.	.	. .	1.693	10	4	Hn.	Difference of declination.
29	9 9	201.1	6	3	. .	. . .	.	.	Hn.	
29	9 36	. .	.	.	. .	1.278	5½	3	Hn.	
31	9 53	40.2	4	2	. .	. . .	.	.	Hn.	
31	10 17	. .	.	.	. .	1.720	5	2	Hn.	
Nov. 5	8 53	71.9	4	2	. .	. . .	.	.	Hn.	
5	9 34	. .	.	.	. .	0.778	2	2	Hn.	
6	8 23	40.1	4	2	. .	. . .	.	.	Hn.	
6	8 37	. .	.	.	. .	1.718	5	2	Hn.	Single distances.
6	8 53	. .	.	.	. .	1.701	3	3	Hn.	
8	9 12	244.4	5	1	. .	. . .	.	.	Hn.	
8	11 1	. .	.	.	. .	1.009	5	1	Hn.	Single distances.
12	10 36	34.7	4	2	. .	. . .	.	.	Hn.	
12	10 52	. .	.	.	. .	1.762	4	2	Hn.	
15	8 43	216.2	4	2	. .	. . .	.	.	Hn.	
15	9 6	. .	.	.	. .	1.773	6	2	Hn.	
15	9 29	214.2	4	2	. .	. . .	.	.	Hn.	
17	9 0	58.0	6	1	. .	. . .	.	.	Hn.	
17	9 30	. .	.	.	. .	1.114	6	1	Hn.	Single distances.
22	9 14	173.2	2	1	. .	. . .	.	.	Hn.	
22	9 0	. .	.	.	. .	0.61	2	1	Hn.	
24	8 2	32.7	5	3	. .	. . .	.	.	Hn.	
24	8 24	. .	.	.	. .	1.679	5	3	Hn.	
27	7 30	214.7	5	2	. .	. . .	.	.	H.	
27	7 42	. .	.	.	. .	1.625	5	2	H.	
29	7 55	53.6	4	1	. .	. . .	.	.	H.	
29	8 10	. .	.	.	. .	1.317	5	2	Hn.	Single distances.
29	8 29	50.5	8	2	. .	. . .	.	.	Hn.	
30	7 57	32.2	5	3	. .	. . .	.	.	H.	
30	8 12	. .	.	.	. .	1.638	5	3	H.	
Dec. 2	8 21	230.3	5	3	. .	. . .	.	.	H.	
2	8 35	. .	.	.	. .	1.423	5	3	H.	
15	6 40	207.2	5	3	. .	. . .	.	.	H.	
15	6 56	. .	.	.	. .	1.403	5	3	H.	
17	9 0	41.3	3	3	. .	. . .	.	.	H.	
20	6 2	223.1	5	3	. .	. . .	.	.	H.	
20	6 17	. .	.	.	. .	1.621	5	3	H.	

RESULTS OF MEASURES OF DOUBLE STARS.

Date.	Name of Star.	Approx. R. A.	Approx. N. P. D.	Position Angle.	Number of measures.	Distance.	Number of measures.	Observer.	Remarks.
1875.		h. m.	° ′	°		″			
Dec. 22	Σ 19	0 10.3	54 6	126.5	4	2.43	4	H.	
23				127.6	4	2.66	4	H.	
22	Σ 23	0 11.3	90 23	350.8	4	8.76	4	H.	
23				352.6	4	8.63	4	H.	
23	65 Piscium	0 43.0	63 0	112.0	4	4.67	4	H.	
27				113.6	4	4.51	4	H.	
23	36 Andromedæ . . .	0 48.3	67 3	3.1	4	1.39	3	H.	
27				0.4	4	1.27	4	H.	
27	Σ 138 A and B	1 30.0	83 0	34.1	4	1.51	4	H.	
27	Σ 138 $\frac{A+B}{2}$ and C . .	. . .	. .	62.3	4	22.50	2	H.	C is 14th mag.
20	γ^1 Andromedæ	1 54.7	48 24	62.4	3	10.51	3	H.	γ^2 not separated.
23				62.8	4	10.54	4	H.	γ^2 wedge-shaped.
27	107 Arietis (Br.) . . .	2 36.7	64 55	15.7	4	3.05	2	H.	
Oct. 29	(Burnham)	3 35.9	66 25	131.2	3	6.10	1	Hn.	Mags. 14, nearly equal.
Mar. 13	*Sirius* and companion .	6 39.6	106 33	55.1	9	11.81	4	Hn.	
13				57.0	5	11.68	4	N.	
17				56.6	6	12.20	3	Hn.	
18				56.9	2	. .	.	Hn.	
22				55.3	4	11.65	4	Hn.	
25				56.1	4	11.89	2	Hn.	
25				56.4	4	11.16	3	N.	
April 6				56.6	5	10.99	4	H.	
8		6 39.6	106 33	56.2	6	11.36	6	H.	
14				56.1	5	11.01	5	H.	
21				56.6	5	10.95	4	H.	
May 10	O Σ 248	12 18	83 22	Single	.	. .	.	H.	Star reddish.
12	O Σ 251	12 23	57 57	80° (est.)	.	Not divided	.	H.	
12				69	1	do.	.	Hn.	
12	*h* 521.	12 39	61 57	3.4	3	. .	.	Hn.	Mags. 7 and 14; *h* calls companion 20th magnitude.
12				2.9	3	32.78	2	H.	
13	O Σ 269	13 27	54 28	50° (est.)	.	. .	.	H.	Images bad.
13	Σ 1768	13 32	53 6	Single	.	. .	.	H.	* Companion not visible.
13	S. W. B. 115	13 40	79 31*	. .	.	. .	.	H.	
10	O Σ 270	13 42	71 57	350.9	5	9.43	5	H.	Mags. 5 and 14.
27	*h* 5489	14 45	60 53	207.6	4	55.78	2	H.	Mags. 6 and 16. There is nothing in *h's* place.
28	2 Serpentis	14 55	89 39	15° (est.)*	.	. .	.	H.	* With power of 400; with 600 A no trace of duplicity.
June 23		14 54.3	87 18	213.6	4	5.85	2	Hn.	Small stars, 12–13 magnitude.
May 28	Σ 3091	15 10	94 26	249.4	3	12.73	3	H.	Not a close double star but two companions, one in P = 270, △ = 30″ (est.), and the other 14th magnitude. (See measures).
27	276 Serpentis	15 15	88 51	14.8	4	. .	.	H.	Mags. 4.5 and 10. Star reddish.
28	W. XV, 716	15 32	49 47*	. .	.	. .	.	H.	* Star oblong.
27	Σ 1967	15 38	63 19†	. .	.	. .	.	H.	† No trace of duplicity.
28	*v Scorpii*	16 5	109 9	42.2	3	2.61	3	H.	
June 10	Σ 2032 = σ Coronæ, A and B	16 10	55 50	198.9	4	3.40	2	Hn.	Magnitudes 5 and 6; also a companion 12 magnitude in *p* = 40° *at greater* distance.
10	σ Coronæ, A and C . . .	. .	. .	226.2	2	14.68	1	Hn.	Magnitudes 5 and 15.
Sept. 3	μ^1 *Herculis*, B and C . .	17 42	62 12	218.4	4	1.27	3	H.	
6	μ^2 *Herculis*, A and $\frac{B+C}{2}$.	. .	. .	244.1	4	31.13	4	H.	
7	μ^1 *Herculis*, B and C . .	. .	. .	219.1	4	1.24	4	H.	
8	μ^1 *Herculis*, B and C . .	. .	. .	222.2	4	1.03	3	H	
8				225.9	4	. .	.	N.	The north star the smaller.
9				220.5	4	. .	.	H.	
14				223.0	4	. .	.	H.	
14				217.6	5	. .	.	Hn.	
July 29	Triple star in Trifid Nebulæ, B and D.	17 55	113 2	283.4	4	2.40	2	Hn.	
Aug. 5	A and B	. .	. .	210.7	4	. .	.	Hn.	
5	A and C	. .	. .	22.7	3	. .	.	Hn.	
5	B and E	. .	. .	192.6	3	. .	.	Hn.	E. magnitude 15.
5	A and H	. .	. .	106.7	3	19.50	2	Hn.	

RESULTS OF MEASURES OF DOUBLE STARS—Continued.

Date.	Name of Star.	Approx. R. A.	Approx. N. P. D.	Position angle.	Number of measures.	Distance.	Number of measures.	Observer.	Remarks.
1875.		h. m.	° ′	°		″			
Sept. 8	A and B	. .	. .	. .	.	10.75	2	Hn.	
8	A and C	. .	. .	. .	.	6.49	2	Hn.	
8	B and E	. .	. .	. .	.	5.80	2	Hn.	
19	α^2 *Capricorni*	20 11	102 56	245.2	4	1.14	1	H.	
Oct. 4	α^1 *Capricorni*, A to C . .	. .	. .	181.8	3	40 (est.)	.	Hn.	Magnitudes 3 and 16.
Dec. 2	B. A. C. 920 (S. W. B.). .	21 1	68 52	64.4	3	. .	.	H.	Not B. A. C. 920.
Nov. 25	Anonymous	21 32.1	106 1	125.0	3	2.17	2	H.	Star 8–9th mag., companion 13th mag.
Sept. 19	34 *Pegasi*	22 14	84 49	225.9	4	2.56	2	H.	
20	30 *Pegasi*, A and B . .	. .	. .	21.0	4	6.23	2	H.	
20	30 *Pegasi*, A and C . .	. .	. .	221.2	4	9.70	2	H.	
Oct. 27	A and B	. .	. .	18.5	4	. .	.	H.	
27	A and C	. .	. .	219.0	4	. .	.	H.	
20	A and B	. .	. .	17.6	4	6.38	4	H.	
20	A and C	. .	. .	221.8	4	9.91	4	H.	
29	34 *Pegasi*	. .	. .	220.7	4	2.66	2	H.	
Nov. 27	ζ *Aquarii*	22 22.4	90 40	337.4	4	4.11	2	H.	Diffuse images; very bad seeing.
Dec. 2		. .	. .	331.8	4	3.61	3	H	
20		. .	. .	333.9	5	3.91	2	H	
22		. .	. .	332.0	4	3.84	4	H.	

LIST OF CORRECTIONS TO OBSERVATIONS PUBLISHED IN THE ASTRONOMISCHE NACHRICHTEN.

A. N. No. 2061, Band 86, col. 21.

April 6. OBERON; 127°.0 for 127°.3.
May 6. UMBRIEL; $\Delta\delta$ $2^r.005 = 19''.95$ for $2^r.011 = 20''.01$.
Feb. 1. ARIEL; 196°.1 for 196°.6.
Mar. 22. ARIEL; $1^r.246 = 12''.40$ for $1^r.243 = 12'37$.
May 25. TITANIA; 10°.7 for 20°.7.

A. N. No. 2076, Band 87, col. 77.

July 24. JAPETUS: $\Delta\delta$; 7.57 for 7.37.
27. JAPETUS: $\Delta\delta$; 4.71 for 4.51.
Oct. 5. Number of comparisons of $\Delta\alpha$; 36 for 30.
July 29. HYPERION; $\delta\Delta = -39.76$ for 39.71.
Sept. 7. $9^h\ 9^m$ W. M. T for $9^h\ 10^m$.
July 12. TITAN; $\Delta\alpha = +10.451$ for 10.450.
27. TITAN; $\Delta\delta - 21.58$ for 31.52.
29. TITAN; $14^h\ 6^m$ for 14–16 in time of $\Delta\delta$.
June 24. RHEA; $p = 47.9$ for 47.8.
July 12 RHEA $\Delta\delta$; 17″.44 for 17″.46.
Sept. 3. DIONE; $9^h\ 37^m$ for $9^h\ 39^m$ in time of $\Delta\alpha$.
Aug. 8. DIONE; 33°.0 for 33°.3.
July 12. DIONE; 52″.83 for 52″.85.
Aug. 26. ENCELADUS; should be entered as an observation of RHEA.
5. ENCELADUS; $\Delta\delta$ 19″.71 for 20″.08.
For MIMAS read ENCELADUS.

MISCELLANEOUS OBSERVATIONS IN 1875.

I. OCCULTATIONS OF STARS BY THE MOON.
II. OBSERVATIONS OF THE PHENOMENA OF THE SATELLITES OF JUPITER.
III. OBSERVATIONS OF ECLIPSE OF SEPTEMBER 28, 1875.

I.—OCCULTATIONS OF STARS BY THE MOON.

Date.	Object.	Magnitude.	Phase.	Observer.	Chronometer Time.	Chron. Corr.	Washington Mean Time.	Weight.	Aperture.	Power.	Remarks.
1875.					h. m. s.	s.	h. m. s.		in.		
May 20	α Scorpii . . .	1.2	Emersion	N.	9 25 49	−140.9	9 23 28.1	.	9.62	. .	One or two seconds late, and a small probability of being several seconds late.
Aug. 13	B. A. C. 6628 .	6	Immersion	T.	12 15 43.5	− 17.9	12 15 25.6	3	9.62	132	Moon $2^{d}.8$ before full.
Sept. 10	A Sagittarii . .	5	Immersion	T.	12 31 30.9	− 16.9	12 31 14.0	5	9.62	132	Unusually sharp. Moon $4^{d}.3$ before full.
Sept. 14	χ Aquarii. . .	5½	Immersion	T.	6 27 17.3	− 10.0	6 27 7.3	4	9.62	132	Moon $0^{d}.5$ before full.
14	χ Aquarii. . .	5½	Emersion	T.	7 23 4.0	− 10.0	7 22 54.0	4	9.62	132	Moon $0^{d}.5$ before full.
Oct. 3	A² Scorpii . .	5	Immersion	T.	6 21 5.9	+ 16.7	6 21 22.6	5	9.62	132	Very sharp. Moon $3^{d}.7$ before first quarter.
3	3 Scorpii . . .	6	Immersion	T.	7 1 32	+ 16.8	7 1 48.8	5	9.62	132	Very sharp. Moon $3^{d}.7$ before first quarter.
20	ω¹ Cancri . . .	6	Emersion	T.	17 4 46.0	− 3.3	17 4 42.7	1	9.62	132	Moon $0^{d}.2$ before last quarter.
Nov. 16	c Geminorum .	6	Immersion	T.	18 6 55	− 3.5	18 6 51.5	2	9.62	132	Moon $2^{d}.5$ before last quarter.

NOTES.

Observers: N., Professor SIMON NEWCOMB.
T., Mr. D. P. TODD.

The weights are assigned on the following scale:—

1. Very uncertain.
2. Indifferent.
3. Average.
4. Good.
5. Excellent.

II.—OBSERVATIONS OF PHENOMENA

Date.	Number.	Satellite.	Phenomenon.	Phase.	Washington Mean Time.			Weight.
1875.					h.	m.	s.	
Jan. 14	1	I	Eclipse disappearance		16	34	10.5	.
Feb. 22	2	I	Eclipse disappearance		14	57	21.5	.
Mar. 17	3	I	Eclipse disappearance		15	5	6.8	.
April 5	4	III	Eclipse disappearance		8	0	49.0	.
5	5	III	Occultation reappearance	Interior contact	10	51	44	3
				Exterior contact	11	6	12	3
20	6	I	Eclipse reappearance		8	12	57.7	2
May 4	7	I	Eclipse reappearance		12	0	20.4	2
July 14	8	II	Transit egress	Interior contact	8	3	20	4
				Exterior contact	8	9	10	4
14	9	II	Shadow ingress	Exterior contact	8	11	26	2
				Interior contact	8	14	36	4
14	10	III	Occultation disappearance	Exterior contact	10	15	22	4
				Interior contact	10	26	53	4
14	11	II	Shadow egress	Interior contact	10	18	40	2
Aug. 5	12	I	Shadow ingress	Exterior contact	7	57	58	3
				Interior contact	8	1	53	3
5	13	I	Transit egress	Interior contact	8	56	21	2
				Exterior contact	9	0	52	2
6	14	I	Eclipse reappearance		7	17	47.7	4
6	15	I	Eclipse reappearance	First seen	7	18	6.9	1
21	16	I	Shadow ingress	Interior contact	6	22	50	2
21	17	I	Transit egress	Interior contact	7	19	44	4
				Exterior contact	7	26	4	4
21	18	I	Shadow egress	Interior contact	8	22	3	2
29	19	I	Eclipse reappearance	First seen	7	30	46.6	1
30	20	III	Shadow egress	Interior contact	7	26	33	2
Sept. 6	21	I	Shadow egress	Exterior contact	6	47	23	2
6	22	III	Transit egress	Interior contact	7	45	7	2
9	23	II	Shadow egress	Exterior contact	7	29	12	1
24	24	III	Occultation reappearance	Interior contact	6	55	15	1
29	25	I	Transit egress	Interior contact	6	24	25	1
				Exterior contact	6	28	23	1
Dec. 15	26	III	Shadow ingress	Interior contact	17	17	47	2
15	27	III	Shadow egress	Interior contact	18	39	7	3
				Centre contact	18	46	7	3
17	28	II	Transit ingress	Exterior contact	18	32	57	3
				Interior contact	18	39	2	3
17	29	II	Shadow egress	Interior contact	19	35	42	2
18	30	I	Eclipse disappearance	Last seen	17	22	2.4	3

NOTES.

The column "Weight": 1, Uncertain; 2, Indifferent; 3, Average; 4, Good; 5, Excellent.

The column "Observer": N., Professor Newcomb; Hn., Professor Holden; Tu., Mr. H. P. Tuttle; T., Mr. D. P. Todd.

OF THE SATELLITES OF JUPITER.

Number.	Amer. Ephem., Washington Mean Time.			Appar'nt corr. to Ephemeris.		Observer.	Aperture of Instrument.	Magnifying power.	Remarks.
	h.	m.	s.	m.	s.		in.		
1	16	33	46.6	+ 0	23.9	Tu.	9.62	. .	Plus or minus 10s.
2	14	56	37.8	+ 0	43.7	Hn.	26.0	. .	Seen by glimpses 10s after the recorded time.
3	15	4	58.0	+ 0	8.8	Hn.	26.0	. .	The satellite was [certainly] visible 20s earlier.
4	7	58	14.6	+ 2	34.4	N.	9.62	132	Jupiter very near the horizon, and satellite very near the planet. Undulations considerable. Satellite disappeared occasionally before recorded time, which was the last moment when it was certainly and distinctly seen.
5	10	59		. . .		T.	9.62	132	Definition steady. At 2m 39s, a broad indentation in the disk at the point of contact.
6	8	12	41.8	+ 0	15.9	Hn.	26.0	. .	
7	12	0	30.8	− 0	10.4	Hn.	26.0	. .	
8	8	4		. . .		T.	9.62	132	
9	8	8		. . .		T.	9.62	132	At the time recorded "exterior contact," the edge of the shadow had advanced a few seconds on the disk.
10	10	16		. . .		T.	9.62	132	
11	10	38		. . .		T.	9.62	132	
12	7	58		. . .		T.	9.62	132	
13	8	59		. . .		T.	9.62	132	Considerable atmospheric disturbance.
14	7	17	17.0	+ 0	30.7	Hn.	26.0	400	Planet in haze, and eclipse observed between clouds.
15	7	17	17.0	+ 0	49.9	T.	9.62	132	At the time recorded, the planet was just reappearing from passing clouds, and the satellite had attained one-third its full brightness. Sky a little hazy. Twilight strong.
16	6	17		. . .		T.	9.62	132	Contact observed with tolerable accuracy, though the sun was still above the horizon, and the planet was very pale.
17	7	25		. . .		T.	9.62	132	
18	8	29		. . .		T.	9.62	132	Planet low; limb undulating.
19	7	29	53.9	+ 0	52.7	T.	9.62	202	Planet at a low altitude, and twilight not entirely gone.
20	7	27		. . .		T.	9.62	202	Planet low; limb undulating. Observation uncertain by probably little less than a minute.
21	6	47		. . .		T.	9.62	132	Limb of the planet undulating. Observation of contact uncertain by fully 20s.
22	7	59		. . .		T.	9.62	132	Planet very near the horizon.
23	7	19		. . .		T.	9.62	132	This observation was perhaps late, as the shadow was quite indistinct during egress, and the altitude of the planet was only a few degrees.
24	6	58		. . .		T.	9.62	132	Planet very low; uncertainty amounting to about two minutes.
25	6	25		. . .		T.	9.62	132	
26	17	1		. . .		T.	5.0	160±	
27	18	58		. . .		T.	5.0	160±	
28	18	31		. . .		T.	26.0	400	
29	19	41		. . .		T.	26.0	400	
30	17	22	2.5	− 0	0.1	T.	5.0	160±	Moon at quarter and 57° from Jupiter.

NOTES.

The column "Aperture of Instrument": 26in.0, the Great Equatorial, 389in.8 focus, constructed by ALVAN CLARK & SONS.
9in.62, the Old Equatorial, 172in.5 focus, constructed by MERZ & MAHLER.
5in.0, one of the Transit-of-Venus Equatorials, 72 inches focus, ALVAN CLARK & SONS, No. 860.

III.—OBSERVATIONS OF THE SOLAR ECLIPSE, SEPTEMBER 28, 1875.

Instrument: 9.62 inch Equatorial; full aperture; power, 132. HALL, observer; PAUL, recorder. Chronometer, NEGUS 718.

Kessels clock, 7^h 8^m 0^s; correction — 35^s.6.
Negus 718, 11^h 36^m 15^s.6; correction — 5^h 0^m 10^s.3.

End of eclipse, 12^h 4^m 55^s.0 ± 5^s by chronometer. Sky hazy, and observed time doubtful.

Kessels clock, 7^h 43^m 0^s; correction — 35^s.6.
Negus 718, 12^h 11^m 9^s.8; correction — 5^h 0^m 10^s.3.

End of eclipse, 19^h 4^m 44^s.7 ± 5^s Washington mean time.

Instrument: Comet-seeker; aperture 3.96 inches; power, 40. HOLDEN, observer; FRISBY, recorder. Chronometer, FRODSHAM 1828.

Kessels clock, 6^h 26^m 9^s; correction — 35^s.6.
Frodsham 1828, 17^h 54^m 15^s.5; correction + 5^s.6.

End of eclipse, 19^h 4^m 21^s.0 by chronometer. Uncertain by several seconds. Shade-glass not quite light enough for use through the clouds. Contact noted at 21^s, but seconds counted till 31^s, when limb was seen round without doubt.

End of eclipse, 19^h 4^m 26^s.6 ± 10^s, Washington mean time. HALL—HOLDEN = + 18^s.1 ± 11^s.2.

CORRECTIONS

TO THE

STAR-POSITIONS OF THE AMERICAN EPHEMERIS,

GIVEN BY

OBSERVATIONS WITH THE TRANSIT CIRCLE.

1875.

CORRECTIONS

TO THE

STAR-POSITIONS OF THE AMERICAN EPHEMERIS, ETC., 1875.

NOTE.—In order to obviate the necesstiy for reference to the American Ephemeris, immediately below the name of each star are given its mean right ascension and north polar distance for 1875.0, as given in that work.

α ANDROMEDÆ.

	h.	m.	s.
Right Ascension . . .	0	1	55.734
North-Polar Distance .	61°	35′	58″.32

1875.			s.	″
Feb.	5	F.	− 0.01	+ 1.2
	16	E.	+ 0.06	+ 2.1
	18	S.	+ 0.01	. .
	22	S.	− 0.05	+ 3.4
	26	S.	− 0.09	. .
Mar.	8	E.	− 0.03	+ 2.9
April	4	E.	+ 0.11	. .
	28	E.	− 0.03	+ 1.5
May	6	E.	− 0.04	+ 1.2
	27	E.	+ 0.02	+ 4.8
June	23	Sk.	+ 0.02	+ 1.6
	25	F.	− 0.14	+ 0.6
July	21	Sk.	− 0.07	+ 1.6
Sept.	4	P.	+ 0.05	+ 2.9
Oct.	2	E.	− 0.11	+ 2.5
	7	F.	− 0.04	+ 1.7
	12	F.	− 0.07	+ 2.3
	13	Sk.	− 0.05	+ 0.2
	20	P.	− 0.06	+ 2.2
	21	F.	+ 0.02	+ 0.3
	25	E.	− 0.09	+ 1.2
	27	E.	− 0.05	+ 2.9
	28	P.	− 0.06	+ 2.1
Nov.	2	P.	− 0.07	+ 1.3
	5	E.	0.00	+ 2.1
Dec.	23	Sk.	− 0.11	+ 2.1
	27	Sk.	− 0.09	+ 1.4
Mean			− 0.036	+ 1.92
Div., Flex., etc. .			. .	− 0.06

γ PEGASI.

	h.	m.	s.
Right Ascension . . .	0	6	48.032
North-Polar Distance .	74°	30′	40″.45

1875.			s.	″
Feb.	5	F.	− 0.07	+ 1.0
	16	E.	+ 0.02	+ 2.1
	22	S.	− 0.02	+ 3.4
	26	S.	+ 0.02	. .
April	28	E.	+ 0.07	+ 1.6
May	6	E.	+ 0.02	+ 2.3
	27	E.	+ 0.04	+ 3.8
	28	F.	− 0.03	+ 0.5
June	23	Sk.	0.00	+ 1.5
	25	F.	− 0.03	+ 1.3
Sept.	7	F.	+ 0.11	+ 1.1
	8	P.	+ 0.04	+ 1.3
	27	F.	. .	+ 1.6
Oct.	7	F.	. .	0.0
	12	F.	+ 0.08	+ 4.8
	13	Sk.	− 0.02	+ 1.6
	20	P.	− 0.02	+ 2.1
	21	F.	− 0.06	+ 1.5
	25	E.	− 0.03	+ 2.0
	27	E.	− 0.05	+ 2.9
	28	P.	0.00	+ 1.9
Nov.	2	P.	− 0.04	+ 1.3
	5	E.	+ 0.02	+ 0.6
	10	Sk.	+ 0.02	+ 2.5
	30	Sk.	− 0.03	+ 0.9
Dec.	23	Sk.	− 0.04	+ 1.1
	27	Sk.	− 0.11	+ 1.6
Mean			− 0.004	+ 1.79
Div., Flex., etc. .			. .	− 0.39

α CASSIOPEÆ.

	h.	m.	s.
Right Ascension . . .	0	33	25.506
North-Polar Distance .	34°	8′	54″.95

1875.			s.	″
May	6	E.	− 0.04	− 0.7
	10	E.	− 0.09	. .
Sept.	24	P.	− 0.05	+ 0.9
	27	F.	+ 0.03	0.0
Oct.	4	P.	. .	+ 1.7
	9	P.	− 0.16	+ 4.5
	22	P.	+ 0.06	+ 2.6
	28	P.	. .	+ 1.1
Nov.	6	Sk.	. .	+ 1.2
	10	Sk.	. .	+ 2.4
	12	P.	. .	+ 1.5
Dec.	20	P.	− 0.13	+ 1.9
	23	Sk.	− 0.08	+ 3.3
	27	Sk.	− 0.18	+ 2.6
Mean			− 0.071	+ 1.77
Div., Flex., etc. .			. .	− 1.06

α CASSIOPEÆ (Ref.).

1875.			s.	″
May	28	F.	. .	+ 2.7
Oct.	4	P.	. .	− 2.0
	9	P.	. .	− 0.3
	28	P.	. .	− 2.1
Nov.	6	Sk.	. .	− 2.4
	10	Sk.	. .	− 2.1
	12	P.	. .	− 2.9
Dec.	20	P.	. .	− 1.8
	23	Sk.	. .	− 2.0
	27	Sk.	. .	− 2.4
Mean			. .	− 1.53
Div., Flex., etc. .			. .	+ 1.58

β CETI.

	h.	m.	s.
Right Ascension . . .	0	37	18.807
North-Polar Distance .	108°	40′	22″.56

1875.			s.	″
Feb.	26	S.	+ 0.02	+ 1.0
April	28	E.	+ 0.19	+ 1.7
May	6	E.	+ 0.21	− 1.7
	12	Sk.	. .	− 1.3
	14	E.	+ 0.15	+ 1.6
June	23	Sk.	+ 0.10	+ 2.5
	25	F.	+ 0.13	− 0.1
Aug.	13	P.	+ 0.01	+ 1.4
Sept.	3	F.	+ 0.01	+ 2.3
	4	P.	+ 0.13	+ 2.0
	7	F.	+ 0.04	+ 1.9
	8	P.	+ 0.17	+ 0.9
	24	P.	0.00	+ 0.6
Oct.	4	P	+ 0.04	+ 1.2
	5	Sk.	− 0.07	+ 0.6
	7	F.	+ 0.04	+ 1.1
	12	F.	+ 0.09	+ 1.5
	21	F.	+ 0.12	+ 1.1
	22	P.	+ 0.13	+ 0.6
	25	E.	+ 0.04	+ 0.7
	28	P.	. .	+ 1.7
Nov.	2	P.	+ 0.04	+ 2.1
	8	F.	+ 0.10	+ 0.7
	11	D.	. .	+ 2.2
	17	P.	+ 0.03	+ 0.1
	22	Sk.	+ 0.02	+ 0.1
	24	F.	+ 0.06	+ 1.0
	30	Sk.	− 0.05	+ 0.7
Dec.	10	Sk.	0.00	− 0.2
Mean			+ 0.067	+ 0.97
Div., Flex., etc. .			. .	− 0.08

21 CASSIOPEÆ.

	h.	m.	s.
Right Ascension . . .	0	37	25.527
North-Polar Distance .	15°	41′	46″.24

1875.			s.	″
Nov.	27	F.	+ 0.24	− 1.7
Dec.	2	F.	+ 0.15	− 0.5
	18	F.	+ 0.05	+ 0.3
	20	P.	+ 0.15	− 1.3
Mean			+ 0.148	− 0.80
Div., Flex., etc. .			. .	− 1.23

21 CASSIOPEÆ, S. P.

	h.	m.	s.
Right Ascension . . .	0	37	25.527
North-Polar Distance .	344°	18′	13″.76

1875.			s.	″
April	5	E.	+ 0.42	+ 3.4
May	27	E.	+ 0.40	+ 3.9
	28	F.	+ 0.01	+ 3.5
	31	E.	+ 0.23	+ 3.3
Mean			+ 0.265	+ 3.52
Div., Flex., etc. .			. .	− 1.34

ε PISCIUM.

	h.	m.	s.
Right Ascension . . .	0	56	27.423
	°	′	″
North-Polar Distance .	82	46	59.53

1875.				s.		″
July	23	F.	+	0.05	+	3.7
Sept.	3	F.	—	0.09	+	1.5
	7	F.	+	0.03	+	0.7
Oct.	4	P.		0.00	+	0.4
	12	F.	+	0.05	—	0.3
	22	P.		0.00	+	1.0
	25	E.	—	0.03	+	0.4
Nov.	2	P.	—	0.04		. .
	4	F.	+	0.12	+	0.2
	6	Sk.	+	0.02	+	2.2
	8	F.	—	0.04	+	0.8
	10	Sk.		0.00	+	1.7
	11	D.		. .	+	2.1
	12	P.		. .	+	3.6
	15	D.		. .	+	1.6
	17	P.	—	0.05	+	1.6
	27	F.	+	0.01	+	1.3
Dec.	2	F.	—	0.07	+	0.8
	17	E.	—	0.08	+	2.0
	18	F.	+	0.18		. .
	20	P.	+	0.06	+	1.5
Mean			+	0.007	+	1.41
Div., Flex., etc. .				. .	—	0.27

ε PISCIUM (Ref.).

1875.				s.		″
Nov.	12	P.		. .	+	1.4
Div., Flex., etc. .				. .	+	0.89

POLARIS.

	h.	m.	s.
Right Ascension . . .	1	13	0.165
	°	′	″
North-Polar Distance .	1	21	26.19

1875.				s.		″
Jan.	11	E.		. .	+	0.6
	14	Sk.	+	0.39	—	0.7
	15	E.	—	1.12 δ	+	2.9
Feb.	22	S.	+	0.86	+	3.6
	26	S.	—	2.76_{51} δ	+	0.5
Mar.	4	E.	+	1.13_{51} δ	+	2.6
	8	E.	+	0.91_{51} δ	+	3.1
	10	F.	—	2.12 λ	+	0.5
	11	Sk.		. .	+	2.7
	12	E.	+	0.99 λ	+	0.1
	16	E.	+	0.45 λ	+	1.9
	17	F.	+	0.01 λ	+	1.9
	23	Sk.		. .	+	2.1
	25	F.		. .	+	1.9
	27	Sk.	+	1.19 δ		. .
April	5	E.	+	0.93	+	1.4
	7	F.	+	1.55		. .
	20	E.	—	0.17	+	1.8
	28	E.	+	2.02	+	0.9
	29	F.	—	1.10		. .
May	6	E.	+	1.36	—	0.2
	10	E.	+	3.34		. .
	12	Sk.	+	1.02		0.0
	14	E.		. .	+	1.5
	16	F.	+	1.88	+	0.3
	18	E.	+	1.84	+	0.7
	21	Sk.	+	2.30 δ_{51}		. .
	25	Sk.	+	1.10 λ		. .
	26	E.	+	3.04		. .
	28	F.	—	1.38	+	1.0
	30	Sk.		. .	—	1.4
	30	E.	—	1.14	—	1.2
	31	F.		. .	+	0.1
June	23	Sk.	—	0.65	—	0.2
	25	F.		. .	+	0.8
	27	Sk.		. .	+	2.0
July	21	Sk.		. .	+	1.6
	23	F.		. .	+	0.5
	25	Sk.		. .	+	1.2

POLARIS—Continued.

1875.				s.		″
Aug.	13	P.		. .	+	1.9
	20	P.	—	2.26_{51}	+	2.1
	21	P.	+	0.43 δ_{51} λ	+	0.6
Sept.	3	F.	+	1.04	+	0.5
	4	P.	—	3.09	+	2.0
	7	F.	+	1.29	—	0.1
	8	P.	—	4.13		0.0
	14	P.	—	1.40 λ	+	0.8
	24	P.	—	1.80	+	0.4
	27	F.	+	0.57	+	2.4
Oct.	4	P.		. .	+	0.4
	5	Sk.	—	2.20		. .
	7	F.	—	0.08 λ	+	0.2
	9	P.	—	2.69		. .
	12	F.	—	1.48 λ	—	0.5
	16	P.	—	0.60 δ	+	3.8
	20	P.	—	2.50	+	0.4
	21	F.	—	0.69 λ	+	0.7
	22	P.		. .	+	1.3
	25	Sk.	—	5.12		. .
	25	E.	—	0.67	—	0.4
	27	F.	—	3.68	+	2.9
	28	P.	—	1.29	+	0.3
	29	Sk.		. .	—	0.6
Nov.	2	P.	—	1.69	+	0.4
	4	F.		. .	+	0.8
	5	P.		. .	+	1.1
	6	Sk.	—	1.04		0.0
	10	Sk.		. .	+	1.2
	11	E.	—	0.56	+	1.1
	11	D.		. .	+	2.4
	12	P.	—	2.50	+	1.1
	15	D.		. .	+	0.2
	15	E.		. .	+	0.9
	17	P.	—	2.12	+	2.8
	22	Sk.	—	0.68	+	1.0
	24	F.		. .	—	0.2
	27	F.		. .	—	0.4
	30	Sk.		. .	+	0.6
Dec.	2	F.		. .	—	0.1
	10	Sk.		. .	+	1.0
	17	E.		. .	+	3.5
	18	F.		. .	+	2.2
	20	P.	—	2.08	+	1.2
	22	F.	—	2.57	+	2.0
	23	Sk.		. .	+	0.6
	27	Sk.		. .	+	1.7
Mean				. .	+	1.05
Div., Flex., etc. .				. .	—	1.11

POLARIS (Ref.).

1875.				s.		″
Oct.	4	P.		. .	—	0.6
Div., Flex., etc. .				. .	+	1.81

POLARIS, S. P.

	h.	m.	s.
Right Ascension . . .	1	13	0.165
	°	′	″
North-Polar Distance .	358	38	33.81

1875.				s.		″
Feb.	22	S.	+	0.97	+	1.7
April	5	E.	+	1.30	+	2.0
	7	F.	+	1.61	+	3.2
	20	Sk.		. .	+	0.1
	21	E.	—	0.10	+	2.4
	22	F.		. .	—	1.0
	29	E.	+	2.00		. .
	30	F.	—	1.02		. .
May	4	F.		. .	+	1.0
	7	E.	+	1.50	+	2.6
	10	Sk.		. .	+	2.5
	11	E.	+	3.64	+	(5.4)
	13	Sk.	+	1.23	+	2.4
	17	F.	+	2.45	—	0.2
	19	E.	+	1.88	+	2.3
	27	E.	+	3.02	+	1.6
	28	F.	—	0.99	+	0.6
	31	E.	—	1.09	+	1.7

POLARIS, S. P.—Continued.

1875.				s.		″
June	4	E.		. .	+	1.6
	9	F.		. .	+	1.6
	11	Sk.		. .	+	1.0
	16	E.		. .	+	1.3
	23	F.	—	0 18	+	1.8
July	8	E.		. .	+	0.2
Aug.	6	Sk		. .	+	0.5
	9	P.	—	1.68_{51} δ		. .
	26	Sk.	—	3.07_{51}	—	0.1
	30	P.		. .	+	1.4
Sept.	3	F.	+	0.62	—	1.1
	4	P.	—	3.03	—	0.2
	7	F.	+	1.83	—	1.0
	8	P.	—	4.18		. .
	11	F.		. .	+	2.1
	24	P.	—	2.30		0.0
	25	F.		. .	—	0.2
	27	F.		0.00	—	0.4
Oct.	2	E.	+	0.06_{51} δ	—	0.3
	5	Sk.	—	2.10		. .
	8	Sk.		. .	—	0.7
	9	P.	—	3.36		. .
	13	Sk.	—	4.54_{51} δ		. .
	19	P.	—	1.73		. .
	24	Sk.		. .		0.0
	25	E.	—	0.70	—	1.4
	26	F.	—	3.91		0.0
	27	P.	—	2.07		. .
	28	Sk.		. .	—	0.5
Nov.	1	P.	—	1.78		0.0
	5	Sk.	—	1.23	—	3.3
	8	P.		. .	—	0.4
	10	P.		. .	—	0.3
	10	E.	—	0.11	—	0.7
	11	P.	—	2.35	—	1.8
	12	F.		. .	+	0.9
	16	P.	—	1.94	—	0.5
	21	P.		. .	—	0.8
	21	Sk.	—	0.56		. .
Dec.	19	Sk.	—	1.65_{51}	+	1.1
	20	P.	—	2.19	+	1.2
	22	F.	—	2.47	—	0.1
Mean				. .	+	0.53
Div., Flex., etc. .				. .	—	1.10

POLARIS, S. P. (Ref.).

1875.				s.		″
Feb.	22	S.		. .	—	1.1
	22	S.		. .	—	0.4
Mean				. .	—	0.75
Div., Flex.. etc. .				. .	+	1.77

θ^1 CETI.

	h.	m.	s.
Right Ascension . . .	1	47	46.533
	°	′	″
North-Polar Distance .	108	49	42.96

1875.				s.		″
Jan.	11	E.	+	0.02	+	3.6
	14	Sk.	+	0.02	+	4.2
	15	E.	—	0.10	+	3.9
Mar.	11	Sk.	+	0.13		. .
May	28	F.	+	0.14	+	1.7
June	25	F.	+	0.09	+	2.8
	27	Sk.	+	0.04	+	3.0
July	21	Sk.	+	0.14	+	3.8
	23	F.	+	0.07	+	3.8
	25	Sk.	+	0.02	+	3.1
Sept.	3	F.	—	0.01	+	2.6
	8	P.	+	0.02	+	2.0
	14	P.		0.00	+	1.3
	24	P.		0.00	+	2.0
	27	F.	+	0.15	+	4.3
Oct.	4	P.	+	0.02	+	2.2
	5	Sk.	—	0.05	+	2.8
	7	F.	+	0.07	+	2.0
	22	P.	+	0.17	+	1.8

θ^1 CETI—Continued.

1875.			s.	″
Oct.	25	E.	0.00	+ 3.2
	28	P.	+ 0.04	+ 2.5
	29	Sk.	+ 0.02	+ 1.5
Nov.	2	P.	− 0.01	+ 3.0
	4	F.	+ 0.05	+ 1.2
	8	F.	+ 0.07	+ 1.6
	15	E.	+ 0.08	+ 3.2
Dec.	17	E.	0.00	+ 2.4
Mean			+ 0.044	+ 2.67
Div., Flex., etc. .			. .	− 0.08

38 CASSIOPEÆ.

	h.	m.	s.
Right Ascension . . .	1	21	57.413
North-Polar Distance .	20°	22′	47″.11

1875.			s.	″
Jan.	15	E.	− 0.01	+ 2.3
Dec.	2	F.	+ 0.24	+ 0.3
	17	E.	− 0.03	+ 2.4
Mean			+ 0.067	+ 1.67
Div., Flex., etc. .			. .	− 1.25

η PISCIUM.

	h.	m.	s.
Right Ascension . . .	1	24	47.722
North-Polar Distance .	75°	17′	56″.20

1875.			s.	″
Jan.	11	E.	+ 0.03	+ 3.4
	15	E.	+ 0.01	+ 2.6
Mar.	25	F.	+ 0.12	+ 3.9
May	31	F.	0.00	+ 1.2
July	23	F.	+ 0.07	+ 3.5
Sept.	27	F.	+ 0.10	+ 0.9
Oct.	25	E.	0.00	+ 1.2
	27	F.	+ 0.12	+ 1.9
Nov.	2	P.	+ 0.06	+ 2.1
	4	F.	+ 0.06	+ 1.0
	11	D.	. .	+ 1.9
	15	E.	+ 0.04	+ 3.8
	17	P.	+ 0.05	+ 1.8
	24	F.	+ 0.08	+ 1.2
	27	F.	. .	+ 0.7
Mean			+ 0.057	+ 2.07
Div., Flex., etc. .			. .	− 0.37

o PISCIUM.

	h.	m.	s.
Right Ascension . . .	1	38	47.721
North-Polar Distance .	81°	28′	19″.62

1875.			s.	″
Jan.	11	E.	− 0.02	+ 2.5
	15	E.	− 0.03	+ 2.5
May	30	Sk.	+ 0.01	. .
July	23	F.	− 0.04	. .
Aug.	20	P.	− 0.17	+ 2.5
	21	P.	− 0.01	+ 1.4
Sept.	27	F.	− 0.19	+ 0.7
Oct.	4	P.	− 0.04	+ 0.5
	20	P.	− 0.07	+ 1.0
Nov.	4	F.	− 0.09	+ 0.2
	5	P.	− 0.05	+ 1.1
	8	F.	. .	− 0.9
	11	D.	. .	− 0.2
	17	P.	− 0.07	− 0.2
	24	F.	− 0.10	+ 0.7
	27	F.	− 0.13	+ 0.4
Dec.	2	F.	− 0.11	+ 0.8
	20	P.	. .	+ 0.6
	22	F.	+ 0.14	. .
	23	Sk.	. .	− 0.9
Mean			− 0.061	+ 0.75
Div., Flex., etc. .			. .	− 0.35

o PISCIUM (Ref.).

1875.			s.	″
Nov.	8	F.	. .	+ 0.2
Dec.	20	P.	. .	+ 2.1
	23	Sk.	. .	+ 1.4
Mean			. .	+ 1.23
Div., Flex., etc. .			. .	+ 0.86

β ARIETIS.

	h.	m.	s.
Right Ascension . . .	1	47	44.238
North-Polar Distance .	69°	48′	12″.98

1875.			s.	″
Jan.	11	E.	+ 0.03	+ 5.0
	15	E.	+ 0.07	+ 4.0
Mar.	4	E.	+ 0.02	+ 1.9
	10	F.	+ 0.05	+ 2.0
	11	Sk.	+ 0.02	+ 5.8
	16	E.	− 0.04	. .
	17	F.	− 0.04	+ 1.4
	23	Sk.	+ 0.12	+ 3.3
	25	F.	+ 0.01	+ 2.9
May	10	E.	+ 0.16	− 0.1
	14	E.	− 0.04	. .
	18	E.	+ 0.08	. .
	30	Sk.	+ 0.04	− 0.4
June	27	Sk.	+ 0.02	+ 1.8
July	21	Sk.	− 0.01	+ 3.4
	23	F.	− 0.01	+ 1.9
	25	Sk.	+ 0.02	+ 3.2
Aug.	13	P.	+ 0.02	+ 2.2
	20	P.	+ 0.01	+ 3.9
	21	P.	0.00	+ 3.1
Sept.	4	P	+ 0.06	+ 2.5
	8	P.	− 0.07	+ 1.3
	14	P.	− 0.04	+ 1.5
	27	F.	0.00	+ 2.2
Oct.	4	P.	. .	+ 1.3
	20	P.	− 0.02	+ 2.7
	22	P.	− 0.08	+ 2.3
	29	Sk.	− 0.05	+ 2.0
Nov.	2	P.	− 0.04	+ 2.0
	4	F.	+ 0.01	− 0.1
	5	P.	− 0.03	+ 2.6
	8	F.	− 0.04	+ 1.6
	10	Sk.	− 0.01	+ 2.4
	11	E.	− 0.15	+ 1.9
	15	E.	0.00	+ 2.2
	17	P.	− 0.04	+ 1.4
Dec.	2	F.	− 0.06	+ 0.5
	10	Sk.	− 0.01	0.0
	13	E.	− 0.08	+ 2.6
	17	E.	. .	+ 0.9
	20	P.	+ 0.01	+ 2.5
	22	F.	+ 0.12	+ 2.7
	23	Sk.	− 0.01	+ 4.1
Mean			0.000	+ 2.21
Div., Flex., etc. .			. .	− 0.31

β ARIETIS (Ref.).

1875.			s.	″
Oct.	4	P.	. .	+ 0.4
Div., Flex., etc. .			. .	+ 0.67

50 CASSIOPEÆ.

	h.	m.	s.
Right Ascension . . .	1	52	47.871
North-Polar Distance .	18°	11′	7″.22

1875.			s.	″
Jan.	11	E.	− 0.11	+ 0.1
	14	Sk.	+ 0.11	− 0.1
	15	E.	. .	+ 1.1
Aug.	20	P.	+ 0.13	+ 1.1
Oct.	20	P.	+ 0.05	+ 0.2
	22	P.	− 0.04	+ 0.3
Dec.	13	E.	0.00	+ 0.8
Mean			+ 0.023	+ 0.50
Div., Flex., etc. .			. .	− 1.28

50 CASSIOPEÆ, S. P.

	h.	m.	s.
Right Ascension . . .	1	52	47.871
North-Polar Distance .	341°	48′	52″.78

1875.			s.	″
Feb.	22	S.	+ 0.31	+ 1.8
April	20	Sk.	− 0.10	0.0
May	31	E.	+ 0.05	+ 2.4
Mean			+ 0.087	+ 1.40
Div , Flex., etc. .			. .	− 1.26

α ARIETIS.

	h.	m.	s.
Right Ascension . .	2	0	7.793
North-Polar Distance .	67°	7′	46″.01

1875.			s.	″
Jan.	11	E.	+ 0.03	+ 2.3
	14	Sk.	+ 0.04	+ 2.2
	15	E.	− 0.16	+ 2.8
Mar.	10	F.	− 0.02	. .
	11	Sk.	− 0.03	+ 5.3
	12	E.	+ 0.01	+ 4.3
	17	F.	+ 0.08	+ 1.9
	23	Sk.	− 0.01	+ 3.1
	25	F.	− 0.03	+ 2.5
	27	Sk.	+ 0.11	+ 3.2
April	5	E.	+ 0.02	+ 2.9
May	10	E.	+ 0.13	+ 2.3
	14	E.	− 0.04	+ 3.1
	18	E.	+ 0.13	+ 1.3
	30	Sk.	− 0.06	. .
	31	F.	− 0.12	+ 2.3
June	3	E.	+ 0.05	+ 3.1
	27	Sk.	0.00	+ 0.8
July	23	F.	− 0.03	+ 3.0
	25	Sk.	+ 0.01	+ 2.0
Aug.	13	P.	+ 0.09	+ 2.2
	21	P.	0.00	+ 2.0
Sept.	4	P.	− 0.01	+ 2.1
	8	P.	− 0.04	+ 1.2
	14	P.	− 0.05	+ 1.2
	24	P.	− 0.03	− 2.7
	27	F.	+ 0.02	+ 1.8
Oct.	4	P.	+ 0.01	+ 2.2
	20	P.	− 0.08	+ 1.6
	22	P.	0.00	+ 1.6
Nov.	2	P.	− 0.06	+ 2.2
	4	F.	− 0.04	+ 1.1
	5	P.	− 0.07	+ 2.0
	10	Sk.	− 0.01	+ 1.8
	15	E.	+ 0.01	+ 1.9
	24	F.	− 0.05	+ 1.3
	27	F.	− 0.05	+ 0.7
	30	Sk.	− 0.10	− 0.4
Dec.	2	F.	. .	+ 1.1
	10	Sk.	− 0.02	− 0.9
	13	E.	− 0.02	+ 2.0
	17	E.	+ 0.04	+ 2.1
	20	P.	− 0.07	+ 2.5
	22	F.	− 0.01	+ 1.9
	23	Sk.	− 0.01	+ 2.2
	27	Sk.	− 0.02	+ 2.2
Mean			− 0.010	+ 1.94
Div., Flex., etc. .			. .	− 0.19

ξ^1 CETI.

	h.	m.	s.
Right Ascension . . .	2	6	22.511
North-Polar Distance .	81°	44′	26″.25

1875.			s.	″
Jan.	14	Sk.	+ 0.08	+ 0.4
	15	E.	− 0.05	+ 0.9
Nov.	2	P.	+ 0.02	+ 0.2
	5	E.	+ 0.04	+ 1.1
	11	D.	. .	+ 0.7

ξ^1 Ceti—Continued.

1875.				s.		″
Nov.	12	P.	+	0.05	+	0.9
	15	D.		. .	+	0.3
	27	F.	+	0.08	—	0.4
Dec.	13	E.	+	0.07	+	1.7
	18	F.	+	0.10	+	0.5
	20	P.	+	0.05	+	0.9
	22	F.	+	0.23	+	0.1
Mean			+	0.067	+	0.61
Div., Flex., etc. .				. .	—	0.34

ι Cassiopeæ.

	h.	m.	s.
Right Ascension . . .	2	18	47.354
North-Polar Distance .	23°	9′	41″.81

1875.				s.		″
Nov.	2	P.	+	0.17		0.0
Dec.	13	E.	+	0.12	+	1.6
	20	P.	+	0.30	—	0.3
	22	F.	+	0.12	+	2.8
	23	Sk.	+	0.25	+	1.4
	27	Sk.	+	0.33	+	0.2
Mean			+	0.215	+	0.95
Div., Flex., etc. .				. .	—	1.13

ι Cassiopeæ (Ref.).

1875.				s.		″
Dec.	20	P.		. .	—	2.7
	22	F.		. .	—	3.2
	23	Sk.		. .	—	3.9
	27	Sk.		. .	—	2.9
Mean				. .	—	3.18
Div., Flex., etc.				. .	+	1.84

ι Cassiopeæ, S. P.

	h.	m.	s.
Right Ascension . . .	2	18	47.354
North-Polar Distance .	336°	50′	18″.19

1875.				s.		″
June	16	E.	+	0.44	+	3.4
Div., Flex., etc.				. .	—	1.05

γ^2 Ceti.

	h.	m.	s.
Right Ascension . . .	2	36	49.498
North-Polar Distance .	87°	17′	31″.28

1875.				s.		″
Jan.	14	Sk.	+	0.03	+	0.3
	15	E.	+	0.03	+	3.5
Feb.	16	E.	+	0.04	+	0.8
June	3	E.	+	0.11	+	3.1
Oct.	16	P.	—	0.01	+	1.1
	20	P.	—	0.02	+	1.2
Nov.	2	P.	+	0.02	+	0.7
	5	E.	+	0.03	+	1.7
	6	Sk.	+	0.07	—	0.2
	8	F.	+	0.02	+	1.3
	10	Sk.	—	0.01	+	1.0
	17	P.	—	0.05	+	1.4
	27	F.	+	0.03	+	0.1
	30	Sk.	—	0.02	—	0.6
Dec.	2	F.	—	0.07	—	0.9
	13	E.	+	0.01	+	1.1
	17	D.		. .	+	2.1
	20	P.	+	0.02	+	1.0
	23	Sk.	+	0.04		. .
	27	Sk.	+	0.02	—	0.1
Mean			+	0.015	+	0.98
Div., Flex., etc. .				. .	—	0.06

α Ceti.

	h.	m.	s.
Right Ascension . . .	2	55	44.782
North-Polar Distance .	86°	24′	7″.07

1875.				s		″
Jan.	15	E.	—	0.01	—	0.7
Feb.	9	F.	+	0.08	+	0.1
	16	E.	—	0.01	+	2.0
	18	S.	—	0.01		. .
Mar.	27	Sk.	+	0.12	+	2.2
April	20	Sk.	—	0.03		. .
May	27	F.		. .	—	1.2
	30	E.	+	0.16	+	0.2
	31	F.	+	0.05	+	0.3
June	3	E.	+	0.05	+	3.2
	10	Sk.	+	0.06		. .
Oct.	4	P.		. .	+	1.9
	16	P.	+	0.03	+	1.1
	19	F.	+	0.12	+	0.6
	27	F.	+	0.05	—	0.1
Nov.	2	P.	—	0.05	+	0.7
	10	Sk.		. .	+	0.8
	17	P.	—	0.06	—	0.2
	27	F.	+	0.01	+	1.2
	30	Sk.	—	0.04	—	0.7
Dec.	2	F.	—	0.01	+	0.7
	13	E.	—	0.02	+	2.1
	17	E.	+	0.04	+	0.7
	18	F.	+	0.03	—	0.4
	20	P.		0.00	+	0.5
	23	Sk.	+	0.04	+	1.9
	27	Sk.	+	0.03	+	0.8
Mean			+	0.026	+	0.74
Div., Flex., etc. .				. .	—	0.07

48 Cephei.

	h.	m.	s.
Right Ascension . . .	3	4	31.964
North-Polar Distance . .	12°	43′	41″.79

1875.				s.		″
Oct.	20	P.	+	0.29	+	0.1
Nov.	15	E.	+	0.10	+	0.4
Dec.	13	E.	+	0.24	+	1.1
Mean			+	0.210	+	0.53
Div., Flex., etc. .				. .	—	1.20

ζ Arietis.

	h.	m.	s.
Right Ascension . . .	3	7	43.144
North-Polar Distance .	69°	25′	11″.83

1875.				s.		″
Jan.	15	E.	—	0.06	+	1.8
	16	F.	—	0.02	+	2.1
Feb.	13	F.	—	0.07	+	3.3
Oct.	4	P.	—	0.04	+	1.6
	27	F.	+	0.02	+	0.6
Nov.	8	F.	—	0.01	+	1.3
	27	F.	—	0.05	+	1.6
Dec.	17	D.		. .	+	6.6
Mean			—	0.033	+	2.36
Div., Flex., etc. .				. .	—	0.30

α Persei.

	h.	m.	s.
Right Ascension . . .	3	15	24.368
North-Polar Distance .	40°	35′	9″.06

1875.				s.		″
April	5	E.	+	0.09	+	0.8
	20	Sk.	+	0.05	+	1.5
	21	E.	+	0.17		. .

α Persei—Continued.

1875.				s.		″
May	27	F.	+	0.10	—	0.5
	30	E.	+	0.14	—	0.3
	31	F.	—	0.03	—	0.2
June	3	E.	(+	0.26)	+	1.7
Nov.	8	F.		0.00	—	1.8
Mean			+	0.074	+	0.17
Div., Flex., etc. .				. .	—	0.93

δ Persei.

	h.	m.	s.
Right Ascension . . .	3	34	1.771
North-Polar Distance .	42°	36′	51″.99

1875.				s.		″
Feb.	22	S.	+	0.10	—	0.2
	28	E.	+	0.30	+	1.1
April	5	E.	+	0.19	+	1.4
	14	F.		. .		. .
	20	Sk.	+	0.17	+	1.1
	21	E.		. .	—	1.3
May	27	F.	+	0.46	+	0.6
Oct.	4	P.	+	0.21	—	0.6
	19	F.	+	0.15	+	1.2
Dec.	2	F.	+	0.06	—	0.3
	17	E.	+	0.09	+	0.8
Mean			+	0.192	+	0.38
Div., Flex., etc. .				. .	—	0.90

η Tauri.

	h.	m.	s.
Right Ascension . . .	3	40	3.364
North-Polar Distance .	66°	16′	59″.06

1875.				s.		″
Jan.	11	E.	—	0.03	+	1.0
Feb.	9	F.	+	0.04	+	0.4
	13	F.	—	0.07	+	2.9
	16	E.	—	0.02	+	2.0
	22	S.	—	0.08		0.0
	26	S.	—	0.13	+	1.3
	27	Sk.	—	0.02	+	1.0
	28	E.	+	0.06	+	1.5
Mar.	12	E.		. .	+	3.8
April	5	E.		0.00	+	3.3
	14	F.	+	0.01	+	2.1
	20	Sk.	—	0.02	—	1.1
	21	E.		. .	+	1.6
May	6	Sk.	+	0.07	—	0.9
	31	F.	+	0.18		. .
June	16	F.	—	0.03	+	1.2
	20	F.	+	0.08	—	0.9
Oct.	4	P.	—	0.03	+	0.4
	25	Sk.		0.00	+	0.6
	27	F.		0.00	+	0.4
Nov.	8	F.	—	0.05	+	0.3
	10	Sk.	+	0.09	+	1.0
	11	E.	—	0.17	+	1.3
Dec.	2	F.	—	0.12	+	0.1
	10	Sk.	+	0.15	—	1.3
	13	E.	—	0.09	+	0.8
	17	E.	—	0.03	+	2.2
Mean			—	0.008	+	0.96
Div., Flex., etc. .				. .	—	0.17

ζ Persei.

	h.	m.	s.
Right Ascension . . .	3	46	16.654
North-Polar Distance .	58°	29′	22″.15

1875.				s.		″
Jan.	11	E.	—	0.02	+	1.4
	16	F.	—	0.05	+	0.5
Feb.	13	F.	—	0.04	+	3.1
	15	Sk.	—	0.12	+	0.8

ζ PERSEI—Continued.

1875.				s.		″
Feb.	16	E.	+	0.01	+	1.2
	22	S.	−	0.11	+	1.7
	27	Sk.	+	0.01	+	0.6
	28	E.	+	0.08	+	1.5
April	5	E.	+	0.02	+	2.0
	14	F.		0.00	+	1.4
	20	Sk.	+	0.07	−	0.6
	21	E.	−	0.06	+	1.3
	30	F.	−	0.05	+	0.2
June	16	F.	+	0.03	+	0.7
	18	Sk.	+	0.13		. .
Oct.	4	P.	−	0.02	+	0.2
	25	Sk.		0.00	+	0.2
	27	F.	−	0.03	+	0.8
	29	Sk.	−	0.13	−	0.2
Nov.	8	F.	−	0.05	−	0.5
	10	Sk.	−	0.05	+	0.8
	11	E.	−	0.12	+	0.7
Dec.	2	F.	−	0.06	−	0.6
	10	Sk.	−	0.05	−	1.2
	13	E.	+	0.05	+	0.5
	17	E.	+	0.05	+	1.5
	20	P.	−	0.10	+	1.4
Mean			−	0.023	+	0.75
Div., Flex., etc. .				. .	−	0.06

γ¹ ERIDANI.

	h.	m.	s.
Right Ascension. . . .	3	52	11.863
North-Polar Distance .	103°	51′	54″.66

1875.				s.		″
Jan.	11	E.	+	0.10	+	1.8
	16	F.	+	0.05	+	2.9
Feb.	9	F.	−	0.02	−	0.2
	15	Sk.	+	0.02	+	2.8
	16	E.		. .	+	2.3
	18	S.	+	0.02		. .
	22	S.	+	0.10	+	3.7
	28	E.	+	0.03	+	4.3
April	5	E.	+	0.08	+	3.7
	14	F.	+	0.14	+	4.0
	30	F.	(+	0.24)	+	0.7
June	16	F.	+	0.12	+	2.2
	20	F.	+	0.12		. .
Oct.	4	P.	+	0.09	+	1.1
	25	Sk.	+	0.24	+	3.8
	29	Sk.	−	0.04	+	1.3
Nov.	8	F.	−	0.03	+	1.0
	11	E.	−	0.04	+	3.0
Dec.	2	F.	−	0.01	+	1.2
	10	Sk.	−	0.07	−	0.8
	17	E.		0.00	+	3.0
Mean			+	0.047	+	2.20
Div., Flex., etc. .				. .	−	0.01

γ TAURI.

	h.	m.	s.
Right Ascension. . . .	4	12	40.870
North-Polar Distance .	74°	40′	32″.89

1875.				s.		″
Feb.	22	S.	+	0.03	+	3.1
Nov.	29	P.	(−	0.17)	+	1.6
Dec.	17	D.		. .	+	2.1
	27	Sk.		. .	+	0.6
Mean			+	0.030	+	1.85
Div., Flex., etc. .				. .	−	0.39

γ TAURI (Ref.).

1875.				s.		″
Dec.	27	Sk.		. .	+	2.0
Div., Flex., etc. . .				. .	+	0.68

ε TAURI.

	h.	m.	s.
Right Ascension. . . .	4	21	19.132
North-Polar Distance .	71°	5′	54″.31

1875.				s.		″
Jan.	22	Sk.	−	0.05	+	2.2
Feb.	4	E.	+	0.07	+	2.6
	5	F.	+	0.07	+	2.3
	11	Sk.		0.00	+	2.3
	17	F.	−	0.01		. .
	18	S.	−	0.05		. .
	26	S.	−	0.19	+	2.5
Oct.	19	F.	−	0.03	+	2.3
	21	Sk.	−	0.15	+	2.5
Nov.	2	P.	−	0.04	+	3.3
	5	P.		0.00	+	1.7
	10	Sk.	+	0.02	+	2.8
Dec.	10	Sk.	+	0.08	+	0.3
	12	P.	−	0.02	+	2.3
Mean			−	0.021	+	2.26
Div., Flex., etc. .				. .	−	0.33

α TAURI.

	h.	m.	s.
Right Ascension. . . .	4	28	44.971
North-Polar Distance .	73°	44′	37″.05

1875.				s.		″
Feb.	4	E.	−	0.03	+	3.4
	11	Sk.	+	0.03	+	3.2
	13	F.	−	0.03	+	2.8
	17	F.	−	0.07		. .
	18	S.	−	0.01		. .
	26	S.	−	0.17	+	2.5
April	21	E.	−	0.03	+	2.5
	30	F.	−	0.04	+	2.2
May	6	Sk.	−	0.03	+	3.7
	13	Sk.	−	0.02	+	1.4
	17	F.	−	0.03	+	0.2
June	10	Sk.	−	0.03	+	4.6
	16	F.	−	0.08	+	4.2
	18	Sk.	−	0.04		. .
	22	Sk.	+	0.02	+	1.9
Oct.	4	P.		. .	+	1.7
	21	Sk.		0.00	+	2.0
	28	P.	−	0.07	+	1.7
Nov.	2	P.	−	0.10	+	3.0
	5	P.	−	0.07	+	1.8
	10	Sk.	−	0.08	+	2.2
	30	Sk.	−	0.07	+	1.0
Dec.	10	Sk.	+	0.02	+	0.2
	12	P.	−	0.07	+	1.7
Mean			−	0.043	+	2.28
Div., Flex., etc. .				. .	−	0.39

α TAURI (Ref.).

1875.				s.		″
Oct.	4	P.		. .	+	0.8
Div., Flex., etc. .				. .	+	0.67

9 CAMELOPARDALIS.

	h.	m.	s.
Right Ascension. . . .	4	41	38.012
North-Polar Distance .	23°	52′	22″.70

1875.				s.		″
Feb.	28	E.	+	0.09	+	3.5
Oct.	4	P.		. .	+	0.5
Dec.	12	P.		0.00	+	1.2
	19	Sk.		0.00		. .
	22	F.	+	0.13	−	0.2
Mean			+	0.055	+	1.25
Div., Flex., etc. .				. .	−	1.10

9 CAMELOPARDALIS (Ref.).

1875.				s.		″
Oct.	4	P.		. .	+	0.1
Dec.	22	F.		. .		0.0
Mean				. .	+	0.05
Div., Flex., etc. .				. .	+	1.81

9 CAMELOPARDALIS, S. P.

	h.	m.	s.
Right Ascension. . . .	4	41	38.012
North-Polar Distance .	336°	7′	37″.30

1875.				s.		″
Aug.	9	P.	+	0.20	−	0.1
Div., Flex., etc. .				. .	−	1.03

ι AURIGÆ.

	h.	m.	s.
Right Ascension. . . .	4	48	51.303
North-Polar Distance .	57°	2′	1″.91

1875.				s.		″
Jan.	22	Sk.	+	0.01	+	1.5
Feb.	4	E.	−	0.01	+	2.5
	5	F.	−	0.09	+	0.9
	17	F.	−	0.07		. .
	26	S.	−	0.08	+	0.9
April	21	E.	−	0.03	+	1.9
May	6	Sk.	−	0.09		. .
	7	E.	−	0.02	−	0.4
June	16	F.	+	0.07	+	4.0
	22	Sk.	(+	0.23)		. .
July	7	E.	+	0.01	+	0.3
Oct.	17	Sk.	−	0.05	+	1.5
	19	F.	−	0.04	+	1.2
	28	P.	−	0.11	+	1.2
Nov.	2	P.	−	0.09	+	1.4
	5	P.	−	0.01	+	0.2
	10	Sk.	−	0.01	+	1.0
	14	Sk.	−	0.08	+	2.2
	29	P.	−	0.07	+	1.5
	30	Sk.	−	0.02	+	0.8
Dec.	12	P.	−	0.05	+	1.1
	17	E.	+	0.07	+	2.0
	19	Sk.	−	0.06	+	1.8
	22	F.	−	0.05	+	1.5
Mean			−	0.038	+	1.38
Div., Flex., etc. .				. .	+	0.02

11 ORIONIS.

	h.	m.	s.
Right Ascension. . . .	4	57	25.698
North-Polar Distance .	74°	46′	18″.23

1875.				s.		″
Feb.	5	F.	−	0.07	+	1.3
	13	F.	−	0.09	+	2.9
Mean			−	0.080	+	2.10
Div., Flex., etc. .				. .	−	0.38

α AURIGÆ.

	h.	m.	s.
Right Ascension. . . .	5	7	27.443
North-Polar Distance .	44°	7′	54″.24

1875.				s.		″
Feb.	1	F.		. .	+	0.5
May	17	F.	−	0.08	+	0.3
June	16	F.	+	0.06		. .
	20	F.	+	0.14	+	0.5
	28	F.	−	0.15	+	1.9
July	7	E.	+	0.11	−	3.7
Mean			+	0.016	−	0.10
Div., Flex., etc. .				. .	−	0.88

β ORIONIS.

	h.	m.	s.
Right Ascension . . .	5	8	31.860
	°	′	″
North-Polar Distance .	108	20	51.52

1875.			s.	″
Feb.	1	F.	. .	+ 2.5
	5	F.	0.00	+ 0.2
	15	Sk.	+ 0.01	+ 2.5
	28	E.	− 0.02	+ 4.1
Mar.	4	E.	+ 0.02	+ 3.4
	8	E.	0.00	+ 4.0
	13	F.	+ 0.02	+ 1.9
April	30	F.	. .	+ 1.7
May	13	Sk.	+ 0.08	+ 2.2
	17	F.	+ 0.02	− 2.3
	28	F.	+ 0.11	− 0.4
June	16	F.	+ 0.07	. .
	20	F.	+ 0.04	− 0.1
	28	F.	+ 0.08	+ 1.8
July	7	E.	+ 0.05	+ 0.4
Oct.	17	Sk.	+ 0.07	+ 1.0
	28	P.	− 0.05	+ 0.5
Dec.	19	Sk.	+ 0.04	+ 0.4
	20	P.	+ 0.02	+ 1.6
	22	F.	+ 0.11	+ 2.5
Mean			+ 0.037	+ 1.47
Div., Flex., etc. .			. .	− 0.07

β TAURI.

	h.	m.	s.
Right Ascension. . .	5	18	23.452
	°	′	″
North-Polar Distance .	61	30	1.24

1875.			s.	″
Feb.	28	E.	− 0.06	+ 2.7
Mar.	4	E.	− 0.03	+ 1.9
	8	E.	− 0.03	+ 2.3
	13	F.	− 0.01	+ 1.6
April	30	F.	− 0.01	+ 1.8
May	13	Sk.	+ 0.12	+ 0.4
	17	F.	− 0.11	+ 0.1
June	16	F.	− 0.02	+ 2.9
July	7	E.	0.00	0.0
	25	E.	+ 0.02	− 0.3
Oct.	17	Sk.	− 0.07	+ 1.0
Nov.	14	Sk.	− 0.06	+ 1.4
	29	P.	− 0.09	+ 1.7
Dec.	12	P.	0.00	+ 0.3
	19	Sk.	− 0.13	− 0.6
	20	P.	− 0.07	+ 0.8
	22	F.	− 0.03	+ 1.1
Mean			− 0.034	+ 1.12
Div., Flex., etc. .			. .	− 0.06

δ ORIONIS.

	h.	m.	s.
Right Ascension. . .	5	25	37.294
	°	′	″
North-Polar Distance .	90	23	36.65

1875.			s.	″
Feb.	5	F.	− 0.05	. .
	28	E.	(+ 0.09)	+ 1.8
Mar.	4	E.	− 0.01	+ 2.5
	8	E.	− 0.03	+ 2.5
	13	F.	− 0.03	+ 1.4
	30	F.	0.00	+ 1.8
May	13	Sk.	− 0.05	+ 1.2
	17	F.	− 0.02	− 0.6
	31	E.	− 0.01	. .
June	16	F.	− 0.06	+ 1.2
July	7	E.	0.00	− 0.9
	25	E.	− 0.05	+ 1.0
Oct.	17	Sk.	− 0.09	+ 0.9
Nov.	14	Sk.	− 0.03	+ 0.9
	29	P.	+ 0.03	+ 1.0
Dec.	19	Sk.	− 0.04	. .
	22	F.	+ 0.10	+ 0.4
Mean			− 0.023	+ 1.08
Div., Flex., etc. .			. .	− 0.01

α LEPORIS.

	h.	m.	s.
Right Ascension. . .	5	27	13.114
	°	′	″
North-Polar Distance .	107	54	47.16

1875.			s.	″
Jan.	14	Sk.	− 0.10	+ 1.4
Feb.	5	F.	− 0.13	+ 2.3
	14	S.	+ 0.02	+ 0.3
May	28	F.	+ 0.07	+ 1.4
Nov.	29	P.	+ 0.09	+ 2.3
Dec.	19	Sk.	− 0.07	. .
Mean			− 0.020	+ 1.54
Div., Flex., etc. .			. .	− 0.07

ε ORIONIS.

	h.	m.	s.
Right Ascension. . .	5	29	52.264
	°	′	″
North-Polar Distance .	91	17	0.48

1875.			s.	″
Jan.	14	Sk.	− 0.02	− 0.4
Feb.	14	S.	0.00	+ 0.6
May	28	F.	− 0.05	− 1.2
	31	E.	− 0.01	+ 0.8
June	28	F.	− 0.01	+ 3.7
July	7	E.	+ 0.05	+ 1.5
	25	E.	− 0.01	+ 0.4
Nov.	29	P.	+ 0.06	+ 1.5
Dec.	19	Sk.	+ 0.07	− 0.2
Mean			+ 0.009	+ 0.74
Div., Flex., etc. .			. .	− 0.02

α ORIONIS.

	h.	m.	s.
Right Ascension. . .	5	48	24.303
	°	′	″
North-Polar Distance .	82	37	5.06

1875.			s.	″
Jan.	14	Sk.	− 0.09	+ 1.3
Feb.	9	F.	− 0.03	+ 4.0
	14	S.	− 0.07	+ 1.5
May	7	E.	+ 0.02	+ 1.6
	28	F.	. .	− 0.8
July	7	E.	0.00	+ 1.1
	25	E.	− 0.03	+ 0.7
Dec.	13	E.	− 0.11	+ 2.9
Mean			− 0.044	+ 1.54
Div., Flex., etc. .			. .	− 0.28

22 CAMELOPARDALIS.

	h.	m.	s.
Right Ascension. . .	6	5	3.933
	°	′	″
North-Polar Distance .	20	38	24.42

1875.			s.	″
Feb.	16	E.	+ 0.13	+ 1.6
Mar.	13	F.	+ 0.16	+ 2.5
Mean			+ 0.145	+ 2.05
Div., Flex., etc. .			. .	− 1.25

22 CAMELOPARDALIS, S. P.

	h.	m.	s.
Right Ascension. . .	6	5	3.933
	°	′	″
North-Polar Distance .	339	21	35.58

1875.			s.	″
Aug.	9	P.	+ 0.27	+ 2.0
	20	P.	. .	+ 2.4
Mean			. .	+ 2.20
Div., Flex., etc. .			. .	− 1.19

μ GEMINORUM.

	h.	m.	s.
Right Ascension. . .	6	15	23.926
	°	′	″
North-Polar Distance .	67	25	27.21

1875.			s.	″
Feb.	1	F.	(− 0.24)	. .
	4	E.	− 0.14	+ 3.1
	9	F.	− 0.04	+ 2.6
	12	E.	− 0.08	+ 2.8
	13	F.	− 0.17	+ 2.4
	15	Sk.	− 0.13	. .
May	27	E.	− 0.04	+ 1.4
	28	F.	− 0.13	. .
July	25	E.	− 0.08	+ 1.1
Aug.	4	E.	− 0.12	+ 1.3
	5	Sk.	− 0.09	+ 1.4
	25	P.	+ 0.03	+ 1.5
Oct.	19	F.	− 0.07	+ 2.0
	21	Sk.	− 0.11	. .
Nov.	12	P.	− 0.13	+ 0.8
Dec.	19	Sk.	− 0.08	+ 0.3
Mean			− 0.092	+ 1.72
Div., Flex., etc. .			. .	− 0.21

γ GEMINORUM.

	h.	m.	s.
Right Ascension. . .	6	30	29.460
	°	′	″
North-Polar Distance .	73	29	44.93

1875.			s.	″
Feb.	4	E.	− 0.02	+ 3.2
	12	E.	− 0.09	+ 1.7
	14	S.	− 0.09	+ 2.2
	15	Sk.	− 0.08	+ 2.0
	22	S.	− 0.12	+ 2.1
	26	S.	− 0.10	+ 2.2
	27	Sk.	− 0.12	+ 1.4
May	22	Sk.	+ 0.01	+ 3.4
	27	E.	− 0.05	+ 3.9
	28	F.	− 0.08	. .
June	17	F.	− 0.06	+ 5.1
July	25	E.	− 0.05	+ 3.0
Aug.	4	E.	− 0.02	+ 1.3
	5	Sk.	− 0.04	+ 1.8
	25	P.	+ 0.04	+ 2.1
Oct.	17	Sk.	− 0.04	+ 2.9
	19	F.	− 0.09	. .
Nov.	12	P.	− 0.15	+ 1.9
Dec.	13	E.	− 0.10	+ 2.0
	19	Sk.	− 0.07	+ 1.8
	27	Sk.	. .	− 0.2
Mean			− 0.066	+ 2.31
Div., Flex., etc. .			. .	− 0.38

γ GEMINORUM (Ref.).

1875.			s.	″
Dec.	27	Sk.	. .	+ 3.5
Div., Flex., etc. .			. ..	+ 0.66

α Canis Majoris.

	h.	m.	s.
Right Ascension. . .	6	39	38.354
	°	′	″
North-Polar Distance .	106	32	45.63

1875.			s.	″
Feb.	4	E.	− 0.08	+ 1.0
	12	E.	+ 0.02	+ 1.6
	13	F.	+ 0.02	+ 2.8
	15	Sk.	− 0.02	+ 2.5
	22	S.	+ 0.10	+ 2.0
	26	S.	+ 0.02	+ 2.5
	27	Sk.	− 0.04	+ 1.9
May	27	E.	+ 0.01	− 0.8
	28	F.	0.00	. .
June	4	E.	+ 0.03	+ 1.8
	17	F.	− 0.05	+ 3.5
July	25	E.	+ 0.01	+ 2.9
Aug.	4	E.	+ 0.12	+ 0.8
	5	Sk.	+ 0.03	+ 1.5
	8	P.	+ 0.11	0.0
	25	P.	+ 0.05	+ 1.5
Oct.	19	F.	+ 0.09	+ 2.5
Nov.	12	P.	+ 0.11	− 0.6
Dec.	13	E.	+ 0.08	+ 3.5
Mean			+ 0.032	+ 1.72
Div., Flex., etc. .			. .	− 0.06

51 Cephei.

	h.	m.	s.
Right Ascension. . .	6	41	14.430
	°	′	″
North-Polar Distance .	2	45	55.57

1875.			s.	″
Feb.	4	E.	+ 0.29δ	+ 1.8
	5	F.	+ 0.32δ	+ 0.9
	11	Sk.	− 0.42δ	+ 6.0
	12	E.	+ 0.25δ	. .
	13	F.	− 0.52δ	. .
	14	S.	+ 0.62δ	+ 2.1
	16	E.	+ 0.69δ	− 1.0
	17	F.	− 0.43δ	. .
	22	S.	+ 0.01	− 1.5
	26	S.	+ 0.26a δ	+ 0.9
	27	Sk.	− 0.98	+ 1.2
Mar.	4	E.	− 0.54a δ	+ 2.7
	8	E.	− 0.58a δ	+ 3.4
Aug.	25	P.	+ 0.98	. .
Oct.	19	F.	− 0.16δ	. .
	21	Sk.	− 0.06δ λ	+ 1.4
Nov.	12	P.	− 0.04	+ 1.2
Dec.	13	E.	− 0.32δ	+ 0.2
	19	Sk.	− 0.39a	. .
	20	P.	+ 0.43	+ 0.7
Mean			. .	+ 1.43
Div., Flex., etc. .			. .	− 1.07

51 Cephei, S. P.

	h.	m.	s.
Right Ascension. . .	6	41	14.430
	°	′	″
North-Polar Distance .	357	14	4.43

1875.			s.	″
April	24	Sk.	+ 0.09δ	− 0.8
May	22	Sk.	+ 1.89a δ	. .
July	7	F.	+ 0.08δ	+ 2.9
	30	E.	+ 1.06δ	+ 1.3
Aug.	5	E.	+ 0.45δ	+ 1.2
	5	P.	. .	+ 1.2
	9	P.	+ 0.72a δ	+ 1.2
	20	P.	− 0.52a	+ 2.8
	21	P.	− 0.37a δ λ	+ 2.5
	25	P.	+ 1.29	. .
	26	Sk.	+ 1.60a	+ 1.8
Sept.	4	P.	+ 0.77	+ 2.2
	8	P.	+ 0.28	+ 1.9
Oct.	2	E.	+ 0.38a δ	+ 1.4
	13	Sk.	+ 0.32a δ	. .
Mean			. .	+ 1.63
Div., Flex., etc. . .			. .	− 1.13

ε Canis Majoris.

	h.	m.	s.
Right Ascension. . .	6	53	42.878
	°	′	″
North-Polar Distance .	118	48	11.65

1875.			s.	″
Feb.	12	E.	− 0.01	+ 0.2
	13	F.	+ 0.06	+ 0.9
	16	E.	− 0.16	+ 0.2
	26	S.	− 0.01	+ 1.3
	27	Sk.	− 0.08	+ 0.1
Mar.	16	E.	0.00	. .
June	11	Sk.	− 0.06	+ 0.7
July	25	E.	− 0.11	− 0.6
Aug.	4	E.	− 0.04	− 0.2
	8	P.	− 0.03	− 1.4
	19	E.	− 0.12	− 0.3
Nov.	12	P.	− 0.05	− 1.0
Dec.	13	E.	− 0.05	. .
Mean			− 0.051	+ 0.01
Div., Flex., etc. .			. .	+ 0.23

δ Canis Majoris.

	h.	m.	s.
Right Ascension. . .	7	3	18.593
	°	′	″
North-Polar Distance .	116	11	44.23

1875.			s.	″
Feb.	12	E.	− 0.08	+ 2.3
	16	E.	− 0.08	+ 4.3
	27	Sk.	− 0.12	+ 2.6
Mar.	16	E.	+ 0.01	. .
June	11	Sk.	+ 0.03	+ 2.5
July	25	E.	− 0.04	+ 2.2
Aug.	8	P.	+ 0.06	+ 0.5
	19	E.	− 0.17	+ 3.5
Oct.	17	Sk.	− 0.04	+ 2.4
Nov.	12	P.	− 0.04	− 0.2
Mean			− 0.047	+ 2.23
Div., Flex., etc. .			. .	+ 0.18

δ Geminorum.

	h.	m.	s.
Right Ascension. . .	7	12	39.435
	°	′	″
North-Polar Distance .	67	47	21.44

1875.			s.	″
Feb.	12	E.	− 0.09	+ 2.6
	13	F.	− 0.09	+ 2.7
	16	E.	− 0.14	+ 1.2
	27	Sk.	− 0.22	+ 2.3
Mar.	16	E.	− 0.11	. .
	17	F.	− 0.06	. .
Aug.	4	E.	− 0.10	+ 2.3
	8	P.	− 0.05	− 0.7
	19	E.	− 0.03	+ 1.5
Oct.	17	Sk.	− 0.02	+ 2.0
Nov.	12	P.	− 0.16	+ 0.9
Dec.	20	P.	− 0.12	+ 2.8
Mean			− 0.099	+ 1.76
Div., Flex., etc. .			. .	− 0.23

Piazzi VII, 67, S. P.

	h.	m.	s.
Right Ascension. . .	7	17	51.422
	°	′	″
North-Polar Distance .	338	43	1.72

1875.			s.	″
Aug.	5	E.	− 0.03	+ 1.8
	9	P.	− 0.34	+ 3.4
	31	F.	+ 0.02	+ 3.4
Mean			− 0.117	+ 2.87
Div., Flex., etc. .			. .	− 1.16

α² Geminorum.

	h.	m.	s.
Right Ascension. . .	7	26	37.046
	°	′	″
North-Polar Distance .	57	50	22.13

1875.			s.	″
Feb.	5	F.	. .	+ 0.8
	11	Sk.	+ 0.27	+ 1.9
	17	F.	+ 0.24	. .
Mar.	4	E.	+ 0.21	+ 1.3
	8	E.	+ 0.19	+ 2.4
	12	E.	+ 0.27	+ 1.7
	17	F.	+ 0.24	+ 1.3
June	4	E.	+ 0.29	+ 2.0
	21	F.	+ 0.27	+ 3.1
Aug.	4	E.	+ 0.28	+ 0.3
	8	P.	+ 0.36	+ 0.2
	19	P.	+ 0.38	− 1.4
Oct.	20	P.	+ 0.33	− 0.2
	21	Sk.	+ 0.28	+ 1.7
Nov.	14	Sk.	+ 0.21	+ 0.5
Dec.	22	F.	+ 0.31	+ 1.2
Mean			+ 0.275	+ 1.12
Div., Flex., etc. .			. .	− 0.03

α Canis Minoris.

	h.	m.	s.
Right Ascension. . .	7	32	45.560
	°	′	″
North-Polar Distance .	84	27	23.08

1875.			s.	″
Feb.	5	F.	− 0.20	+ 1.8
	11	Sk.	− 0.17	+ 2.2
	17	F.	− 0.10	. .
Mar.	4	E.	− 0.16	+ 2.6
	8	E.	− 0.15	+ 1.9
	12	E.	− 0.11	− 4.0
	17	F.	− 0.15	− 1.3
June	4	E.	− 0.10	+ 3.7
	19	Sk.	− 0.03	. .
	21	F.	− 0.25	+ 1.6
	23	Sk.	− 0.14	− 0.3
Aug.	4	E.	− 0.14	− 0.3
	8	P.	− 0.11	+ 0.2
	18	E.	− 0.16	+ 0.5
	19	P.	− 0.05	− 0.8
	25	Sk.	− 0.04	− 0.4
Oct.	19	F.	− 0.14	− 0.7
	20	P.	− 0.14	0.0
	21	Sk.	− 0.11	− 0.6
Nov.	14	Sk.	− 0.17	+ 0.8
	17	P.	− 0.20	− 1.6
Dec.	27	Sk.	− 0.15	. .
Mean			− 0.135	+ 0.28
Div., Flex., etc. .			. .	− 0.13

β Geminorum.

	h.	m.	s.
Right Ascension. . .	7	37	39.913
	°	′	″
North-Polar Distance .	61	40	25.00

1875.			s.	″
Feb.	5	F.	− 0.12	+ 1.0
	11	Sk.	− 0.12	+ 2.0
	17	F.	− 0.01	. .
Mar.	4	E.	. .	+ 4.1
	8	E.	− 0.08	+ 3.3
	10	F.	− 0.07	+ 2.7
	12	E.	− 0.08	+ 1.9
	13	F.	− 0.13	+ 0.3
	17	F.	− 0.02	+ 0.8
June	4	E.	− 0.03	+ 3.2
	17	F.	− 0.13	+ 3.0
	19	Sk.	+ 0.08	. .
	21	F.	− 0.12	+ 3.3
	23	Sk.	− 0.12	+ 1.1

β GEMINORUM—Continued.

1875.			s.	″
Aug.	4	E.	− 0.03	+ 1.2
	9	Sk.	+ 0.06	− 0.2
	18	E.	− 0.03	+ 1.1
	19	P.	+ 0.01	− 1.2
	25	Sk.	+ 0.03	+ 0.5
Oct.	19	F.	− 0.09	− 0.3
	20	P.	− 0.06	+ 0.6
	21	Sk.	− 0.15	+ 1.3
Nov.	14	Sk.	− 0.09	+ 1.1
	17	P.	− 0.14	0.0
Dec.	27	Sk.	− 0.11	+ 0.3
Mean			− 0.065	+ 1.35
Div., Flex., etc. .			. .	− 0.06

φ GEMINORUM.

	h.	m.	s.
Right Ascension . . .	7	45	50.776
North-Polar Distance .	62°	54′	44″.93

1875.			s.	″
Feb.	5	F.	− 0.08	+ 0.9
Oct.	19	F.	− 0.16	0.0
Dec.	22	F.	− 0.18	+ 0.9
Mean			− 0.140	+ 0.60
Div., Flex., etc. .			. .	− 0.09

15 ARGÛS.

	h.	m.	s.
Right Ascension . . .	8	2	13.325
North-Polar Distance .	113°	56′	41″.82

1875.			s.	″
Mar.	10	F.	− 0.03	+ 3.5
	12	E.	− 0.02	+ 1.5
Mean			− 0.025	+ 2.50
Div., Flex., etc. .			. .	+ 0.14

ε HYDRÆ.

	h.	m.	s.
Right Ascension . . .	8	40	9.283
North-Polar Distance .	83°	7′	25″.24

1875.			s.	″
Feb.	15	Sk.	− 0.06	+ 2.1
Mar.	10	F.	− 0.07	+ 2.5
	12	E.	− 0.11	+ 2.3
	17	F.	. .	+ 0.9
April	5	E.	− 0.06	+ 3.5
May	10	Sk.	− 0.02	+ 4.0
June	29	F.	− 0.12	+ 2.9
Sept.	7	P.	− 0.01	+ 1.2
Oct.	21	Sk.	− 0.04	+ 2.2
Nov.	14	Sk.	+ 0.05	+ 1.6
Mean			− 0.049	+ 2.32
Div., Flex., etc. .			. .	− 0.24

ι URSÆ MAJORIS.

	h.	m.	s.
Right Ascension . . .	8	50	38.428
North-Polar Distance .	41°	28′	9″.67

1875.			s.	″
May	10	Sk.	+ 0.11	− 0.8
Aug.	24	P.	+ 0.28	− 1.2
	25	Sk.	+ 0.20	− 1.3
	29	P.	+ 0.23	+ 1.7
Sept.	7	P.	+ 0.22	+ 0.5
Mean			+ 0.208	− 0.22
Div., Flex., etc. .			. .	− 0.92

ι URSÆ MAJORIS (Ref.).

1875.			s.	″
Mar.	12	E.	+ 0.05	− 0.2
Div., Flex., etc. .			. .	+ 1.34

σ² URSÆ MAJORIS.

	h.	m.	s.
Right Ascension . . .	8	59	22.051
North-Polar Distance .	22°	21′	38″.62

1875.			s.	″
Mar.	12	E.	− 0.31	− 1.4
Dec.	22	F.	− 0.05	− 0.2
Mean			− 0.180	− 0.80
Div., Flex., etc. .			. .	− 1.16

σ² URSÆ MAJORIS, S. P.

	h.	m.	s.
Right Ascension . . .	8	59	22.051
North-Polar Distance .	337°	38′	21″.38

1875.			s.	″
July	29	Sk.	+ 0.07	+ 3.9
Aug.	30	P.	+ 0.33	+ 2.1
Sept.	20	P.	+ 0.03	+ 1.0
	24	P.	+ 0.08	+ 3.6
Oct.	12	F.	+ 0.18	+ 4.5
	20	P.	− 0.07	+ 3.2
Nov.	5	P.	+ 0.09	+ 2.8
	12	P.	− 0.17	+ 5.9
Mean			+ 0.068	+ 3.38
Div., Flex., etc. .			. .	− 1.10

1 DRACONIS.

	h.	m.	s.
Right Ascension . . .	9	19	5.961
North-Polar Distance .	8°	7′	26″.11

1875.			s.	″
Mar.	12	E.	− 0.60	+ 2.2
Div., Flex., etc. .			. .	− 1.21

1 DRACONIS, S. P.

	h.	m.	s.
Right Ascension . . .	9	19	5.961
North-Polar Distance .	351°	52′	33″.89

1875.			s.	″
Aug.	9	P.	− 0.68	+ 0.5
	25	P.	− 0.30	+ 0.5
Sept.	3	F.	− 0.85	+ 1.8
	8	P.	+ 0.43	+ 0.4
	20	P.	− 0.31	+ 0.2
Nov.	2	P.	− 0.08	+ 0.8
Mean			− 0.298	+ 0.70
Div., Flex., etc. .			. .	− 1.35

α HYDRÆ.

	h.	m.	s.
Right Ascension . . .	9	21	26.703
North-Polar Distance .	98°	7′	3″.48

1875.			s.	″
Feb.	15	Sk.	− 0.02	+ 1.1
Mar.	10	F.	− 0.01	+ 3.6
	12	E.	(+ 0.24)	+ 2.1
	13	F.	+ 0.05	+ 0.8
April	5	E.	− 0.03	+ 3.9
	14	F.	− 0.04	+ 3.1
May	10	Sk.	+ 0.06	+ 2.7
June	29	F.	− 0.03	+ 2.0
July	8	E.	− 0.04	+ 2.0

α HYDRÆ—Continued.

1875.			s.	″
Sept.	3	P.	+ 0.03	+ 1.7
	7	P.	− 0.02	+ 2.3
	24	F.	− 0.11	+ 2.1
Nov.	14	Sk.	+ 0.03	+ 0.7
Dec.	12	P.	+ 0.04	+ 1.0
Mean			− 0.007	+ 2.08
Div., Flex., etc. .			. .	− 0.06

d URSÆ MAJORIS, S. P.

	h.	m.	s.
Right Ascension . . .	9	23	23.535
North-Polar Distance .	340°	22′	39″.56

1875.			s.	″
Sept.	14	P.	+ 0.29	+ 0.5
	25	F.	− 0.16	+ 1.6
Oct.	13	Sk.	+ 0.30	+ 1.2
Nov.	2	P.	. .	+ 2.4
Mean			+ 0.143	+ 1.42
Div., Flex., etc. .			. .	+ 1.23

θ URSÆ MAJORIS.

	h.	m.	s.
Right Ascension . . .	9	24	29.091
North-Polar Distance .	47°	45′	15″.71

1875.			s.	″
Aug.	25	Sk.	+ 0.13	+ 0.2
Sept.	24	F.	. .	+ 1.7
Mean			+ 0.130	+ 0.95
Div., Flex., etc. .			. .	− 0.69

ε LEONIS.

	h.	m.	s.
Right Ascension . . .	9	38	45.220
North-Polar Distance .	65°	39′	3″.84

1875.			s.	″
April	5	E.	− 0.22	+ 2.2
	8	Sk.	− 0.11	+ 3.4
	20	Sk.	− 0.14	. .
	21	E.	− 0.07	+ 1.9
May	11	E.	− 0.08	+ 2.1
Aug.	29	P.	(+ 0.15)	. .
Sept.	3	P.	− 0.08	+ 1.6
	19	P.	− 0.01	. .
	24	F.	− 0.13	+ 1.5
Dec.	20	P.	− 0.10	+ 0.7
Mean			− 0.104	+ 1.91
Div., Flex., etc. .			. .	− 0.16

ε LEONIS (Ref.).

1875.			s.	″
May	10	Sk.	. .	+ 0.2
Div., Flex., etc. .				+ 0.70

μ LEONIS.

	h.	m.	s.
Right Ascension . . .	9	45	39.048
North-Polar Distance .	63°	24′	18″.85

1875.			s.	″
April	5	E.	− 0.12	+ 2.1
	7	F.	+ 0.01	+ 2.1
	21	E.	+ 0.03	+ 2.1
Sept.	24	F.	. .	+ 0.9
Dec.	22	F.	+ 0.05	+ 0.7
Mean			− 0.008	+ 1.58
Div., Flex., etc. .			. .	− 0.10

α Leonis.

	h.	m.	s.
Right Ascension . . .	10	1	42.850
	°	′	″
North-Polar Distance .	77	25	20.60

1875.			s.	″
Mar.	10	F.	− 0.04	+ 3.9
	13	F.	− 0.06	+ 2.6
April	8	Sk.	+ 0.02	+ 3.7
	14	F.	− 0.15	+ 3.3
	20	Sk.	− 0.02	. .
	21	E.	− 0.06	+ 3.4
May	11	E.	− 0.02	+ 3.8
July	19	F.	− 0.05	+ 3.4
Aug.	10	Sk.	+ 0.04	+ 2.5
Sept.	2	F.	+ 0.07	+ 3.1
	19	P.	− 0.01	. .
	20	F.	− 0.08	+ 1.0
	24	F.	− 0.03	+ 3.0
Oct.	1	E.	− 0.01	− 0.1
Dec.	12	P.	0.00	+ 0.9
	22	F.	− 0.07	+ 2.1
Mean			− 0.029	+ 2.61
Div., Flex., etc. .			. .	− 0.34

α Leonis (Ref.).

1875.			s.	″
May	10	Sk.	. .	+ 2.2
Div., Flex., etc.				+ 0.71

32 Ursæ Majoris.

	h.	m.	s.
Right Ascension . . .	10	8	56.016
	°	′	″
North-Polar Distance .	24	16	10.01

1875.			s.	″
April	14	F.	+ 0.10	− 1.2
Dec.	22	F.	+ 0.02	− 2.9
Mean			+ 0.060	− 2.05
Div., Flex., etc. .			. .	− 1.10

32 Ursæ Majoris, S.P.

	h.	m.	s.
Right Ascension . . .	10	8	56.016
	°	′	″
North-Polar Distance .	335	43	49.99

1875.			s.	″
Aug.	9	P.	− 0.04	+ 3.7
Sept.	7	F.	− 0.13	+ 3.1
Nov.	2	P.	+ 0.14	+ 1.5
Mean			− 0.010	+ 2.77
Div., Flex., etc. .			. .	− 1.01

γ^1 Leonis.

	h.	m.	s.
Right Ascension . . .	10	13	4.711
	°	′	″
North-Polar Distance .	69	31	35.91

1875.			s.	″
Mar.	10	F.	− 0.07	+ 0.1
	13	F.	− 0.01	+ 0.8
April	7	F.	+ 0.03	+ 2.1
	8	Sk.	0.00	+ 4.1
	14	F.	− 0.04	+ 1.7
	20	Sk.	0.00	+ 3.3
	21	E.	− 0.03	+ 2.0
May	11	E.	0.00	+ 2.7
July	19	F.	− 0.01	+ 3.6
Aug.	10	Sk.	+ 0.04	+ 2.7
Sept.	2	F.	+ 0.08	+ 5.1
	3	P.	+ 0.04	+ 3.7
	10	F.	+ 0.02	+ 0.9
	19	P.	+ 0.08	. .
	20	F.	+ 0.01	+ 2.4
	24	F.	− 0.07	+ 3.1

γ^1 Leonis—Continued.

1875.			s.	″
Oct.	1	E.	+ 0.02	+ 0.1
	7	Sk.	− 0.02	− 0.3
Dec.	12	P.	− 0.08	. .
	22	F.	− 0.03	+ 1.0
Mean			− 0.002	+ 2.17
Div., Flex., etc. .			. .	− 0.30

9 Draconis.

	h.	m.	s.
Right Ascension . . .	10	24	25.033
	°	′	″
North-Polar Distance .	13	38	39.99

1875.			s.	″
April	20	Sk.	− 0.23	+ 2.2
May	10	Sk.	− 0.10	+ 2.1
Mean			− 0.165	+ 2.15
Div., Flex., etc. .			. .	− 1.20

9 Draconis, S. P.

	h.	m.	s.
Right Ascension . . .	10	24	25.033
	°	′	″
North-Polar Distance .	346	21	20.01

1875.			s.	″
Aug.	9	P.	− 0.36	+ 1.6
	26	Sk.	+ 0.15	+ 1.0
Nov.	2	P.	− 0.23	+ 0.7
Mean			− 0.147	+ 1.10
Div., Flex., etc. .			. .	− 1.31

ρ Leonis.

	h.	m.	s.
Right Ascension . . .	10	26	13.756
	°	′	″
North-Polar Distance .	80	3	2.59

1875.			s.	″
Mar.	13	F.	− 0.04	+ 4.4
April	7	F.	− 0.14	+ 2.0
May	11	E.	− 0.06	+ 2.9
Sept.	6	F.	− 0.10	. .
	20	F.	− 0.07	+ 0.5
	24	F.	− 0.13	+ 1.4
Mean			− 0.090	+ 2.24
Div., Flex., etc. .			. .	− 0.40

l Leonis.

	h.	m.	s.
Right Ascension . . .	10	42	41.132
	°	′	″
North-Polar Distance .	78	47	37.02

1875.			s.	″
May	11	E.	− 0.06	+ 2.8
	12	F.	− 0.04	+ 3.4
Mean			− 0.050	+ 3.10
Div., Flex., etc. .			. .	− 0.38

α Ursæ Majoris.

	h.	m.	s.
Right Ascension . . .	10	55	59.832
	°	′	″
North-Polar Distance .	27	34	29.37

1875.			s.	″
May	6	Sk.	− 0.29	. .
	11	E.	− 0.25	+ 2.0
	27	E.	. .	+ 1.3

α Ursæ Majoris—Continued.

1875.			s.	″
Aug.	5	E.	+ 0.17	− 0.6
	10	Sk.	+ 0.28	+ 0.6
Sept.	10	F.	− 0.02	+ 1.6
	19	P.	+ 0.21	. .
	20	F.	+ 0.30	+ 1.6
	24	F.	+ 0.21	+ 0.9
Oct.	8	P.	− 0.06	− 0.8
Mean			+ 0.061	+ 0.82
Div., Flex., etc. .			. .	− 1.04

α Ursæ Majoris (Ref.).

1875.			s.	″
May	10	Sk.	. .	− 2.4
	11	E.	. .	− 3.1
	27	E.	. .	− 1.3
Mean			. .	− 2.27
Div., Flex., etc. .			. .	+ 1.79

δ Leonis.

	h.	m.	s.
Right Ascension . . .	11	7	27.563
	°	′	″
North-Polar Distance .	68	47	29.51

1875.			s.	″
April	7	F.	− 0.09	+ 2.7
	29	E.	− 0.17	+ 4.5
May	4	F.	− 0.05	+ 3.6
	10	Sk.	− 0.14	+ 3.1
	11	E.	− 0.16	+ 3.7
	12	F.	− 0.10	+ 1.2
	27	E.	− 0.13	+ 1.5
Aug.	5	E.	− 0.05	+ 1.6
	6	Sk.	− 0.09	+ 1.9
	26	Sk.	− 0.02	+ 0.5
Sept.	20	F.	+ 0.04	+ 2.7
	24	F.	− 0.14	+ 0.3
Oct.	1	E.	− 0.04	+ 0.2
	4	Sk.	− 0.02	+ 1.8
	7	Sk.	− 0.08	0.0
Dec.	18	F.	− 0.15	+ 1.2
	20	P.	− 0.04	+ 1.7
	22	F.	− 0.07	+ 1.4
Mean			− 0.083	+ 1.87
Div., Flex., etc. .			. .	− 0.28

δ Leonis (Ref.).

1875.			s.	″
April	20	Sk.	. .	+ 1.3
	21	E.	. .	+ 0.8
Mean			. .	+ 1.05
Div., Flex., etc. .			. .	+ 0.69

δ Crateris.

	h.	m.	s.
Right Ascension . . .	11	13	5.561
	°	′	″
North-Polar Distance .	104	6	7.72

1875.			s.	″
April	7	F.	+ 0.02	+ 2.3
	29	E.	0.00	+ 0.8
May	4	F.	+ 0.06	+ 0.8
	12	F.	+ 0.04	+ 2.2
	13	Sk.	0.00	+ 0.1
Nov.	21	P.	+ 0.03	− 0.8
Dec.	20	P.	− 0.07	+ 1.8
	22	F.	− 0.07	− 0.4
Mean			+ 0.001	+ 0.85
Div., Flex., etc. .			. .	− 0.01

τ Leonis.

	h.	m.	s.
Right Ascension . . .	11	21	30.554
North-Polar Distance .	86°	27′	19″.48

1875.				s.		″
April	7	F.	−	0.03	+	1.4
May	12	F.	−	0.04	+	0.8
	27	E.	−	0.04	+	0.5
Nov.	21	P.	−	0.04	−	0.3
Mean			−	0.038	+	0.60
Div., Flex., etc. .				. .	−	0.07

λ Draconis.

	h.	m.	s.
Right Ascension . . .	11	23	57.561
North-Polar Distance .	19°	58′	46″.96

1875.				s.		″
April	20	Sk.	+	0.12	+	2.0
May	11	E.		. .	+	0.5
	27	E.	+	0.07	−	0.5
Aug.	26	Sk.	+	0.37	−	2.2
Sept.	24	F.	+	0.49	−	2.0
Nov.	21	P.	+	0.09	−	1.2
Mean			+	0.228	−	0.57
Div., Flex., etc. .				. .	−	1.28

λ Draconis (Ref.).

1875.				s.		″
May	10	Sk.		. .	−	4.4
	11	E.		. .	−	4.2
Mean				. .	−	4.30
Div., Flex., etc. .				. .	+	1.81

λ Draconis, S. P.

	h.	m.	s.
Right Ascension . . .	11	23	57.561
North-Polar Distance .	340°	1′	13″.04

1875.				s.		″
June	23	Sk.	+	0.16	+	0.9
Aug	13	P.		. .	+	3.2
Sept.	24	P.	+	0.16	+	1.5
Oct.	2	E.	+	0.28	+	3.6
	29	Sk.	+	0.28	+	1.4
Nov.	5	P.	−	0.18	+	2.6
	8	F.		. .	+	2.1
	11	E.	+	0.24	+	4.8
Mean			+	0.157	+	2.51
Div., Flex., etc. .				. .	−	1.22

υ Leonis.

	h.	m.	s.
Right Ascension . . .	11	30	32.966
North-Polar Distance .	90°	8′	0″.87

1875.				s.		″
Nov.	21	P.	−	0.04	+	0.2
Div., Flex., etc. .				. .	−	0.01

β Leonis.

	h.	m.	s.
Right Ascension . . .	11	42	40.973
North-Polar Distance .	74°	43′	44″.14

1875.				s.		″
April	29	E.	−	0.05	+	3.6
May	4	F.	−	0.02	+	2.8
	10	Sk.	−	0.03	+	2.8
	12	F.	+	0.05	+	3.6

β Leonis—Continued.

1875.				s.		′
May	13	Sk.	−	0.08	+	3.1
	27	E.	−	0.06	+	1.5
Aug.	5	E.	+	0.06	−	1.5
	6	Sk.	−	0.04	+	2.6
	9	P.	−	0.01	+	4.0
Sept.	3	F.	+	0.10	+	0.9
	24	F.	+	0.09	+	1.9
Oct.	1	E.	+	0.03	+	1.9
	4	Sk.	+	0.06	+	3.2
	7	Sk.	−	0.02	+	0.6
	8	P.	−	0.09	+	1.9
	20	Sk.	+	0.11	+	0.5
	24	Sk.	+	0.16	+	1.8
	28	Sk.	−	0.03	+	1.5
Nov.	21	P	−	0.03	+	0.1
Dec.	18	F.	−	0.07	+	1.1
	20	P.	+	0.07	+	1.6
	22	F.		0.00	−	1.0
Mean			+	0.009	+	1.75
Div., Flex., etc. .				. .	−	0.39

γ Ursæ Majoris.

	h.	m.	s.
Right Ascension . . .	11	47	14.850
North-Polar Distance .	35°	36′	37″.01

1875.				s.		″
May	27	E.	−	0.04	+	0.8
Aug.	5	E.	+	0.08	+	2.2
Sept.	3	F.	+	0.13	+	1.7
Oct.	4	Sk.	+	0.15	+	1.8
	8	P.	+	0.05	+	0.4
	24	Sk.	+	0.12	+	1.0
	28	Sk.		0.00	+	0.5
	31	P.	+	0.06	+	0.2
Nov.	1	P.	+	0.07	+	1.3
	21	P.	−	0.07	+	2.0
Mean . . .			+	0.055	+	1.19
Div., Flex., etc. .				. .	−	1.05

ο Virginis.

	h.	m.	s.
Right Ascension . . .	11	58	50.516
North-Polar Distance .	80°	34′	20″.87

1875.				s.		″
April	29	E.	−	0.03	+	2.5
May	13	Sk.		. .	+	2.4
Oct.	31	P.	−	0.02	+	1.2
Nov.	1	P.	−	0.03	+	1.2
Mean			−	0.027	+	1.82
Div., Flex., etc. .				. .	−	0.39

4 Draconis.

	h.	m.	s.
Right Ascension . . .	12	6	19.373
North-Polar Distance .	11°	41′	22″.33

1875.				s.		″
May	11	E.		. .	+	0 9
Nov.	21	P	−	0.89	−	1.8
Mean				. .	−	0.45
Div., Flex., etc. .				. .	−	1.21

4 Draconis (Ref.).

1875.				s.		″
May	11	E.		. .	−	2.6
	12	F.		. .	−	3.3
Mean				. .	−	2.95
Div., Flex., etc. .				. .	+	1.60

4 Draconis, S. P.

	h.	m.	s.
Right Ascension . . .	12	6	19.373
North-Polar Distance .	348°	18′	37″.67

1875.				s.		″
July	21	Sk.	+	0.46	+	2.7
Div., Flex., etc. .				. .	−	1.35

η Virginis.

	h.	m.	s.
Right Ascension . . .	12	13	30.685
North-Polar Distance .	89°	58′	18″.38

1875.				s.		″
April	5	E.	+	0.02	+	2.7
	7	F.	−	0.05	+	1.8
May	27	E.	−	0.04	+	0.1
July	8	E.	−	0.01	+	3.6
Nov.	1	P.	+	0.05	+	1.3
	5	Sk.	−	0.02	−	0.5
	21	P.	−	0.02	−	0.1
Dec.	19	Sk.	−	0.05	+	0.9
	20	P.	−	0.08	+	2.3
	22	F.	−	0.05	+	0.8
Mean			−	0.025	+	1.29
Div., Flex., etc. .				. .	−	0.01

η Virginis (Ref.).

1875.				s.		″
April	20	Sk.		. .	+	1.2
Div., Flex., etc. .				. .	+	0.81

β Corvi.

	h.	m.	s.
Right Ascension . . .	12	27	49.433
North-Polar Distance .	112°	42′	17″.08

1875.				s.		″
Feb.	22	S.	+	0.05	+	4.3
April	5	E.	+	0.00	+	3.5
	7	F.	+	0.05	+	1.5
	8	Sk.	(+	0.27)	+	3.4
	22	F.	+	0.01	+	1.1
May	27	E.	+	0.07	+	0.6
July	8	E.	+	0.01	+	2.4
Aug.	6	Sk.	+	0.01	+	2.7
Oct.	26	F.	+	0.15	−	0.4
Nov.	1	P.	+	0.13	+	1.4
	21	P.	+	0.02	+	1.4
Dec.	20	P.	−	0.04	+	1.0
	22	F.	−	0.04	+	0.8
Mean			+	0.035	+	1.82
Div., Flex., etc. .				. .	+	0.09

κ Draconis.

	h.	m.	s.
Right Ascension . . .	12	28	8.291
North-Polar Distance .	19°	31′	22″.56

1875.				s.		″
May	11	E.	+	0.59	+	1.4
	27	E.	−	0.18	+	0.3
	28	F.		. .		0.0
	31	E.		. .	+	1.3
Nov.	8	P.	−	0.03	−	0.7
Mean			+	0.127	+	0.46
Div., Flex., etc. .				. .	−	1.28

κ DRACONIS (Ref.).

1875.				s.		″
May	11	E.		. .	−	3.2
	31	E.		. .	−	3.0
Mean . . .				. .	−	3.10
Div., Flex., etc. .					+	1.77

κ DRACONIS, S. P.

	h.	m.	s.
Right Ascension . . .	12	28	8.291
North-Polar Distance .	340°	28′	37″.44

1875.				s.		″
Sept.	27	F.	−	0.10	+	1.2
Oct.	29	Sk.	−	0.16	+	1.5
Nov.	2	P.	+	0.03	+	2.3
	17	P.	+	0.07	+	3.1
	27	F.	−	0.30	+	0.1
Mean			−	0.092	+	1.64
Div., Flex, etc. .				. .	−	1.23

32² CAMELOPARDALIS.

	h.	m.	s.
Right Ascension . . .	12	48	13.792
North-Polar Distance .	5°	54′	28″.99

1875.				s.		″
May	7	E.	−	0.69	+	1.1
	11	E.		. .	+	3.8
	27	E.	−	0.55	−	2.1
	31	E.	+	0.25	+	1.2
June	4	E.	−	0.71	+	0.6
Mean			−	0.425	+	0.92
Div., Flex., etc. .				. .	−	1.06

32² CAMELOPARDALIS (Ref.).

1875.				s.		″
May	11	E.		. .	−	2.8
	28	F.		. .	−	0.7
Mean . . .				. .	−	1.75
Div., Flex., etc. .					+	1.62

32² CAMELOPARDALIS, S. P.

	h.	m.	s.
Right Ascension . . .	12	48	13.792
North-Polar Distance .	354°	5′	31″.01

1875.				s.		″
Aug.	13	P.	+	0.27	+	4 9
	20	P.	−	1.14	+	6.2
Sept.	14	P.	−	0.27	+	2.0
	24	P.	−	0.75	+	3.3
Nov.	2	P.	−	0.47	+	3.6
	10	Sk.	−	1.03	+	3.4
	17	P.	−	0.30	+	2.7
Mean			−	0.527	+	3.73
Div., Flex., etc. .				. .	−	1.19

12 CANUM VENATICORUM.

	h.	m.	s.
Right Ascension . . .	12	50	10.685
North-Polar Distance .	51°	0′	21″.64

1875.				s.		″
Feb.	22	S.	−	0.17	+	2.0
April	5	E.	−	0.02	+	1.4
	7	F.	−	0.09	+	2.0
	21	E.	+	0.05	+	2.0
	22	F.	−	0.03	+	2.5
May	4	F.		0.00	+	1.9
	7	E.	−	0.04	+	3.4
	10	Sk.	−	0.10	+	2.1
May	12	F.		0.00	+	3.1
	27	E.	−	0.03	+	2.0
	31	E.	−	0.01	+	1.5
June	4	E.	+	0.01	+	2.7
	11	Sk.	−	0.04	+	2.3
July	8	E.	−	0.03	+	2.7
Aug.	6	Sk.	−	0.06	+	3.0
	26	Sk.	+	0.15	+	1.5
	30	P.	+	0.05	+	3.5
Sept.	1	P.	+	0.09		. .
	4	P.		0.00	+	1.5
	8	P.	+	0.05	+	1.4
	11	F.	−	0.02	+	2.3
	24	P.	+	0.08	+	1.2
Oct.	2	E.	+	0.01	+	1.0
	19	Sk.	+	0.03		. .
	20	Sk.	−	0.07		. .
	25	E.		. .	−	0.5
	26	F.	+	0.08	+	2.7
	27	P.	+	0.08	+	1.0
	28	Sk.	+	0.02	+	1.0
	31	P.		0.00	+	0.9
Nov.	1	P.	+	0.08	+	1.4
	5	Sk.	−	0.08	−	1.6
	8	P.	+	0.05	+	1.3
	10	E.	+	0.02	+	1.2
	11	P.	−	0.02	+	1.6
	16	P.	+	0.16	+	0.6
	21	P.	−	0.08	−	0.3
Dec.	19	Sk.	+	0.13	+	0.8
	20	P.	−	0.11	+	0.8
	22	F.	−	0.04	−	0.5
Mean			+	0.003	+	1.55
Div., Flex., etc. .				. .	−	0.36

θ VIRGINIS.

	h.	m.	s.
Right Ascension . . .	13	3	28.784
North-Polar Distance .	94°	52′	15″.24

1875.				s.		″
May	28	F.		. .		0.0
	31	E.	−	0.01	+	2.8
June	4	E.	−	0.12	+	2.5
	16	E.	+	0.08	+	2.5
	23	F.	−	0.07	+	4.0
July	8	E.	−	0.03	+	3.8
Mean			−	0.030	+	2.60
Div., Flex., etc. .				. .	+	0.10

α VIRGINIS.

	h.	m.	s.
Right Ascension . . .	13	18	36.602
North-Polar Distance .	100°	30′	28″.60

1875.				s.		″
April	7	F.	+	0.04	+	3.5
	21	E.	−	0.04	+	1.8
	22	F.		0.00	+	1.7
May	7	E.	−	0.03	+	4.2
	10	Sk.	+	0.07	+	3.0
	13	Sk.	−	0.06	+	2.4
	17	F.		0.00	+	1.7
	19	E.	−	0.01	+	2.7
	27	E.	−	0.04	+	2.4
	28	F.	−	0.01	+	1.8
	31	E.	+	0.01	+	3.7
June	4	E.	−	0.09	+	2.5
	9	F.	+	0.03	+	3.8
	11	Sk.	+	0.01		. .
	13	F.		0.00	+	2.5
	16	E.	+	0.03	+	3.4
	23	F.	−	0.14	+	3.1
July	8	E.	−	0.06	+	2.5
Aug.	26	Sk.		0.00	+	0.2
	30	P.	+	0.04	+	3.0
Sept.	3	F.	+	0.08	−	1.4
	4	P.	+	0.01	+	1.3
Sept.	8	P.	+	0.09	+	0.7
	11	F.	+	0.09	+	1.3
	25	F.		0.00		. .
	27	P.	+	0.11	+	0.4
Nov.	1	P.	+	0.09	+	1.1
	5	Sk.	−	0.03	−	0.6
	8	P.	−	0.06	+	0.4
	10	E.	−	0.02	−	0.1
	11	P.		. .	−	2.9
	16	P.	+	0.02	+	1.5
	21	Sk.	+	0.09	−	0.6
Dec.	19	Sk.	+	0.09		. .
Mean			+	0.009	+	1.65
Div., Flex., etc. .				. .	−	0.09

ζ VIRGINIS.

	h.	m.	s.
Right Ascension . . .	13	28	19.496
North-Polar Distance .	89°	57′	20″.75

1875.				s.		″
Feb.	22	S.	−	0.02	+	3.3
April	22	F.		0.00	+	1.8
	30	F.	−	0.05		. .
May	4	F.	−	0.01	+	2.2
	7	E.	+	0.01	+	3.1
	27	E.	−	0.08	+	1.9
	28	F.	+	0.02	+	2.3
	31	E.	+	0.01	+	2.7
June	4	E.	−	0.12	+	3.4
	13	F.	+	0.06	+	2.5
	16	E.	−	0.06	+	2.9
	23	F.	−	0.08	+	3.6
	29	F.	−	0.02		. .
Aug.	30	P.	+	0.06	+	4.0
Sept.	4	P.	−	0.02	+	3.0
	8	P.	+	0.09	+	3.1
	27	P.	+	0.10	+	3.9
Nov.	1	P	+	0.03	+	2.2
	10	E.	+	0.15	+	1.0
	11	P.	+	0.10	+	0.9
	16	P.	+	0.11	+	1.4
	21	Sk.	+	0.06	−	0.4
Dec.	19	Sk.	+	0.14	+	1.9
Mean			+	0.021	+	2.41
Div., Flex., etc. .				. .	−	0.01

η URSÆ MAJORIS.

	h.	m.	s.
Right Ascension . . .	13	42	36.856
North-Polar Distance .	40°	3′	44″.05

1875.				s.		″
May	7	E.	−	0.15	+	2.6
	19	E.	−	0.12	+	3.2
	27	E.	−	0.24	+	1.5
	31	E.		. .	+	1.9
June	16	E.		. .	+	2.0
	26	F.	−	0.04	+	1.7
Aug.	25	P.	−	0.03	+	0.5
Sept.	4	P.	+	0.06	+	0.9
	8	P.	+	0.05	+	1.6
	11	F.	−	0.07	+	3.2
	21	F.	−	0.03	+	3.1
	25	F.	−	0.05	+	0.8
Oct.	27	P.		0.00	+	2.0
	31	P.	+	0.04	+	0.5
Nov.	1	P.	−	0.11	+	1.7
	8	P.	−	0.02	+	0.8
	10	E.	+	0.12	+	0.6
	11	P.	+	0.03	+	1.5
	12	F.	−	0.07	+	0.7
Mean			−	0.037	+	1.62
Div., Flex., etc. .				. .	−	0.94

η URSÆ MAJORIS (Ref.).

1875.			s.	″
May	28	F.	. .	− 3.0
	31	E.	. .	− 2.5
June	16	E.	. .	− 0.5
Mean			. .	− 2.00
Div., Flex., etc. .			. .	+ 1.32

η BOOTIS.

	h.	m.	s.
Right Ascension . . .	13	48	44.022
North-Polar Distance .	70°	58′	28″.43

1875.			s.	″
April	30	F.	− 0.17	. .
May	4	F.	− 0.11	+ 1.7
	7	E.	− 0.19	+ 3.3
	13	Sk.	− 0.18	+ 2.3
	17	F.	− 0.08	+ 3.0
	27	E.	− 0.12	+ 3.0
	28	F.	− 0.12	+ 2.7
	31	E.	− 0.13	+ 3.1
June	4	E.	− 0.15	+ 2.7
	11	Sk.	− 0.13	+ 3.3
	13	F.	+ 0.01	+ 2.4
	16	E.	− 0.12	+ 3.3
	23	F.	− 0.19	+ 4.5
	26	F.	− 0.09	+ 2.4
Aug.	25	P.	+ 0.03	+ 0.9
	30	P.	− 0.05	+ 4.7
Sept.	1	P.	+ 0.05	+ 3.4
	4	P.	− 0.11	+ 3.1
	7	F.	+ 0.05	. .
	8	P.	− 0.13	+ 3.5
	11	F.	− 0.13	+ 2.7
	21	F.	− 0.01	+ 3.8
	24	P.	+ 0.04	+ 2.2
	27	P.	. .	+ 4.3
Nov.	1	P.	0.00	+ 3.7
	5	Sk.	− 0.05	+ 3.6
	8	P.	− 0.08	+ 1.5
	10	E.	− 0.04	+ 1.9
	11	P.	+ 0.02	+ 2.8
	12	F.	− 0.09	+ 1.0
	30	E.	− 0.06	+ 1.7
Mean			− 0.078	+ 2.84
Div., Flex., etc. .			. .	− 0.33

η BOOTIS (Ref.).

1875.			s.	″
June	9	F.	. .	− 0.5
Div., Flex., etc. .			. .	+ 0.66

α DRACONIS.

	h.	m.	s.
Right Ascension . . .	14	1	0.380
North-Polar Distance .	25°	1′	36″.40

1875.			s.	″
May	31	E.	. .	− 0.8
June	16	E.	. .	− 3.2
Nov.	8	P.	− 0.16	− 2.1
	10	E.	+ 0.26	− 2.3
	11	P.	+ 0.14	+ 0.8
	16	P.	+ 0.04	+ 1.2
Mean			+ 0.070	− 1.07
Div., Flex., etc. .			. .	− 1.09

α DRACONIS (Ref.).

1875.			s.	″
May	31	E.	. .	− 2.1
June	9	E.	. .	− 2.5
	16	E.	. .	− 3.3
Mean			. .	− 2.63
Div., Flex., etc. .			. .	+ 1.75

α DRACONIS, S. P.

	h.	m.	s.
Right Ascension . . .	14	1	0.380
North-Polar Distance .	334°	58′	23″.60

1875.			s.	″
Aug.	13	P.	− 0.04	+ 4.1
Nov.	12	P.	− 0.18	+ 2.8
	17	P.	. .	+ 3.2
Mean			− 0.110	+ 3.37
Div., Flex., etc. .			. .	− 1.00

α BOOTIS.

	h.	m.	s.
Right Ascension . . .	14	9	57.614
North-Polar Distance .	70°	9′	55″.90

1875.			s.	″
April	21	E.	+ 0.01	+ 1.8
May	4	F.	− 0.07	+ 3.3
	11	E.	. .	+ 2.5
	12	F.	− 0.01	+ 3.2
	17	F.	− 0.01	+ 4.4
	18	Sk.	− 0.13	. .
	31	E.	. .	+ 2.1
June	4	E.	. .	+ 1.0
	26	F.	− 0.06	+ 3.5
Aug.	25	P.	+ 0.04	+ 1.3
Sept.	7	F.	− 0.02	+ 2.9
	11	F.	− 0.01	+ 1.0
	24	P.	+ 0.17	+ 2.8
Oct.	2	E.	+ 0.02	+ 3.0
	8	Sk.	− 0.04	+ 3.2
	9	P.	− 0.03	+ 3.8
	13	Sk.	− 0.03	+ 2.2
Nov.	8	P.	+ 0.06	+ 2.5
	10	E.	+ 0.13	+ 3.9
	11	P.	+ 0.10	+ 2.5
	12	F.	− 0.09	+ 1.0
	16	P.	. .	+ 2.3
	18	E.	+ 0.03	+ 1.4
	21	Sk.	− 0.01	+ 1.1
	30	E.	+ 0.07	+ 1.5
Mean			+ 0.006	+ 2.42
Div., Flex., etc. .			. .	− 0.31

α BOOTIS (Ref.).

1875.			s.	″
May	31	E.	. .	+ 3.2
June	4	E.	. .	+ 1.2
	9	E.	− 0.01	+ 1.5
Mean			− 0.010	+ 1.97
Div., Flex., etc. .			. .	+ 0.66

θ BOOTIS.

	h.	m.	s.
Right Ascension . . .	14	20	56.444
North-Polar Distance .	37°	34′	14″.33

1875.			s.	″
May	31	E.	+ 0.02	+ 2.3
June	26	F.	+ 0.03	+ 2.5
Sept.	11	F.	0.00	+ 0.5
Oct.	7	F.	. .	− 0.8
Nov.	12	F.	+ 0.21	+ 1.2
Mean			+ 0.065	+ 1.14
Div., Flex., etc. .			. .	− 0.99

θ BOOTIS (Ref.).

1875.			s.	″
April	21	E.	. .	+ 2.7
June	9	F.	. .	− 1.0
Mean			. .	+ 0.85
Div., Flex., etc. .			. .	+ 1.42

5 URSÆ MINORIS.

	h.	m.	s.
Right Ascension . . .	14	27	48.777
North-Polar Distance .	13°	44′	55″.60

1875.			s.	″
April	20	Sk.	+ 0.05	0.0
May	11	E.	− 0.46	− 0.5
	18	Sk.	− 0.24	. .
June	16	E.	+ 0.09	+ 0.2
July	8	E.	+ 0.03	− 0.6
Nov.	8	P.	− 0.27	− 0.2
	11	P.	− 0.13	0.0
	12	F.	− 0.43	+ 0.4
Mean			− 0.170	− 0.10
Div., Flex., etc. .			. .	− 1.20

5 URSÆ MINORIS (Ref.).

1875.			s.	″
April	21	E.	. .	− 2.0
Div., Flex., etc. .			. .	+ 1.59

5 URSÆ MINORIS, S. P.

	h.	m.	s.
Right Ascension . . .	14	27	48.777
North-Polar Distance .	346°	15′	4″.40

1875.			s.	″
Nov.	2	P.	− 0.03	+ 3.3
	10	Sk.	− 0.12	+ 2.0
	12	P.	+ 0.02	+ 2.1
	17	P.	− 0.29	+ 1.7
	24	F.	− 0.41	+ 2.2
	27	F.	− 0.28	+ 2.3
Dec.	2	F.	− 0.99	+ 1.8
	13	E.	+ 0.10	+ 1.7
	20	P.	− 0.29	+ 2.6
Mean			− 0.254	+ 2.19
Div., Flex., etc. .			. .	− 1.31

ε BOOTIS.

	h.	m.	s.
Right Ascension . . .	14	39	31.710
North-Polar Distance .	62°	23′	51″.26

1875.			s.	″
April	20	Sk.	− 0.08	+ 2.2
	21	E.	− 0.01	+ 1.9
May	4	F.	− 0.01	+ 1.6
	11	E.	− 0.19	+ 2.3
	12	F.	− 0.02	+ 1.2
	17	F.	− 0.07	+ 1.8
	18	Sk.	+ 0.11	. .
June	9	F.	− 0.06	+ 2.4
	13	F.	− 0.01	+ 1.5
	26	F.	− 0.01	+ 1.9
Oct.	2	E.	− 0.05	+ 2.4
	8	Sk.	− 0.05	+ 3.3
	9	P.	− 0.01	+ 2.7
	13	Sk.	− 0.07	+ 3.3
	20	P.	+ 0.07	+ 3.0
	25	Sk.	+ 0.08	+ 4.4
Nov.	2	P.	− 0.10	. .
	12	F.	− 0.02	+ 3.8
	16	P.	+ 0.06	+ 2.1
	18	E.	− 0.05	+ 2.2
	21	Sk.	− 0.12	− 0.7
	29	Sk.	+ 0.05	+ 2.6
Dec.	12	E.	− 0.07	+ 1.7
Mean			− 0.027	+ 2.27
Div., Flex., etc. .			. .	− 0.07

α^2 Libræ.

	h.	m.	s.
Right Ascension . . .	14	43	57.935
North-Polar Distance .	105°	31′	14″.49

1875.			s.	″
Feb.	22	S.	0.00	+ 2.3
April	20	Sk.	+ 0.08	+ 2.2
	21	E.	+ 0.03	+ 0.5
May	4	F.	+ 0.06	+ 2.2
	11	E.	− 0.02	+ 2.5
	17	F.	+ 0.13	+ 2.2
June	9	F.	− 0.04	+ 3.3
	13	F.	+ 0.03	+ 2.3
	26	F.	+ 0.10	+ 2.6
Oct.	8	Sk.	+ 0.16	. .
Dec.	12	E.	+ 0.03	+ 5.9
Mean			+ 0.051	+ 2.60
Div., Flex., etc. .			. .	− 0.04

β Ursæ Minoris.

	h.	m	s.
Right Ascension. . .	14	51	5.397
North-Polar Distance .	15°	20′	2″.66

1875.			s.	″
May	19	E.	− 0.14	+ 0.7
June	9	F.	. .	+ 0.7
July	8	E.	+ 0.12	+ 0.5
Oct.	13	Sk.	+ 0.20	+ 1.5
	28	P.	− 0.38	+ 0.5
Nov.	8	P.	− 0.76	− 2.4
	11	P.	+ 0.10	0.0
	12	F.	− 0.46	+ 2.0
Dec.	12	E.	+ 0.11	+ 0.9
Mean			− 0.151	+ 0.49
Div., Flex., etc. .			. .	− 1.23

β Ursæ Minoris (Ref.).

1875.			s.	″
April	21	E.	. .	− 2.8
June	9	F.	. .	− 4.1
Mean			. .	− 3.45
Div., Flex., etc. .			. .	+ 1.61

β Ursæ Minoris, S. P.

	h.	m.	s.
Right Ascension. . .	14	51	5.397
North-Polar Distance .	344°	39′	57″.34

1875.			s.	″
May	31	F.	+ 0.51	+ 2.5
Oct.	27	F.	+ 0.75	+ 3.0
Nov.	12	P.	+ 0.01	+ 1.5
	27	F.	− 0.34	+ 1.3
Mean			+ 0.232	+ 2.08
Div., Flex., etc. .			. .	− 1.33

β Bootis.

	h.	m.	s.
Right Ascension. . .	14	57	14.248
North-Polar Distance .	49°	6′	55″.39

1875.			s.	″
May	19	E.	− 0.03	+ 2.1
Aug.	9	P.	+ 0.04	+ 2.1
Nov.	16	P.	+ 0.14	+ 2.7
	29	Sk.	+ 0.08	+ 1.5
Dec.	12	E.	+ 0.26	+ 3.2
	22	F.	+ 0.05	− 0.3
Mean			+ 0.090	+ 1.88
Div., Flex., etc. .			. .	− 0.52

β Libræ.

	h.	m.	s.
Right Ascension. . .	15	10	16.935
North-Polar Distance .	98°	55′	11″.51

1875.			s.	″
May	19	E.	− 0.01	+ 4.3
June	9	F.	. .	+ 3.2
Aug.	9	P.	+ 0.06	+ 2.6
Nov.	2	P.	+ 0.21	+ 1.2
Dec.	12	E.	+ 0.06	+ 3.5
	22	F.	. .	+ 0.8
Mean			+ 0.080	+ 2.60
Div., Flex., etc. .			. .	− 0.11

β Libræ (Ref.).

1875.			s.	″
June	9	F.	. .	− 2.1
	13	F.	. .	+ 1.2
Mean			. .	− 0.45
Div., Flex., etc. .			. .	+ 0.69

μ^1 Bootis.

	h.	m.	s.
Right Ascension. . .	15	19	46.163
North-Polar Distance .	62°	10′	59″.71

1875.			s.	″
May	19	E.	− 0.03	+ 4.3
	28	F.	− 0.15	+ 1.0
June	9	F.	. .	+ 2.7
	13	F.	− 0.10	+ 2.9
Aug.	9	P.	− 0.05	+ 3.5
Oct.	20	P.	− 0.01	+ 3.0
Dec.	12	E.	+ 0.07	+ 2.7
	22	F.	− 0.11	+ 0.8
Mean			− 0.054	+ 2.61
Div., Flex., etc. .			. .	− 0.07

γ^2 Ursæ Minoris.

	h.	m.	s.
Right Ascension. . .	15	20	56.493
North-Polar Distance .	17°	43′	15″.87

1875.			s.	″
May	19	E.	− 0.17	+ 5.0
July	8	E.	− 0.05	+ 2.7
Oct.	21	Sk.	+ 0.23	+ 4.5
	27	F.	− 0.01	+ 1.6
Nov.	9	P.	+ 0.38	+ 1.4
	12	P.	− 0.22	− 1.3
	16	P.	− 0.02	0.0
Dec.	15	P.	+ 0.17	+ 2.3
	17	F.	− 0.15	+ 1.9
Mean			+ 0.018	+ 2.01
Div., Flex., etc. .			. .	− 1.28

γ^2 Ursæ Minoris, S. P.

	h.	m.	s.
Right Ascension. . .	15	20	56.493
North Polar Distance .	342°	16′	44″.13

1875.			s.	″
Jan.	16	F.	− 0.02	− 1.0
June	16	F.	+ 0.05	− 0.3
Oct.	4	P.	− 0.41	+ 0.1
Nov.	12	P.	− 0.16	+ 0.8
Mean			− 0.135	− 0.10
Div., Flex., etc. .			. .	− 1.27

α Coronæ Borealis.

	h.	m.	s.
Right Ascension. . .	15	29	23.754
North-Polar Distance .	62°	51′	47″.31

1875.			s.	″
Feb.	26	S.	− 0.03	+ 1.7
April	22	F.	− 0.04	+ 0.2
May	19	E.	− 0.07	+ 2.7
June	13	F.	. .	+ 2.6
	16	E.	− 0.05	+ 1.3
July	1	Sk.	+ 0.03	+ 1.9
	8	E.	− 0.13	+ 2.7
Oct.	2	E.	+ 0.01	+ 3.2
	7	F.	. .	+ 0.7
	9	P.	− 0.09	+ 1.9
	13	Sk.	0.00	+ 3.1
	20	P.	− 0.02	+ 3.1
	21	Sk.	+ 0.04	+ 3.6
	25	Sk.	0.00	+ 1.9
	27	F.	− 0.03	+ 1.1
	28	P.	− 0.02	+ 0.7
Nov.	2	P.	− 0.06	− 0.6
	6	Sk.	− 0.03	+ 0.7
	9	P.	− 0.10	+ 0.1
	29	Sk.	(+ 0.17)	+ 2.2
Dec.	1	F.	+ 0.02	0.0
	12	P.	− 0.04	+ 1.5
	15	P.	− 0.06	+ 1.7
	17	F.	− 0.08	+ 0.8
	20	E.	− 0.04	+ 2.9
	22	F.	(− 0.26)	+ 1.4
Mean			− 0.036	+ 1.66
Div., Flex., etc. .			. .	− 0.09

α Coronæ Borealis (Ref.).

1875.			s.	″
June	13	F.	. .	+ 0.2
Div., Flex., etc. .			. .	+ 0.64

α Serpentis.

	h.	m.	s.
Right Ascension. . .	15	38	6.688
North-Polar Distance .	83°	10′	45″.85

1875.			s.	″
April	22	F.	+ 0.03	+ 1.3
June	16	E.	+ 0.02	+ 4.2
July	1	Sk.	− 0.01	+ 1.7
	8	E.	− 0.05	+ 3.4
	13	F.	+ 0.04	+ 1.8
Aug.	9	P.	− 0.02	+ 1.7
Oct.	2	E.	+ 0.04	+ 3.6
	7	F.	− 0.02	+ 2.0
	13	Sk.	+ 0.06	+ 3.5
	20	P.	+ 0.01	+ 3.8
	21	Sk.	+ 0.10	+ 4.6
	25	Sk.	+ 0.04	+ 3.0
	27	F.	+ 0.08	+ 1.1
	28	P.	+ 0.04	+ 0.4
Nov.	2	P.	+ 0.04	+ 1.8
	6	Sk.	+ 0.06	+ 1.9
	9	P.	+ 0.06	+ 1.3
	29	Sk.	+ 0.11	+ 1.7
Dec.	1	F.	+ 0.10	+ 0.3
	12	E.	+ 0.03	+ 2.0
	17	F.	+ 0.07	+ 1.9
	20	E.	+ 0.01	+ 1.2
	22	F.	− (0.18)	+ 2.3
Mean			+ 0.038	+ 2.20
Div., Flex., etc. .			. .	− 0.24

ε Serpentis.

	h.	m.	s.
Right Ascension. . .	15	44	35.177
North-Polar Distance .	85°	8′	39″.72

1875.			s.	″
Feb.	26	S.	. .	+ 1.0
April	22	F.	− 0.03	+ 0.9

ε Serpentis—Continued.

1875.			s.	″
June	16	E.	+ 0.02	+ 2.0
July	8	E.	− 0.04	+ 2.5
	13	F.	− 0.02	+ 2.4
Aug.	9	P.	− 0.02	+ 1.7
Oct.	2	E.	. .	+ 3.8
	7	F.	− 0.05	+ 1.7
	13	Sk.	+ 0.05	. .
	27	F.	+ 0.13	+ 1.2
Nov.	2	P.	− 0.01	− 0.6
Dec.	15	P.	+ 0.05	+ 2.1
Mean			+ 0.008	+ 1.70
Div., Flex., etc. .			. .	− 0.09

ζ Ursæ Minoris.

	h.	m.	s.
Right Ascension . . .	15	48	33.922
North-Polar Distance .	11°	49′	19″.12

1875.			s.	″
July	8	E.	− 0.12	− 0.4
Nov.	12	P.	− 0.04	+ 0.2
Dec.	15	P.	− 0.03	. .
Mean			− 0.063	− 0.10
Div., Flex., etc. .			. .	− 1.21

ζ Ursæ Minoris, S. P.

	h.	m.	s.
Right Ascension . . .	15	48	33.922
North-Polar Distance .	348°	10′	40″.88

1875.			s.	″
Nov.	12	P.	+ 0.06	− 0.3
Div., Flex., etc. .			. .	− 1.35

ε Coronæ Borealis.

	h.	m.	s.
Right Ascension . . .	15	52	24.869
North-Polar Distance .	62°	45′	30″.66

1875.			s.	″
June	13	F.	− 0.09	+ 2.3
Dec.	20	E.	− 0.15	+ 1.1
Mean			− 0.120	+ 1.70
Div., Flex., etc. .			. .	− 0.08

δ Scorpii.

	h.	m.	s.
Right Ascension . . .	15	52	56.672
North-Polar Distance .	112°	15′	48″.68

1875.			s.	″
Feb.	26	S.	+ 0.11	+ 3.3
	27	Sk.	− 0.05	+ 3.7
July	30	E.	+ 0.03	+ 4.4
Oct.	2	E.	+ 0.04	+ 4.4
Nov.	2	P.	+ 0.06	+ 1.7
Dec.	15	P.	− 0.06	. .
Mean			+ 0.022	+ 3.50
Div., Flex., etc. .			. .	+ 0.06

β′ Scorpii.

	h.	m.	s.
Right Ascension . . .	15	58	10.219
North-Polar Distance .	109°	27′	40″.91

β′ Scorpii—Continued.

1875.			s.	″
Feb.	26	S.	(+ 0.24)	+ 1.2
	27	Sk.	+ 0.09	+ 1.8
July	14	E.	+ 0.04	+ 1.3
	30	E.	+ 0.04	+ 1.6
Nov.	2	P.	. .	+ 1.6
Mean			+ 0.057	+ 1.50
Div., Flex., etc. .			. .	− 0.07

Groombridge 2320.

	h.	m.	s.
Right Ascension . . .	16	5	59.128
North-Polar Distance .	21°	51′	37″.55

1875.			s.	″
July	1	Sk.	+ 0.69	+ 0.3
	14	E.	+ 0.19	+ 1.9
Mean			+ 0.440	+ 1.10
Div., Flex., etc. .			. .	− 1.19

Groombridge 2320, S. P.

	h.	m.	s.
Right Ascension . . .	16	5	59.128
North-Polar Distance .	338°	8′	22″.45

1875.			s.	″
Feb.	17	F.	+ 0.18	. .
Oct.	4	P.	+ 0.09	+ 0.4
Nov.	2	P.	+ 0.25	+ 1.5
Mean			+ 0.173	+ 0.95
Div., Flex., etc. .			. .	− 1.13

δ Ophiuchi.

	h.	m.	s.
Right Ascension . . .	16	7	47.754
North-Polar Distance .	93°	22′	13″.56

1875.			s.	″
Feb.	27	Sk.	+ 0.10	+ 1.8
July	14	E.	+ 0.04	+ 2.9
	30	E.	+ 0.01	+ 4.2
Nov.	11	E.	+ 0.09	+ 4.3
Dec.	19	P.	+ 0.15	+ 0.5
	20	E.	+ 0.04	+ 1.3
Mean			+ 0.072	+ 2.50
Div., Flex., etc. .			. .	+ 0.06

δ Ophiuchi (Ref.).

1875.			s.	″
Feb.	26	S.	. .	+ 2.0
Div., Flex., etc. .			. .	+ 0.87

τ Herculis.

	h.	m.	s.
Right Ascension . . .	16	15	58.913
North-Polar Distance .	43°	23′	16″.86

1875.			s.	″
July	13	F.	+ 0.04	+ 0.9
	14	E.	+ 0.13	+ 1.2
Aug.	9	P.	+ 0.22	+ 0.7
Nov.	11	E.	+ 0.23	+ 0.9
Dec.	19	P.	+ 0.23	+ 0.2
	20	E.	+ 0.25	+ 1.1
Mean			+ 0.183	+ 0.83
Div., Flex., etc. .			. .	− 0.89

α Scorpii.

	h.	m.	s.
Right Ascension . . .	16	21	44.755
North-Polar Distance .	116°	9′	8″.54

1875.			s.	″
May	31	E.	− 0.06	+ 2.0
June	13	F.	− 0.15	+ 0.6
July	7	F.	− 0.07	+ 0.2
	13	F.	− 0.01	+ 1.7
Aug.	26	Sk.	− 0.01	+ 1.2
Oct.	25	Sk.	− 0.08	+ 2.9
Dec.	15	P.	+ 0.05	+ 1.3
	19	P.	+ 0.06	+ 0.3
	20	E.	+ 0.04	+ 1.7
Mean			− 0.026	+ 1.32
Div., Flex., etc. .			. .	+ 0.18

η Draconis.

	h.	m.	s.
Right Ascension . . .	16	22	18.184
North-Polar Distance .	28°	12′	8″.90

1875.			s.	″
June	4	E.	− 0.03	+ 0.3
Nov.	11	E.	− 0.03	+ 1.5
Mean			− 0.030	+ 0.90
Div., Flex., etc. .			. .	− 1.04

A Draconis.

	h.	m.	s.
Right Ascension . . .	16	28	14.242
North-Polar Distance .	20°	57′	41″.32

1875.			s.	″
June	4	E.	− 0.07	+ 0.9
Aug.	9	P.	− 0.17	+ 1.4
Nov.	12	P.	− 0.05	+ 0.6
Dec.	19	P.	+ 0.04	+ 2.6
Mean			− 0.062	+ 1.38
Div., Flex., etc. .			. .	− 1.23

A Draconis, S. P.

	h.	m.	s.
Right Ascension . . .	16	28	14.242
North-Polar Distance .	339°	2′	18″.68

1875.			s.	″
Nov.	12	P.	− 0.33	− 0.8
	29	P.	− 0.27	+ 3.7
Mean			− 0.300	+ 1.45
Div., Flex., etc. .			. .	− 1.18

ζ Ophiuchi.

	h.	m.	s.
Right Ascension . . .	16	30	16.621
North-Polar Distance .	100°	18′	41″.91

1875.			s.	″
May	31	E.	− 0.05	+ 3.1
June	13	F.	+ 0.03	+ 2.9
	19	Sk.	− 0.09	+ 1.9
July	7	F.	− 0.04	+ 5.7
	13	F.	+ 0.01	+ 2.6
Aug.	10	Sk.	0.00	+ 3.7
	26	Sk.	+ 0.03	+ 2.0
Oct.	25	Sk.	+ 0.15	. .
Nov.	11	E.	. .	+ 3.8
Dec.	17	F.	+ 0.04	+ 1.8
Mean			+ 0.009	+ 3.06
Div., Flex., etc. .			. .	− 0.11

η HERCULIS.

	h.	m.	s.
Right Ascension . . .	16	38	36.662
	°	′	″
North-Polar Distance .	50	50	18.65

1875.			s.	″
May	31	E.	− 0.09	+ 2.9
June	13	F.	+ 0.03	+ 1.9
	19	Sk.	− 0.03	+ 0.9
July	7	F.	− 0.04	+ 3.1
	30	E.	+ 0.05	+ 2.2
Aug.	10	Sk.	+ 0.01	+ 2.2
	26	Sk.	+ 0.01	+ 2.2
	30	P.	0.00	+ 3.2
Oct.	25	Sk.	− 0.02	+ 3.0
Nov.	12	P.	− 0.01	+ 3.2
Dec.	15	P.	+ 0.03	+ 3.7
	17	F.	+ 0.02	+ 3.2
	19	P.	+ 0.14	+ 2.6
	20	E.	+ 0.07	+ 2.5
	26	Sk.	+ 0.10	. .
Mean			+ 0.018	+ 2.63
Div., Flex., etc. .			. .	− 0.37

κ OPHIUCHI.

	h.	m.	s.
Right Ascension . . .	16	51	45.078
	°	′	″
North-Polar Distance .	80	25	43.11

1875.			s.	″
June	4	E.	+ 0.06	+ 1.7
July	3	F.	+ 0.04	. .
	14	E.	+ 0.10	+ 2.3
Aug.	5	E.	+ 0.06	+ 4.1
	10	Sk.	− 0.02	+ 3.1
	17	P.	+ 0.05	+ 3.0
	25	P.	+ 0.10	+ 3.0
	30	P.	+ 0.07	+ 3.4
Sept.	7	F.	0.00	+ 2.7
	27	F.	+ 0.08	+ 3.3
Nov.	12	P.	+ 0.09	+ 4.0
Dec.	19	P.	+ 0.15	+ 2.2
	20	E.	+ 0.11	+ 3.9
Mean			+ 0.068	+ 3.06
Div., Flex., etc. .			. .	− 0.39

d HERCULIS.

	h.	m.	s.
Right Ascension . . .	16	56	59.326
	°	′	″
North-Polar Distance .	56	14	56.76

1875.			s.	″
July	14	E.	+ 0.21	+ 2.9
Aug.	5	P.	+ 0.06	+ 3.6
Mean			+ 0.135	+ 3.25
Div., Flex., etc. .			. .	+ 0.08

ε URSÆ MINORIS.

	h.	m.	s.
Right Ascension . . .	16	58	50.907
	°	′	″
North-Polar Distance .	7	45	37.23

1875.			s.	″
July	14	E.	. .	+ 1.7
	30	E.	− 0.21	+ 3.1
Aug.	9	P.	− 0.72	+ 1.1
	10	Sk.	− 0.18	+ 2.1
	25	P.	− 0.96	+ 2.4
	30	P.	− 1.15	+ 1.7
Sept.	7	F.	− 0.16	+ 1.7
Oct.	27	F.	+ 0.32	+ 0.3
Nov.	12	P.	+ 0.18	+ 1.6
Dec.	20	E.	+ 0.21	+ 2.5
Mean			− 0.297	+ 1.82
Div., Flex., etc. .			. .	− 1.18

ε URSÆ MINORIS, S. P.

	h.	m.	s.
Right Ascension . . .	16	58	50.907
	°	′	″
North-Polar Distance .	352	14	22.77

1875.			s.	″
Feb.	28	E.	+ 0.22	+ 1.5
Oct.	17	Sk.	− 0.27	+ 2.6
	28	P.	− 0.32	+ 1.0
Nov.	2	P.	− 0.29	. .
	5	P.	− 1.33	− 0.4
	12	P.	− 0.32	0.0
	29	P.	. .	+ 2.0
Dec.	12	P.	− 0.34	+ 0.1
	13	E.	− 0.49	+ 0.8
	19	Sk.	+ 0.25	+ 1.8
	20	P.	− 0.16	− 0.1
Mean			− 0.363	+ 0.93
Div., Flex., etc. .			. .	− 1.33

*a*¹ HERCULIS.

	h.	m.	s.
Right Ascension . . .	17	8	56.881
	°	′	″
North-Polar Distance .	75	27	55.18

1875.			s.	″
Mar.	27	Sk.	− 0.14	+ 3.2
June	4	E.	− 0.03	− 0.2
July	14	E.	− 0.04	+ 3.0
Aug.	5	E.	− 0.05	+ 4.0
	17	P.	+ 0.01	+ 1.7
	25	P.	+ 0.03	+ 3.5
	30	P.	+ 0.05	+ 3.2
Sept.	7	F.	− 0.03	+ 1.3
	8	P.	+ 0.10	+ 2.4
Oct.	27	F.	− 0.05	+ 1.8
Nov.	11	E.	+ 0.05	+ 4.4
	12	P.	− 0.02	+ 2.3
Dec.	17	F.	− 0.01	+ 2.5
	20	E.	+ 0.04	+ 3.2
Mean			− 0.006	+ 2.59
Div., Flex., etc. .			. .	− 0.36

44 OPHIUCHI.

	h.	m.	s.
Right Ascension . . .	17	18	44.237
	°	′	″
North-Polar Distance .	114	3	26.81

1875.			s.	″
June	9	F.	+ 0.05	+ 2.0
Aug.	9	P.	. .	+ 1.8
Sept.	7	F.	− 0.02	+ 0.7
	8	P.	+ 0.04	+ 2.6
Mean			+ 0.023	+ 1.78
Div., Flex., etc. .			. .	+ 0.14

β DRACONIS.

	h.	m.	s.
Right Ascension . . .	17	27	36.478
	°	′	″
North-Polar Distance .	37	36	19.68

1875.			s.	″
Jan.	19	F.	. .	− 2.7
Oct.	27	F.	+ 0.12	− 0.2
Nov.	11	E.	+ 0.04	+ 0.5
	12	P.	+ 0.06	+ 0.6
Mean			+ 0.073	− 0.45
Div., Flex., etc. .			. .	− 0.99

α OPHIUCHI.

	h.	m.	s.
Right Ascension . . .	17	29	7.918
	°	′	″
North-Polar Distance .	77	20	49.46

1875.			s.	″
June	4	E.	+ 0.01	− 0.4
July	14	E.	0.00	+ 2.4
Aug.	5	E.	+ 0.05	+ 2.8
	20	P.	+ 0.26	+ 2.5
	25	P.	− 0.07	+ 3.0
Sept.	7	F.	− 0.06	+ 1.0
Oct.	27	F.	+ 0.05	+ 1.8
Nov.	2	P.	+ 0.10	+ 1.9
	11	E.	+ 0.06	+ 3.2
	12	P.	+ 0.05	+ 1.6
	17	P.	+ 0.07	+ 1.7
Dec.	26	Sk.	+ 0.18	+ 2.7
Mean			+ 0.058	+ 2.02
Div., Flex., etc. .			. .	− 0.34

ω DRACONIS.

	h.	m.	s.
Right Ascension . . .	17	37	41.121
	°	′	″
North-Polar Distance .	21	11	6.05

1875.			s.	″
Nov.	12	P.	− 0.04	− 1.2
Div., Flex., etc. .			. .	− 1.22

ω DRACONIS, S. P.

	h.	m.	s.
Right Ascension . . .	17	37	41.121
	°	′	″
North-Polar Distance .	338	48	53.95

1875.			s.	″
Nov	12	P.	+ 0.18	+ 1.7
Div., Flex., etc. .			. .	− 1.17

μ¹ HERCULIS.

	h.	m.	s.
Right Ascension . . .	17	41	34.012
	°	′	″
North-Polar Distance .	62	12	16.33

1875.			s.	″
Jan.	19	F.	− 0.03	+ 0.5
Feb.	27	Sk.	+ 0.06	+ 1.2
Mar.	27	Sk.	− 0.14	+ 3.7
July	3	F.	− 0.03	+ 3.6
	7	F.	0.00	+ 5.5
	30	E.	− 0.07	+ 2.4
Aug.	25	P.	− 0.17	+ 4.2
	30	P.	− 0.17	+ 3.4
Oct.	5	Sk.	− 0.01	+ 3.1
Nov.	2	P.	+ 0.02	+ 2.0
	11	E.	− 0.07	+ 3.3
	12	P.	− 0.04	+ 1.4
	17	P.	. .	+ 1.7
	22	Sk.	− 0.03	+ 3.0
	26	Sk.	+ 0.02	+ 4.2
Mean			− 0.047	+ 2.88
Div., Flex., etc. .			. .	− 0.07

ψ¹ DRACONIS.

	h.	m.	s.
Right Ascension . . .	17	44	9.884
	°	′	″
North-Polar Distance .	17	47	25.20

1875.			s.	″
Nov.	12	P.	− 0.12	+ 2.0
Div., Flex., etc. .			. .	− 1.28

ψ¹ Draconis, S. P.

	h.	m.	s.
Right Ascension. . . .	17	44	9.884
North-Polar Distance .	342°	12′	34″.80

1875.			s.	″
Nov.	12	P.	+ 0.08	− 0.1
Div., Flex., etc. .			. .	− 1.27

γ Draconis.

	h.	m.	s.
Right Ascension. . . .	17	53	42.370
North-Polar Distance .	38°	29′	44″.56

1875.			s.	″
Jan.	19	F.	− 0.16	− 1.1
July	5	E.	− 0.06	+ 2.5
Aug.	20	P.	+ 0.07	+ 2.4
Oct.	2	E.	0.00	+ 1.9
Nov.	2	P.	− 0.24	− 1.0
	11	E.	− 0.21	+ 1.8
	12	P.	− 0.11	0.0
	17	P.	− 0.07	− 0.6
Mean			− 0.098	+ 0.74
Div., Flex., etc. .			. .	− 0.97

γ² Sagittarii.

	h.	m.	s.
Right Ascension. . . .	17	57	46.724
North-Polar Distance .	120°	25′	23″.71

1875.			s.	″
Feb.	27	Sk.	+ 0.17	− 1.7
Mar.	27	Sk.	+ 0.08	+ 0.6
Apr.	24	Sk.	− 0.13	+ 0.5
July	3	F.	− 0.02	+ 0.3
	7	F.	+ 0.02	− 1.2
	29	Sk.	− 0.18	− 0.1
Aug.	5	P.	+ 0.02	+ 0.3
	21	P.	− 0.14	− 0.8
Sept.	8	P.	− 0.07	− 0.6
	24	P.	+ 0.06	+ 0.7
Oct.	2	E.	− 0.04	− 0.8
	5	Sk.	− 0.02	+ 0.8
	12	P.	+ 0.02	− 1.5
Mean			− 0.018	− 0.27
Div., Flex., etc. .			. .	+ 0.24

μ¹ Sagittarii.

	h.	m.	s.
Right Ascension. . . .	18	6	17.271
North-Polar Distance .	111°	5′	20″.98

1875.			s.	″
July	3	F.	0.00	+ 2.6
	7	F.	+ 0.06	+ 1.3
Oct.	2	E.	− 0.03	+ 1.4
Mean			+ 0.010	+ 1.77
Div., Flex., etc. .			. .	0.00

δ Ursæ Minoris.

	h.	m.	s.
Right Ascension. . . .	18	12	39.317
North-Polar Distance .	3°	23′	32″.59

1875.			s.	″
Jan.	13	Sk.	− 0.87	− 1.2
	14	E.	− 0.53α	− 2.2
Feb.	27	Sk.	− 0.65	. .
Mar.	27	Sk.	− 0.74α	+ 2.1
April	24	Sk.	− 0.15, 51	+ 0.9
May	22	Sk.	− 0.35α, 51	. .

δ Ursæ Minoris—Continued.

1875.			s.	″
June	19	Sk.	. .	− 4.1
July	3	F.	. .	+ 2.4
	7	F.	− 0.21, 51	+ 3.7
	16	F.	. .	+ 0.7
	30	E.	+ 0.60, 51	+ 5.0
Aug.	5	E.	+ 0.28, 51	+ 1.9
	5	P.	. .	+ 2.3
	9	P.	+ 0.39α, 51	+ 0.8
	21	P.	− 0.23α, 51, λ	. .
Oct.	2	E.	+ 0.46α, 51	+ 1.0
	13	Sk.	− 1.21α, 51	. .
Nov.	11	E.	. .	+ 0.9
	11	P.	. .	+ 0.6
	12	P.	+ 0.25	+ 0.3
	17	P.	− 1.58	− 0.9
Dec.	21	E.	. .	− 2.3
Mean			. .	+ 0.66
Div., Flex., etc. .			. .	− 1.05

δ Ursæ Minoris, S. P.

	h.	m.	s.
Right Ascension. . . .	18	12	39.317
North-Polar Distance .	356°	36′	27″.41

1875.			s.	″
Jan.	14	Sk.	− 0.54	+ 0.9
	22	Sk.	. .	+ 1.5
Feb.	1	F.	. .	+ 1.1
	4	E.	+ 0.35, 51	+ 3.7
	5	F.	+ 0.61, 51	+ 1.4
	11	Sk.	− 0.37, 51	+ 1.1
	12	E.	+ 0.47, 51	+ 1.7
	13	F.	− 0.31, 51	+ 0.6
	14	S.	+ 0.66, 51	+ 2.4
	15	Sk.	. .	+ 1.9
	16	E.	− 0.77, 51	+ 1.1
	17	F.	− 0.35, 51	. .
	22	S.	+ 1.88	. .
	26	S.	− 0.31α, 51	+ 0.9
	27	Sk.	− 0.16	+ 0.1
Mar.	4	E.	+ 0.58α, 51	+ 2.2
	8	E.	+ 0.72α, 51	+ 2.2
July	29	Sk.	− 0.05λ	. .
Oct.	17	Sk.	. .	+ 2.1
	19	F.	− 0.81, 51	+ 0.5
	21	Sk.	+ 0.48, 51, λ	. .
Nov.	12	P.	+ 0.13	+ 0.7
	14	Sk.	. .	+ 0.3
Dec.	12	P.	− 0.27λ	+ 0.6
	13	E.	+ 0.03, 51	. .
	20	P.	− 1.16	+ 1.1
Mean			. .	+ 1.33
Div., Flex., etc. .			. .	− 1.13

η Serpentis.

	h.	m.	s.
Right Ascension. . . .	18	14	50.445
North-Polar Distance .	92°	55′	44″.58

1875.			s.	″
Jan.	19	F.	+ 0.18	+ 2.7
Feb.	21	S.	+ 0.19	+ 1.9
Mar.	27	Sk.	+ 0.07	+ 2.8
July	3	F.	+ 0.12	+ 5.1
	7	F.	+ 0.13	+ 4.0
	16	F.	+ 0.09	+ 2.8
	30	E.	+ 0.10	+ 3.7
Aug.	21	P.	+ 0.09	+ 2.4
Oct.	2	E.	+ 0.13	+ 3.9
Nov.	2	P.	+ 0.14	+ 2.8
	12	P.	+ 0.10	+ 2.7
	22	Sk.	+ 0.06	+ 1.5
Dec.	2	F.	+ 0.34	. .
Mean			+ 0.134	+ 3.02
Div., Flex., etc. .			. .	+ 0.05

ι Aquilæ.

	h.	m.	s.
Right Ascension. . . .	18	28	24.226
North-Polar Distance .	98°	19′	45″.28

1875.			s.	″
July	16	F.	+ 0.05	+ 1.9
Aug.	9	P.	+ 0.07	+ 1.1
Sept.	7	F.	+ 0.09	+ 1.1
	20	P.	+ 0.06	+ 1.7
	24	P.	+ 0.06	+ 2.4
Oct.	2	E.	+ 0.08	+ 2.0
Mean			+ 0.068	+ 1.70
Div., Flex., etc. .			. .	− 0.07

α Lyræ.

	h.	m.	s.
Right Ascension. . . .	18	32	42.370
North-Polar Distance .	51°	19′	53″.36

1875.			s.	″
Jan.	10	E.	− 0.04	− 0.8
	13	Sk.	− 0.02	− 1.4
	14	E.	+ 0.01	− 0.2
	19	F.	+ 0.04	+ 0.1
	26	E.	0.00	. .
	31	F.	0.00	. .
Feb.	7	E.	− 0.01	+ 0.2
	11	E.	− 0.08	+ 0.5
	21	S.	+ 0.03	− 1.1
	25	S.	− 0.11	− 1.0
April	24	Sk.	+ 0.04	− 0.5
May	22	Sk.	− 0.10	. .
June	19	Sk.	− 0.16	− 0.9
July	7	F.	− 0.04	+ 1.2
	16	F.	+ 0.04	+ 0.7
	30	E.	− 0.04	+ 2.3
Aug.	10	Sk.	− 0.09	+ 0.9
	20	P.	− 0.02	+ 2.0
	21	P.	+ 0.08	+ 1.5
	26	Sk.	− 0.17	+ 0.7
	31	F.	− 0.05	+ 3.1
Sept.	1	P.	+ 0.07	− 1.0
	4	P.	− 0.07	+ 1.0
	8	P.	− 0.02	+ 0.8
	21	F.	− 0.04	+ 1.1
	24	P.	− 0.06	+ 0.5
	27	F.	− 0.02	+ 1.8
Oct.	2	E.	− 0.02	+ 2.3
	5	Sk.	+ 0.09	+ 0.8
	13	Sk.	0.00	+ 1.2
	30	Sk.	+ 0.05	. .
Dec.	1	E.	+ 0.07	+ 1.7
	2	F.	+ 0.15	+ 0.8
	21	E.	− 0.10	− 1.3
Mean			− 0.017	+ 0.57
Div., Flex., etc. .			. .	− 0.33

β Lyræ.

	h.	m.	s.
Right Ascension. . . .	18	45	27.883
North-Polar Distance .	56°	46′	52″.25

1875.			s.	″
Jan.	10	E.	+ 0.10	+ 1.1
	13	Sk.	+ 0.06	− 0.5
	14	E.	+ 0.13	− 1.1
	19	F.	− 0.02	+ 1.1
	26	E.	+ 0.05	. .
	31	F.	+ 0.16	. .
Feb.	11	E.	− 0.02	+ 0.8
	21	S.	+ 0.09	− 1.5
	25	S.	− 0.02	− 1.0
April	24	Sk.	+ 0.02	+ 2.5
May	22	Sk.	0.00	. .
June	19	Sk.	− 0.01	− 0.4
July	16	F.	0.00	+ 0.7
	29	Sk.	+ 0.13	+ 1.4

β Lyræ—Continued.

1875.			s.	″
Aug.	10	Sk.	− 0.02	+ 0.4
	21	P.	+ 0.04	+ 1.0
	26	Sk.	− 0.09	+ 0.5
Sept.	21	F.	+ 0.04	− 1.2
	24	P.	− 0.02	+ 0.6
Oct.	9	P.	+ 0.04	+ 1.2
Dec.	1	E.	− 0.05	+ 1.5
	13	E.	− 0.03	+ 3.3
Mean			− 0.026	+ 0.55
Div., Flex., etc. .			. .	+ 0.04

σ Sagittarii.

	h.	m.	s.
Right Ascension . . .	18	47	30.839
	°	′	″
North-Polar Distance .	116	26	57.87

1875.			s.	″
Feb.	25	S.	+ 0.38	− 0.5
Div., Flex., etc. .			. .	+ 0.19

50 Draconis.

	h.	m.	s.
Right Ascension . . .	18	50	23.620
	°	′	″
North-Polar Distance .	14	42	53.51

1875.			s.	″
April	24	Sk.	+ 0.33	− 0.8
Div., Flex., etc. .			. .	− 1.22

50 Draconis, S. P.

	h.	m.	s.
Right Ascension . . .	18	50	23.620
	°	′	″
North-Polar Distance .	345	17	6.49

1875.			s.	″
Feb.	16	E.	+ 0.68	+ 0.9
Mar.	4	E.	+ 0.68	+ 4.5
Mean			+ 0.680	+ 2.70
Div., Flex., etc. .			. .	− 1.32

ζ Aquilæ.

	h.	m.	s.
Right Ascension . . .	18	59	39.805
	°	′	″
North-Polar Distance .	76	19	13.86

1875.			s.	″
Jan.	13	Sk.	+ 0.18	+ 1.8
	14	E.	+ 0.31	+ 2.2
	19	F.	+ 0.17	+ 1.8
Feb.	11	E.	+ 0.10	+ 2.4
	21	S.	+ 0.09	+ 1.1
	25	S.	+ 0.16	− 0.3
April	24	Sk.	+ 0.21	+ 2.8
May	22	Sk.	+ 0.08	. .
July	16	F.	+ 0.11	+ 2.1
	29	Sk.	+ 0.15	+ 2.5
Aug.	20	P.	+ 0.13	+ 3.6
Sept.	1	P.	+ 0.04	+ 0.8
	4	P.	0.00	+ 3.2
	8	P.	+ 0.14	+ 1.7
	20	P.	+ 0.03	+ 2.9
	21	F.	+ 0.03	+ 2.2
	24	P.	+ 0.04	+ 2.1
	29	F.	+ 0.02	+ 2.1
Oct.	9	P.	+ 0.13	+ 3.2
	13	Sk.	+ 0.08	+ 2.7
Nov.	17	P.	+ 0.17	+ 1.8
Dec.	2	F.	+ 0.13	+ 0.5
	18	E.	+ 0.11	+ 2.3
Mean			+ 0.113	+ 2.08
Div., Flex., etc. .			. .	− 0.34

ζ Aquilæ (Ref.).

1875.			s.	″
Oct.	2	E.	. .	+ 1.3
Div., Flex , etc. .			. .	+ 0.70

d Sagittarii.

	h.	m.	s.
Right Ascension . . .	19	10	19.206
	°	′	″
North-Polar Distance .	109	10	20.60

1875.			s.	″
Sept.	8	P.	+ 0.04	+ 3.5
Oct.	2	E.	+ 0.07	+ 4.9
	7	F.	+ 0.01	+ 3.3
	9	P.	+ 0.11	+ 4.2
Mean			+ 0.058	+ 3.98
Div., Flex., etc. .			. .	− 0.08

δ Draconis.

	h.	m.	s.
Right Ascension . . .	19	12	31.273
	°	′	″
North-Polar Distance .	22	33	30.63

1875.			s.	″
Jan.	19	F.	+ 0.05	+ 0.2
Feb.	11	E.	− 0.17	+ 2.1
	15	E.	− 0.07	+ 2.3
	25	S.	− 0.34	− 0.3
Sept.	29	F.	− 0.10	+ 0.1
Oct.	5	Sk.	. .	+ 1.4
	9	P.	− 0.59	+ 1.3
Nov.	17	P.	0.00	− 0.8
Dec.	21	E.	− 0.10	− 0.2
Mean			− 0.165	+ 0.68
Div., Flex., etc. .			. .	− 1.15

δ Draconis (Ref.).

1875.			s.	″
Oct.	5	Sk.	. .	− 4.0
Div., Flex., etc. .			. .	+ 1.85

τ Draconis.

	h.	m.	s.
Right Ascension . . .	19	17	56.715
	°	′	″
North-Polar Distance .	16	52	38.64

1875.			s.	″
Aug.	26	Sk.	− 0.33	+ 1.2
Nov.	17	P.	− 0.08	+ 0.3
Mean			− 0.205	+ 0.75
Div., Flex., etc. .			. .	− 1.27

δ Aquilæ.

	h.	m.	s.
Right Ascension . . .	19	19	11.682
	°	′	″
North-Polar Distance .	87	7	57.04

1875.			s.	″
Feb.	11	E.	+ 0.10	+ 2.4
	25	S.	+ 0.21	− 0.3
Aug.	5	E.	+ 0.11	+ 3.9
	9	P.	+ 0.06	+ 2.8
	20	P.	+ 0.13	+ 4.1
Sept.	1	P.	+ 0.02	+ 0.2
	14	P.	. .	+ 1.2
	20	P.	+ 0.11	+ 2.4
	21	F.	+ 0.04	+ 2.1
	27	F.	+ 0.07	+ 1.6
Oct.	9	P.	+ 0.10	+ 1.6
	13	Sk.	+ 0.08	+ 1.7
Dec.	21	E.	+ 0.18	+ 4.1
	27	Sk.	+ 0.11	+ 3.2
Mean			+ 0.102	+ 2.21
Div., Flex., etc. .			. .	− 0.07

κ Aquilæ.

	h.	m.	s.
Right Ascension . . .	19	30	9.923
	°	′	″
North-Polar Distance .	97	18	11.16

1875.			s.	″
Aug.	5	P.	+ 0.13	+ 3.1
	31	F.	+ 0.13	+ 3.4
Oct.	21	F.	+ 0.08	+ 2.3
Nov.	17	P.	+ 0.14	+ 2.0
Mean			+ 0.120	+ 2.70
Div., Flex., etc. .			. .	− 0.01

γ Aquilæ.

	h.	m.	s.
Right Ascension . . .	19	40	18.997
	°	′	″
North-Polar Distance .	79	41	22.95

1875.			s.	″
Feb.	4	F.	+ 0.14	+ 0.5
	11	E.	+ 0.15	+ 3.1
	15	E.	+ 0.02	+ 2.3
	17	S.	+ 0.07	. .
	21	S.	+ 0.04	+ 0.4
	25	S.	+ 0.06	− 0.5
Aug.	5	E.	0.00	+ 2.4
	9	P.	− 0.04	+ 1.8
	20	P.	+ 0.06	+ 3.2
	31	F.	+ 0.07	+ 2.1
Sept.	14	P.	+ 0.03	+ 0.9
	20	P.	0.00	+ 2.0
	21	F.	0.00	+ 1.5
	24	P.	+ 0.01	+ 0.8
	25	F.	+ 0.02	+ 3.0
	29	F.	+ 0.02	+ 1.9
Oct.	7	F.	0.00	+ 1.6
	9	P.	− 0.02	+ 1.3
	13	Sk.	− 0.11	+ 3.4
	20	P.	+ 0.01	+ 1.8
	21	F.	− 0.01	− 0.1
Nov.	17	P.	+ 0.05	+ 0.3
Dec.	1	E.	0.00	+ 1.8
	2	F.	− 0.01	+ 0.7
	13	E.	+ 0.03	+ 5.2
	18	F.	− 0.02	+ 1.6
	20	P.	+ 0.01	+ 2.7
	21	E.	− 0.05	+ 3.3
	23	Sk.	+ 0.12	+ 1.9
	27	Sk.	+ 0.01	+ 1.9
Mean			+ 0.022	+ 1.82
Div., Flex., etc. .			. .	− 0.40

α Aquilæ.

	h.	m.	s.
Right Ascension . . .	19	44	41.029
	°	′	″
North-Polar Distance .	81	27	36.54

1875.			s.	″
Jan.	19	F.	− 0.07	+ 1.7
Feb.	4	F.	+ 0.13	. .
	7	E.	+ 0.08	+ 1.7
	11	E.	+ 0.06	+ 2.6
	14	Sk.	+ 0.05	+ 2.0
	15	E.	+ 0.02	+ 1.3
	17	S.	+ 0.08	. .
	21	S.	+ 0.03	+ 0.8
	25	S.	+ 0.13	− 0.7
Aug.	5	E.	+ 0.04	+ 3.3
	9	E.	− 0.09	+ 0.9
	20	P.	+ 0.03	+ 4.0
Sept.	14	P.	+ 0.06	+ 1.6
	25	F.	− 0.02	+ 2.9
	29	F.	− 0.01	+ 1.9
Oct.	2	E.	. .	+ 2.6
	5	Sk.	− 0.02	. .
	7	F.	+ 0.04	+ 1.9
	9	P.	+ 0.04	+ 2.3
	20	P.	+ 0.05	+ 2.4

α Aquilæ—Continued.

1875.			s.	″
Oct.	21	F.	+ 0.03	+ 1.9
Nov.	17	P.	+ 0.05	+ 1.3
Dec.	1	E.	− 0.07	+ 2.5
	2	F.	0.00	+ 2.8
	18	F.	+ 0.02	+ 1.5
	20	P.	+ 0.06	+ 3.0
	21	E.	− 0.06	+ 4.1
	23	Sk.	+ 0.11	+ 3.8
	27	Sk.	+ 0.04	+ 3.4
Mean			+ 0.029	+ 2.21
Div., Flex., etc. .			. .	− 0.36

α Aquilæ (Ref.).

1875.			s.	″
Oct.	2	E.	. .	+ 0.6
Div., Flex., etc. .			. .	+ 0.86

ε Draconis.

	h.	m.	s.
Right Ascension. . .	19	48	35.098
North-Polar Distance .	20°	3′	3″.02

1875.			s.	″
Nov.	17	P	+ 0.04	− 2.4
Div., Flex., etc. .			. .	− 1.28

β Aquilæ.

	h.	m.	s.
Right Ascension. . .	19	49	10.350
North-Polar Distance .	83°	54′	13″.51

1875.			s.	″
Aug.	5	P.	+ 0.10	+ 2.3
Oct.	7	F.	+ 0.08	+ 0.4
Dec.	2	F.	+ 0.10	+ 1.0
Mean			+ 0.093	+ 1.23
Div., Flex., etc. .			. .	− 0.18

λ Ursæ Minoris.

	h.	m.	s.
Right Ascension. . .	19	49	17.739
North-Polar Distance .	1°	4′	9″.10

1875.			s.	″
May	26	Sk.	− 3.26a	+ 2.8
July	29	Sk.	+ 2.75δ	. .
Aug.	21	P.	− 0.91a, 51, δ	+ 0.6
	31	F.	. .	+ 0.7
Sept.	7	F.	− 2.26	+ 1.3
	14	P.	− 0.71a	+ 0.4
	20	P.	. .	+ 0.5
	21	F.	. .	+ 1.4
	24	P.	− 1.48	. .
	25	F.	− 0.29	+ 2.0
Oct.	5	Sk.	− 1.76	+ 1.0
	7	F.	− 1.45a	. .
	9	P.	− 5.50	+ 1.3
	9	P.	. .	+ 1.1
	12	F.	+ 1.82a	+ 3.9
	20	P.	+ 0.68	+ 1.3
	21	F.	− 0.59a	+ 0.4
Mean			. .	+ 1.34
Div., Flex., etc. .			. .	− 1.11

λ Ursæ Minoris, S. P.

	h.	m.	s.
Right Ascension. . .	19	49	17.739
North-Polar Distance .	358°	55′	50″.90

λ Ursæ Minoris, S. P.—Continued.

1875.			s.	″
Mar.	10	F.	− 2.23a	+ 1.0
	12	E.	+ 2.44a	+ 1.3
	16	E.	+ 2.49a	. .
	17	F.	+ 0.59a	+ 1.9
Oct.	21	Sk.	− 1.55δ, 51	+ 2.9
Nov.	17	P.	− 1.20	+ 0.5
Dec.	12	P.	+ 0.44δ	+ 1.1
Mean			. .	+ 1.45
Div., Flex., etc. .			. .	− 1.10

α² Capricorni.

	h.	m.	s.
Right Ascension. . .	20	11	7.035
North-Polar Distance .	102°	55′	49″.71

1875.			s.	″
Feb.	25	S.	+ 0.21	− 1.6
Sept.	20	P.	+ 0.01	+ 1.6
	24	P.	+ 0.11	− 0.1
	29	F.	+ 0.10	+ 0.5
Oct.	7	F.	+ 0.10	+ 0.7
	20	P.	+ 0.08	+ 1.5
Mean			+ 0.102	+ 0.43
Div., Flex., etc. .			. .	− 0.02

κ Cephei.

	h.	m.	s.
Right Ascension. . .	20	13	3.633
North-Polar Distance .	12°	39′	58″.85

1875.			s.	″
Sept.	20	P.	+ 0.02	0.0
	24	P.	− 0.15	− 0.4
Mean			− 0.065	− 0.20
Div., Flex., etc. .			. .	− 1.20

π Capricorni.

	h.	m.	s.
Right Ascension. . .	20	20	9.864
North-Polar Distance .	108°	37′	10″.43

1875.			s.	″
Oct.	7	F.	− 0.02	+ 0.3
	12	F.	− 0.05	+ 0.4
	20	P.	+ 0.09	+ 0.4
Mean			+ 0.007	+ 0.37
Div., Flex., etc. .			. .	− 0.08

ε Delphini.

	h.	m.	s.
Right Ascension. . .	20	27	14.421
North-Polar Distance .	79°	7′	12″.40

1875.			s.	″
Sept.	24	P.	+ 0.07	+ 1.1
	29	F.	. .	+ 1.4
Oct.	5	Sk.	+ 0.01	+ 1.9
	7	F.	. .	+ 0.8
	9	P.	. .	+ 0.6
	12	F.	. .	+ 2.1
	13	Sk.	. .	− 0.1
	20	P.	. .	+ 3.0
Mean			+ 0.040	+ 1.35
Div., Flex., etc. .			. .	− 0.39

ε Delphini (Ref.).

1875.			s.	″
Oct.	9	P.	. .	. .
	12	F.	. .	− 1.3
	13	Sk.	. .	− 0.9
	20	P.	. .	+ 0.4
Mean			. .	− 0.60
Div., Flex., etc. .			. .	+ 0.75

Groombridge 3241.

	h.	m.	s.
Right Ascension. . .	20	30	31.889
North-Polar Distance .	17°	53′	30″.68

1875.			s.	″
Sept.	20	P.	+ 0.20	+ 1.5
	24	P.	+ 0.06	+ 1.8
	29	F.	+ 0.20	+ 2.7
Mean			+ 0.153	+ 2.00
Div., Flex., etc. .			. .	− 1.28

Groombridge 3241, S. P.

	h.	m.	s.
Right Ascension. . .	20	30	31.889
North-Polar Distance .	342°	6′	29″.32

1875.			s.	″
Dec.	20	P.	+ 0.06	− 1.0
Div., Flex., etc. .			. .	− 1.27

α Cygni.

	h.	m.	s.
Right Ascension. . .	20	37	10.236
North-Polar Distance .	45°	9′	55″.82

1875.			s.	″
Jan.	11	E.	− 0.04	+ 2.0
	15	E.	+ 0.11	− 0.7
Feb.	14	Sk.	+ 0.29	+ 1.8
	15	E.	+ 0.11	+ 1.5
	25	S.	− 0.04	− 1.2
	26	Sk.	. .	+ 1.7
Mar.	7	E.	+ 0.06	+ 2.2
	10	Sk.	− 0.06	+ 0.5
	11	E.	− 0.09	− 0.1
May	26	Sk.	+ 0.04	+ 2.3
July	29	Sk.	+ 0.04	+ 0.7
Aug.	25	P.	− 0.05	+ 1.0
Sept.	3	F.	− 0.10	+ 1.0
	24	P.	+ 0.07	+ 0.2
	29	F.	+ 0.01	+ 1.0
Oct.	5	Sk.	+ 0.04	+ 0.8
	12	F.	− 0.04	+ 1.6
Nov.	12	P.	+ 0.12	+ 2.3
Mean			+ 0.014	+ 1.03
Div., Flex., etc. .			. .	− 0.87

μ Aquarii.

	h.	m.	s.
Right Ascension. . .	20	45	54.576
North-Polar Distance .	99°	27′	2″.08

1875.			s.	″
Sept.	29	F.	+ 0.06	+ 1.2
Div., Flex., etc. .			. .	− 0.12

μ Aquarii (Ref.).

1875.			s.	″
Oct.	7	F.	. .	− 1.4
Div., Flex., etc. .			. .	+ 0.71

ν CYGNI.

	h.	m.	s.
Right Ascension. . .	20	52	30.782
North-Polar Distance .	49°	18′	46″.17

1875.			s.	″
Aug.	9	P.	0.00	+ 2.1
Sept.	14	P.	+ 0.05	+ 1.9
	24	P.	+ 0.07	+ 1.8
Oct.	12	F.	− 0.03	+ 3.3
	20	P.	+ 0.07	+ 3.9
Nov.	12	P.	+ 0.01	+ 3.3
Mean			+ 0.028	+ 2.71
Div., Flex., etc. .			. .	− 0.50

12-YEAR CAT. 1879.

	h.	m.	s.
Right Ascension. . .	20	53	11.561
North-Polar Distance .	9°	55′	4″.48

1875.			s.	″
July	29	Sk.	+ 0.19	+ 2.0
Sept.	20	P.	− 0.09	0.0
Nov.	12	P.	− 0.34	+ 0.7
Mean			− 0.080	+ 0.90
Div., Flex., etc. .			. .	− 1.28

61^1 CYGNI.

	h.	m.	s.
Right Ascension. . .	21	1	17.733
North-Polar Distance .	51°	51′	50″.74

1875.			s.	″
Sept.	14	P.	0.00	+ 0.8
Oct.	12	F.	+ 0.02	+ 2.9
Nov.	2	P.	− 0.12	+ 2.3
	5	P.	− 0.08	+ 2.1
	13	F.	− 0.12	+ 1.7
Mean			− 0.060	+ 1.96
Div., Flex., etc. .			. .	− 0.28

ζ CYGNI.

	h.	m.	s.
Right Ascension. . .	21	7	36.978
North-Polar Distance .	60°	17′	5″.01

1875.			s.	″
Jan.	11	E.	+ 0.02	+ 1.0
	14	Sk.	+ 0.08	+ 0.4
	15	E.	+ 0.05	+ 0.5
Feb.	12	F.	+ 0.13	+ 0.1
	25	S.	+ 0.02	− 1.0
Mar.	7	E.	+ 0.05	+ 1.8
	10	Sk.	− 0.01	+ 1.4
	11	E.	− 0.02	+ 0.2
May	26	Sk.	+ 0.04	+ 0.4
July	29	Sk.	0.00	+ 2.7
Aug.	25	P.	− 0.01	+ 1.4
Sept.	3	F.	− 0.05	+ 1.2
	11	F.	− 0.03	. .
	24	P.	− 0.07	+ 0.8
Oct.	8	Sk.	− 0.08	. .
	12	F.	+ 0.06	+ 0.7
Nov.	6	Sk.	− 0.11	+ 1.5
	12	P.	0.00	+ 3.3
Dec.	13	E.	+ 0.07	+ 2.2
Mean			+ 0.007	+ 1.09
Div., Flex., etc. .			. .	− 0.10

α CEPHEI.

	h.	m.	s.
Right Ascension. . .	21	15	35.703
North-Polar Distance .	27°	56′	38″.45

1875.			s.	″
Jan.	11	E.	− 0.09	− 1.7
Feb.	12	F.	+ 0.16	+ 2.7
	21	S.	+ 0.18	+ 1.0
	25	S.	− 0.17	− 2.1
Mar.	9	F.	+ 0.08	+ 2.8
	11	E.	− 0.17	− 1.3
Aug.	25	P.	− 0.10	− 0.3
	26	Sk.	. .	− 0.5
Sept.	24	P.	− 0.04	− 1.3
	25	F.	− 0.03	+ 1.0
Oct.	20	P.	0.00	− 0.1
Dec.	13	E.	+ 0.01	+ 0.8
Mean			− 0.015	+ 0.08
Div., Flex., etc. .			. .	− 1.04

α CEPHEI (Ref.).

1875.			s.	″
Aug.	26	Sk.	. .	− 3.9
Oct.	12	F.	. .	− 2.2
	20	P.	. .	− 3.1
Nov.	13	F.	. .	− 0.5
Mean			. .	− 2.42
Div., Flex., etc. .			. .	+ 1.79

1 PEGASI.

	h.	m.	s.
Right Ascension. . .	21	16	18.409
North-Polar Distance .	70°	43′	44″.01

1875.			s.	″
Sept.	20	P.	− 0.11	+ 2.3
Nov.	2	P.	− 0.01	+ 2.5
	5	P.	+ 0.01	+ 2.1
Mean			− 0.037	+ 2.30
Div., Flex., etc. .			. .	− 0.32

β AQUARII.

	h.	m.	s.
Right Ascension. . .	21	24	58.654
North-Polar Distance .	96°	7′	10″.69

1875.			s.	″
Mar.	7	E.	+ 0.14	. .
Aug.	21	P.	+ 0.05	+ 2.2
	25	P.	− 0.07	+ 2.7
Sept.	1	P.	− 0.09	+ 0.5
	3	F.	− 0.02	+ 2.1
	20	P.	− 0.02	+ 1.6
	24	P.	+ 0.01	+ 1.0
	25	F.	+ 0.06	+ 1.4
Oct.	5	Sk.	+ 0.10	+ 3.3
	8	Sk.	− 0.07	. .
	12	F.	+ 0.07	+ 2.7
	27	F.	+ 0.03	+ 1.4
Nov.	5	P.	+ 0.05	+ 1.9
	6	Sk.	+ 0.05	+ 2.2
	12	P.	+ 0.09	+ 3.7
Dec.	13	E.	+ 0.08	+ 5.1
Mean			+ 0.029	+ 2.27
Div., Flex., etc. .			. .	+ 0.06

β CEPHEI.

	h.	m.	s.
Right Ascension. . .	21	27	2.358
North-Polar Distance .	19°	59′	17″.37

β CEPHEI—Continued.

1875.			s.	″
Jan.	14	Sk.	+ 0.08	− 1.7
	20	F.	+ 0.01	+ 0.3
Feb.	25	S.	− 0.32	0.0
Sept.	24	P.	− 0.27	− 1.5
Oct.	7	F.	. .	− 2.1
Nov.	5	P.	+ 0.26	− 1.5
	12	P.	− 0.08	+ 0.4
Mean			− 0.053	− 0.87
Div., Flex., etc. .			. .	− 1.28

β CEPHEI (Ref.).

1875.			s.	″
Oct.	7	F.	. .	− 1.9
Div., Flex., etc. .			. .	+ 1.81

ξ AQUARII.

	h.	m.	s.
Right Ascension. . .	21	31	5.758
North-Polar Distance .	98°	24′	48″.47

1875.			s.	″
Sept.	14	P.	+ 0.09	+ 0.8
Nov.	5	P.	+ 0.08	+ 0.9
Mean			+ 0.085	+ 0.85
Div., Flex., etc. .			.	− 0.08

ε PEGASI.

	h.	m.	s.
Right Ascension. . .	21	38	2.819
North-Polar Distance .	80°	41′	48″.97

1875.			s.	″
Jan.	11	E.	+ 0.01	+ 1.2
	14	Sk.	− 0.09	+ 1.0
	15	E.	+ 0.07	− 0.3
	20	F.	+ 0.06	+ 0.6
Feb.	25	S.	+ 0.05	− 0.4
Mar.	9	F.	+ 0.07	+ 4.6
	10	Sk.	0.00	+ 1.0
	11	E.	− 0.01	+ 0.6
	22	Sk.	− 0.05	+ 1.1
May	26	Sk.	− 0.05	+ 0.7
Aug.	21	P.	− 0.02	+ 2.0
Oct.	5	Sk.	− 0.01	+ 1.1
	8	Sk.	0.00	. .
	20	P.	− 0.01	+ 2.1
	27	F.	− 0.05	+ 2.3
Nov.	2	P.	− 0.03	+ 2.1
	5	P.	− 0.01	+ 2.2
	12	P.	+ 0.02	+ 3.2
	13	F.	− 0.02	+ 2.0
Mean			− 0.004	+ 1.51
Div., Flex., etc. .			. .	− 0.39

11 CEPHEI.

	h.	m.	s.
Right Ascension. . .	21	40	5.081
North-Polar Distance .	19°	15′	50″.96

1875.			s.	″
Sept.	14	P.	− 0.30	− 0.8
	27	F.	− 0.28	0.0
Oct.	13	Sk.	− 0.36	− 0.3
Nov.	13	F.	− 0.19	+ 0.1
Mean			− 0.282	− 0.25
Div., Flex., etc. .			. .	− 1.29

μ Capricorni.

	h.	m.	s.
Right Ascension . . .	21	46	28.773
	°	′	″
North-Polar Distance .	104	8	19.13

1875.			s.	″
Oct.	7	F.	+ 0.12	− 2.7
	27	F.	+ 0.01	+ 2.2
Nov.	2	P.	+ 0.09	+ 1.7
	5	P.	+ 0.01	+ 1.7
	13	F.	+ 0.11	+ 1.6
Mean			+ 0.068	+ 0.90
Div., Flex., etc. .			. .	− 0.01

79 Draconis.

	h.	m.	s.
Right Ascension . . .	21	51	18.650
	°	′	″
North-Polar Distance .	16	53	20.78

1875.			s.	″
Aug.	9	P.	+ 0.08	0.0
Oct.	7	F.	+ 0.21	+ 1.3
	27	F.	− 0.06	+ 0.7
Nov.	2	P.	− 0.31	+ 0.4
	5	P.	+ 0.21	+ 0.7
	6	Sk.	+ 0.02	+ 0.3
	8	F.	+ 0.01	+ 0.4
	12	P.	. .	+ 2.6
Mean			+ 0.023	+ 0.80
Div., Flex., etc. .			. .	− 1.27

79 Draconis (Ref.).

1875.			s.	″
Sept.	27	F.	. .	+ 0.8
Nov.	12	P.	. .	− 4.3
Mean			. .	− 1.75
Div., Flex., etc. .			. .	+ 1.60

79 Draconis, S. P.

	h.	m.	s.
Right Ascension . . .	21	51	18.650
	°	′	″
North-Polar Distance .	343	6	39.22

1875.			s.	″
April	5	E.	+ 0.66	+ 2.4
Dec.	22	F.	− 0.52	+ 0.6
Mean			+ 0.070	+ 1.50
Div., Flex., etc. .			. .	− 1.31

α Aquarii.

	h.	m.	s.
Right Ascension . . .	21	59	21.780
	°	′	″
North-Polar Distance .	90	55	33.99

1875.			s.	″
Jan.	11	E.	+ 0.06	+ 2.5
	14	Sk.	0.00	− 0.6
	20	F.	+ 0.03	+ 1.3
Feb.	1	F.	+ 0.13	+ 1.1
Mar.	10	Sk.	+ 0.08	. .
	22	Sk.	+ 0.11	+ 0.9
Aug.	21	P.	+ 0.05	+ 0.9
	26	Sk.	. .	+ 0.6
	27	F.	+ 0.02	0.0
Nov.	2	P.	+ 0.08	+ 1.2
	5	P.	+ 0.15	+ 0.4
	6	Sk.	+ 0.12	+ 1.9
	8	F.	. .	+ 0.3
	12	P.	. .	+ 2.6
	13	F.	+ 0.10	+ 0.6
Mean			+ 0.078	+ 0.98
Div., Flex., etc. .			. .	− 0.02

α Aquarii (Ref.).

1875.			s.	″
Aug.	26	Sk.	. .	+ 1.0
Oct.	5	Sk.	. .	+ 0.6
Nov.	12	P.	. .	− 0.6
Mean			. .	+ 0.33
Div., Flex., etc. .			. .	+ 0.85

θ Aquarii.

	h.	m.	s.
Right Ascension . . .	22	10	14.191
	°	′	″
North-Polar Distance .	98	24	17.06

1875.			s.	″
Oct	12	F.	+ 0.08	+ 1.2
Nov.	5	P.	+ 0.11	+ 1.6
	11	E.	. .	+ 1.9
	12	P.	. .	+ 2.4
Mean			+ 0.095	+ 1.78
Div., Flex., etc. .			. .	− 0.08

θ Aquarii (Ref.).

1875.			s.	″
Nov.	11	E.	. .	− 4.0
	12	P.	. .	+ 1.1
Mean			. .	− 1.45
Div., Flex., etc. .			. .	+ 0.66

π Aquarii.

	h.	m.	s.
Right Ascension . . .	22	18	53.570
	°	′	″
North-Polar Distance .	89	15	21.89

1875.			s.	″
Aug.	9	P.	− 0.03	+ 1.9
Nov.	2	P.	− 0.01	+ 0.6
	6	Sk.	. .	+ 1.0
	8	F.	+ 0.10	+ 0.2
	11	E.	. .	+ 3.4
	12	P.	. .	+ 1.6
	24	F.	+ 0.09	+ 0.1
Mean			+ 0.038	+ 1.26
Div., Flex., etc. .			. .	− 0.02

π Aquarii (Ref.).

1875.			s.	″
Nov.	6	Sk.	. .	− 0 2
	11	E.	. .	+ 0.6
	12	P.	. .	− 0.2
	24	F.	. .	− 0.1
Mean			. .	+ 0.02
Div., Flex., etc. .			. .	+ 0.81

η Aquarii.

	h.	m.	s.
Right Ascension . . .	22	28	55.937
	°	′	″
North-Polar Distance .	90	45	39.52

1875.			s.	″
Oct.	20	P.	+ 0.09	+ 0.8
	29	Sk.	+ 0.13	+ 0.6
Nov.	2	P.	+ 0.12	+ 0.2
	8	F.	. .	+ 1.2
	11	E.	. .	+ 2.5
	12	P.	. .	+ 1.3
	13	F.	. .	+ 0.2
	24	F.	+ 0.16	+ 0.4
	27	F.	+ 0.09	− 0.5
Mean			+ 0.118	+ 0.74
Div., Flex., etc. .			. .	− 0.02

η Aquarii (Ref.).

1875.			s.	″
Nov.	8	F.	. .	0.0
	11	E.	. .	− 0.4
	12	P.	. .	0.0
	13	F.	. .	− 0.4
	24	F.	. .	+ 0.9
	27	F.	. .	− 0.1
Mean			. .	0.00
Div., Flex., etc. .			. .	+ 0.84

226 Cephei.

	h.	m.	s.
Right Ascension . . .	22	30	4.342
	°	′	″
North-Polar Distance .	14	25	4.10

1875.			s.	″
Oct.	27	F.	− 0.30	+ 1.1
Nov.	2	P.	+ 0.02	− 0.1
Mean			− 0.14	+ 0.50
Div., Flex., etc. .			. .	− 1.21

226 Cephei (Ref.).

1875.			s.	″
Sept.	27	F.	. .	− 1.4
Div., Flex., etc. .			. .	+ 1.60

226 Cephei, S. P.

	h.	m.	s.
Right Ascension . . .	22	30	4.343
	°	′	″
North-Polar Distance .	345	34	55.90

1875.			s.	″
April	21	E.	− 0.03	+ 1.8
Div., Flex., etc. .			. .	− 1.32

ζ Pegasi.

	h.	m.	s.
Right Ascension . . .	22	35	13.614
	°	′	″
North-Polar Distance .	79	49	13.04

1875.			s.	″
June	23	F.	+ 0.11	+ 2.1
Aug.	9	P.	− 0.01	+ 1.8
	13	P.	+ 0.02	+ 2.0
	20	P.	− 0.05	+ 2.5
	26	Sk.	+ 0.07	+ 1.5
	30	P.	+ 0.01	+ 2.2
Oct.	13	Sk.	+ 0.18	+ 1.4
	25	Sk.	0.00	+ 1.1
	27	F.	+ 0.03	+ 2.2
	28	P.	. .	+ 1.4
	29	Sk.	+ 0.01	+ 2.5
Nov.	6	Sk.	. .	+ 1.7
	8	F.	. .	+ 2.3
	11	E.	+ 0.10	+ 2.4
	12	P.	. .	+ 2.8
	27	F.	+ 0.07	+ 1.0
Mean			+ 0.045	+ 1.93
Div., Flex., etc. .			. .	− 0.40

ζ Pegasi (Ref.).

1875.			s.	″
Oct.	28	P.	. .	+ 1.5
Nov.	6	Sk.	. .	+ 1.1
	12	P.	. .	+ 1.1
Mean			. .	+ 1.23
Div., Flex., etc. .			. .	+ 0.78

ι CEPHEI.

	h.	m.	s.
Right Ascension . . .	22	45	13.997
North-Polar Distance .	24°	27′	24″.67

1875.			s.	″
Aug.	26	Sk.	− 0.01	+ 1.4
	27	F.	− 0.04	+ 1.0
	29	Sk.	− 0.09	+ 0.2
Nov.	12	P.	. .	+ 1.1
	24	F.	− 0.06	+ 1.5
Mean			− 0.050	+ 1.04
Div., Flex., etc. .			. .	− 1.10

ι CEPHEI (Ref.).

1875.			s.	″
Sept.	27	F.	. .	− 2.3
Nov.	12	P.	. .	− 1.8
	24	F.	. .	− 0.9
Mean			. .	− 1.67
Div., Flex., etc. .			. .	+ 1.78

ι CEPHEI, S.P.

	h.	m.	s.
Right Ascension . . .	22	45	13.997
North-Polar Distance .	335°	32′	35″.33

1875.			s.	″
April	20	Sk.	+ 0.16	+ 2.0
May	11	E.	+ 0.43	+ 2.0
Mean			+ 0.295	+ 2.00
Div., Flex., etc. .			. .	− 1.01

λ AQUARII.

	h.	m.	s.
Right Ascension . . .	22	46	5.477
North-Polar Distance .	98°	14′	38″.11

1875.			s.	″
Aug.	9	P.	+ 0.08	+ 1.2
	31	F.	+ 0.10	+ 2.4
Oct.	25	E.	− 0.03	+ 1.6
	27	F.	+ 0.09	+ 2.2
	28	P.	+ 0.15	+ 1.6
Nov.	5	P.	+ 0.12	+ 2.4
	8	F.	+ 0.14	+ 1.4
	27	F.	+ 0.22	+ 0.8
Mean			+ 0.109	+ 1.70
Div., Flex., etc. .			. .	− 0.07

λ AQUARII (Ref.).

1875.			s.	″
Nov.	8	F.	. .	+ 0.9
	27	F.	. .	+ 2.4
Mean			. .	+ 1.65
Div., Flex., etc. .			. .	+ 0.65

α PISCIS AUSTRALIS.

	h.	m.	s.
Right Ascension . . .	22	50	44.377
North-Polar Distanee .	120°	17′	2″.22

1875.			s.	″
Jan.	11	E.	+ 0.27	+ 3.0
	20	F.	− 0.02	− 0.5
April	4	E.	+ 0.12	+ 0.9
June	23	Sk.	+ 0.10	. .
Aug.	9	P.	+ 0.03	+ 0.9
	13	P.	0.00	+ 0.5
	20	P.	− 0.14	+ 1.6
	26	Sk.	+ 0.02	+ 1.2
	30	P.	+ 0.02	+ 2.3
	31	F.	+ 0.06	+ 1.2
Oct.	12	F.	+ 0.03	+ 0.5
	13	Sk.	+ 0.17	− 1.7
	20	P.	+ 0.03	+ 2.0
	25	Sk.	+ 0.03	+ 0.1
	27	F.	+ 0.05	+ 0.2
	28	P.	+ 0.17	+ 1.1
	29	Sk.	+ 0.17	+ 1.6
Nov.	5	P.	− 0.02	+ 1.5
	8	F.	+ 0.03	+ 2.1
	11	E.	+ 0.11	+ 2.8
	24	F.	+ 0.03	+ 1.8
	27	F.	. .	− 0.4
Mean			+ 0.060	+ 1.08
Div., Flex., etc. .			. .	+ 0.24

α PEGASI.

	h.	m.	s.
Right Ascension . . .	22	58	32.103
North-Polar Distance .	75°	27′	59″.70

1875.			s.	″
Jan.	11	E.	+ 0.10	+ 3.6
	20	F.	+ 0.04	+ 2.1
Feb.	1	F.	+ 0.01	+ 0.7
	13	F.	+ 0.02	+ 2.8
	15	Sk.	+ 0.08	+ 3.7
Mar.	22	Sk.	+ 0.01	+ 3.8
April	13	F.	. .	+ 0.1
May	27	E.	+ 0.03	+ 3.8
June	23	Sk.	+ 0.02	+ 2.8
Aug	9	P.	− 0.03	+ 1.6
	13	P.	− 0.01	+ 1.4
	20	P.	− 0.01	+ 2.3
	26	Sk.	− 0.07	+ 1.6
	30	P.	− 0.15	+ 0.3
	31	F.	− 0.08	+ 2.7
Oct.	12	F.	− 0.01	+ 2.0
	13	Sk.	+ 0.04	+ 1.7
	20	P.	. .	+ 1.9
	25	Sk.	− 0.06	+ 1.1
	27	F.	+ 0.07	+ 2.3
	28	P.	− 0.02	+ 2.3
	29	Sk.	+ 0.02	+ 2.1
Nov.	2	P.	− 0.06	+ 2.0
	5	P.	+ 0.03	+ 2.1
	8	F.	− 0.03	+ 0.8
	11	E.	+ 0.01	+ 3.6
	13	F.	+ 0.12	+ 3.0
	24	F.	0.00	+ 1.5
	27	F.	− 0.01	+ 1.4
Mean			0.000	+ 2.11
Div., Flex., etc. .			. .	− 0.36

α PEGASI (Ref.).

1875.			s.	″
Sept.	27	F.	. .	+ 1.1
Oct.	20	P.	. .	+ 1.3
Mean			. .	+ 1.20
Div., Flex., etc. .			. .	+ 0.68

ο CEPHEI.

	h.	m.	s.
Right Ascension . . .	23	13	30.049
North-Polar Distance .	22°	34′	21″.35

1875.			s.	″
Oct.	12	F.	+ 0.10	− 0.5
	28	P.	− 0.15	− 0.2
	29	Sk.	− 0.22	− 0.5
Nov.	5	P.	+ 0.20	− 0.9
	11	E.	. .	+ 1.4
	12	P.	. .	+ 0.7
	24	F.	− 0.13	+ 0.3
Mean			− 0.040	+ 0.04
Div., Flex., etc. .			. .	− 1.15

ο CEPHEI (Ref.).

1875.			s.	″
Nov.	11	E.	. .	− 4.4
	12	P.	. .	− 5.4
	24	F.	. .	− 3.9
Mean			. .	− 4.57
Div., Flex., etc. .			. .	+ 1.85

θ PISCIUM.

	h.	m.	s.
Right Ascension . . .	23	21	37.621
North-Polar Distance .	84°	18′	25″.33

1875.			s.	″
Feb.	5	F.	+ 0.17	+ 4.5
Aug.	21	P.	+ 0.06	+ 2.3
Sept.	7	F.	+ 0.07	+ 2.3
Oct.	2	E.	+ 0.05	+ 3.2
	25	E.	+ 0.04	+ 1.6
	27	E.	− 0.05	+ 0.8
	28	P.	+ 0.06	+ 2.2
Nov.	2	P.	+ 0.09	+ 1.6
	5	P.	+ 0.03	+ 1.6
	11	E.	+ 0.08	+ 4.2
	24	F.	+ 0.02	+ 1.6
Mean			+ 0.056	+ 2.35
Div., Flex., etc. .			. .	− 0.15

ι PISCIUM.

	h.	m.	s.
Right Ascension . . .	23	33	31.328
North-Polar Distance .	85°	3′	3″.12

1875.			s.	″
Aug.	20	P.	− 0.03	+ 1.8
Sept.	4	P.	+ 0.01	+ 1.0
	8	P.	+ 0.01	+ 0.6
	20	P.	− 0.03	+ 0.6
	24	P.	− 0.03	+ 1.3
Oct.	2	E.	− 0.06	+ 2.7
	12	F.	+ 0.04	+ 2.2
	25	E.	− 0.11	+ 0.4
	27	E.	(− 0.19)	+ 1.0
	28	P.	− 0.05	+ 2.0
Nov.	2	P.	− 0.01	+ 1.2
	5	P.	− 0.05	− 0.2
Mean			− 0.028	+ 1.22
Div., Flex., etc. .			. .	− 0.09

γ CEPHEI.

	h.	m.	s.
Right Ascension . . .	23	34	13.811
North-Polar Distance .	13°	3′	54″.85

1875.			s.	″
June	23	Sk.	+ 0.23	+ 1.0
Aug.	26	Sk.	+ 0.01	+ 1.0
Sept.	14	P.	+ 0.29	+ 0.2
Oct.	12	F.	+ 0.40	+ 2.3
Nov.	8	F.	. .	+ 1.2
	11	E.	− 0.31	+ 1.3
	12	P.	. .	+ 2.0
Mean			+ 0.124	+ 1.29
Div., Flex., etc. .			. .	− 1.20

γ CEPHEI (Ref.).

1875.			s.	″
Nov.	8	F.	. .	− 1.0
	11	E.	. .	− 4.2
	12	P.	. .	− 2.2
Mean			. .	− 2.47
Div., Flex., etc. .			. .	+ 1.59

γ CEPHEI, S. P.

	h.	m.	s.
Right Ascension. . . .	23	34	13.811
	°	′	″
North-Polar Distance .	346	56	5.15

1875.			s.	″
April	20	Sk.	+ 0.52	+ 0.8
May	11	E.	+ 0.86	+ 1.3
	27	E.	+ 0.32	+ 1.3
Sept.	24	F.	− 0.69	+ 1.5
Mean			+ 0.252	+ 1.22
Div., Flex., etc. .			. .	− 1.30

GROOMBRIDGE 4163.

	h.	m.	s.
Right Ascension. . . .	23	48	46.327
	°	′	″
North-Polar Distance .	16	17	7.72

1875.			s.	″
Sept.	4	P.	+ 0.01	+ 1.7
	8	P.	− 0.06	− 0.1
Oct.	29	Sk.	− 0.38	+ 0.7
Nov.	2	P.	− 0.14	+ 0.3
	5	P.	+ 0.23	+ 0.8
	11	E.	. .	+ 1.8
	17	P.	− 0.38	+ 0.2
	24	F.	− 0.09	+ 1.5
Mean			− 0.116	+ 0.86
Div., Flex., etc. .			. .	− 1.25

GROOMBRIDGE 4163 (Ref.).

1875.			s.	″
Nov.	11	E.	. .	− 2.9
	24	F.	. .	− 3.4
Mean			. .	− 3.15
Div., Flex., etc. .			. .	+ 1.61

GROOMBRIDGE 4163, S. P.

	h.	m.	s.
Right Ascension. . . .	23	48	46.327
	°	′	″
North-Polar Distance .	343	42	52.28

1875.			s.	″
April	20	Sk.	− 0.02	+ 2.3
May	12	F.	. .	+ 1.3
	27	E.	+ 0.24	+ 1.5
Mean			+ 0.11	+ 1.70
Div., Flex., etc. .			. .	− 1.33

ω PISCIUM.

	h.	m.	s.
Right Ascension. . . .	23	52	53.596
	°	′	″
North-Polar Distance .	83	49	42.66

1875.			s.	″
Feb.	5	F.	+ 0.02	+ 2.2
June	25	F.	+ 0.01	+ 0.6
Sept.	7	F.	− 0.04	+ 1.1
Oct.	12	F.	+ 0.01	+ 0.4
	20	P.	− 0.04	+ 1.8
	25	E.	− 0.02	+ 1.5
	27	E.	− 0.05	− 2.3
	28	P.	+ 0.02	+ 2.2
Nov.	2	P.	− 0.03	+ 1.5
	5	E.	− 0.03	+ 1.9
	8	F.	+ 0.04	+ 0.3
	17	P.	− 0.08	+ 1.8
	22	Sk.	. .	+ 1.5
	27	F.	− 0.03	+ 1.4
Dec.	18	F.	− 0.03	+ 3.1
	20	P.	− 0.02	+ 2.8
Mean			− 0.018	+ 1.36
Div., Flex., etc. .			. .	− 0.18

ω PISCIUM (Ref.).

1875.			s.	″
Nov.	22	Sk.	. .	+ 1.6
Div., Flex., etc. .			. .	+ 0.89

MEAN PLACES

OF

MISCELLANEOUS STARS

GIVEN BY

INDIVIDUAL OBSERVATIONS

WITH THE

TRANSIT CIRCLE.

1875.

MEAN PLACES OF MISCELLANEOUS STARS FOR 1875.0

GIVEN BY

INDIVIDUAL OBSERVATIONS

WITH THE

TRANSIT CIRCLE.

B. A. C. 8375.

1875.			h.	m.	s.	°	′	″
Nov.	22	Sk.	0	0	31.34	129	34	25.8
	24	F.			31.47			27.8
	27	F.			31.51			26.4
Mean . . .			0	0	31.440	129	34	26.67
Div., Flex., etc.					. .			+ 0.35

B. A. C. 8376.

1875.			h.	m.	s.	°	′	″
Dec.	10(8.8)	Sk.	0	1	1.91	131	10	30.3
	18	F.			1.88			32.3
	20	P.			2.05			34.8
Mean . . .			0	1	1.947	131	10	32.47
Div., Flex., etc.					. .			+ 0.37

4 CETI.

1875.			h.	m.	s.	°	′	″
Nov.	11	E.	0	1	20.05	93	14	45.5
	12	P.			19.97			41.8
	17	P.			19.89			40.4
Mean . . .			0	1	19.970	93	14	42.57
Div., Flex., etc.					. .			+ 0.06

B. A. C. 2.

1875.			h.	m.	s.	°	′	″
Dec.	2	F.	0	1	42.20	124	13	32.2
	18	F.			42.11			33.6
	20	P.			42.20			35.1
Mean . . .			0	1	42.170	124	13	33.63
Div., Flex., etc.					. .			+ 0.22

5 CETI.

1875.			h.	m.	s.	°	′	″
Nov.	11	E.	0	1	48.13	93	8	42.3
	12	P.			48.12			38.0
	17	P.			48.02			37.5
Mean . . .			0	1	48.090	93	8	39.27
Div., Flex., etc.					. .			+ 0.06

B. A. C. 5.

1875.			h.	m.	s.	°	′	″
Nov.	10	Sk.	0	2	18.87	92	55	. .
	22	Sk.			18.74			5.5
	27	F.			18.86			6.0
Dec.	20	P.			. .			9.2
Mean . . .			0	2	18.823	92	55	6.90
Div., Flex., etc.					. .			+ 0.05

B. A. C. 22.

1875.			h.	m.	s.	°	′	″
Nov	5	P.	0	4	58.34	131	4	8.2
	12	P.			58.75			9.3
	17	P.			58.48			5.0
Mean . . .			0	4	58.523	131	4	7.50
Div., Flex., etc.					. .			+ 0.37

B. A. C. 24.

1875.			h.	m.	s.	°	′	″
Nov.	24	F.	0	5	. .	125	49	57.8
	27	F.			22.52			59.7
Dec.	10(7.0)	Sk.			22.60		49	59.0
	18	F.			22.51		50	0.5
Mean . . .			0	5	22.543	125	49	59.25
Div., Flex., etc.					. .			+ 0.23

LAMONT 18.

1875.			h.	m.	s.	°	′	″
Sept.	24	P.	0	6	15.84	91	55	22.3
Oct.	29	Sk.			15.78			21.1
Nov.	8(8.0)	F.			15.83			21.1
Mean . . .			0	6	15.817	91	55	21.50
Div., Flex., etc.					. .			− 0.01

B. A. C. 38.

1875.			h.	m.	s.	°	′	″
Oct.	9	P.	0	8	58.08	130	47	27.2
Nov.	5	P.			57.84			26.7
	11	E.			58.05			31.4
Mean . . .			0	8	57.990	130	47	28.43
Div., Flex., etc.					. .			+ 0.37

B. A. C. 69.

1875.			h.	m.	s.	°	′	″
Aug.	20	P.	0	14	40.62	129	55	58.1
Oct.	9	P.			40.79			57.1
	13(8.2)	Sk.			41.01			57.1
Mean . . .			0	14	40.807	129	55	57.37
Div., Flex., etc.					. .			+ 0.36

LALANDE 512.

1875.			h.	m.	s.	°	′	″
Sept.	27(6.0)	F.	0	18	59.79	88	45	10.2
Oct.	5	Sk.			59.74			11.3
	9	P.			59.74			8.3
Mean . . .			0	18	59.757	88	45	9.93
Div., Flex., etc.					. .			− 0.02

B. A. C. 104.

1875.			h.	m.	s.	°	′	″
Aug.	20	P.	0	22	16.39	130	36	21.9
Sept.	7	F.			16.40			19.4
	8	P.			16.38			22.5
	27	F.			. .			20.1
Mean . . .			0	22	16.390	130	36	20.98
Div., Flex., etc.					. .			+ 0.37

B. A. C. 118.

1875.			h.	m.	s.	°	′	″
Aug.	20	P.	0	24	21.15	130	12	28.4
Sept.	7	F.			21.08			23.6
Oct.	5	Sk.			21.19			27.0
Mean . . .			0	24	21.140	130	12	26.33
Div., Flex., etc.					. .			+ 0.36

B. A. C. 136.

1875.			h.	m.	s.	°	′	″
Sept.	8	P.	0	27	36.12	125	40	27.3
Oct.	7	F.			36.04			23.8
	9	P.			36.09			. .
	13	Sk.			36.27			25.9
Mean . . .			0	27	36.130	125	40	25.67
Div., Flex., etc.					. .			+ 0.23

B. A. C. 144.

1875.			h.	m.	s.	°	′	″
Sept.	3	F.	0	28	33.71	128	41	6.9
	4	P.			33.85			8.0
	7	F.			33.50			6.7
Mean . . .			0	28	33.687	128	41	7.20
Div., Flex., etc.					. .			+ 0.32

B. A. C. 166.

1875.			h.	m.	s.	°	′	″
Feb.	22	S.	0	32	38.84	59	49	27.2
April	28	E.			38.86			24.1
May	10	E.			38.77			. .
June	25	F.			38.80			23.3
Sept.	4	P.			38.83			25.4
	7	F.			38.74			24.8
	8	P.			38.90			23.7
	14	P.			38.80			24.5
Nov.	2	P.			38.76			25.2
	17	P.			38.76			24.9
Mean . . .			0	32	38.806	59	49	24.79
Div., Flex., etc.					. .			− 0.11

B. A. C. 192.

1875.			h.	m.	s.	°	′	″
Aug.	20	P.	0	36	41.81	129	8	55.9
Sept.	14	P.			41.86			54.9
	27 (6.0)	F.			42.00			58.2
Mean . . .			0	36	41.890	129	8	56.33
Div., Flex., etc.					. .		+	0.33

B. A. C. 202.

1875.			h.	m.	s.	°	′	″
Aug.	20	P.	0	38	9.14	129	6	38.9
Sept.	14	P.			9.24			37.1
	27 (6.0)	F.			9.50			39.4
Mean . . .			0	38	9.293	129	6	38.47
Div., Flex., etc.					. .		+	0.33

WEISSE 753.

1875.			h.	m.	s.	°	′	″
Oct.	27	F.	0	44	36.52	87	12	33.8
	28	P.			36.33			34.2
	29	Sk.			36.36			32.9
Mean . . .			0	44	36.403	87	12	33.63
Div., Flex., etc.					. .		—	0.06

B. A. C. 237.

1875.			h.	m.	s.	°	′	″
Oct.	28 (6.5)	P.	0	44	52.24	87	17	37.6
Div., Flex., etc.					. .		—	0.06

B. A. C. 259.

1875.			h.	m.	s.	°	′	″
May	10	E.	0	49	49.14	52	10	. .
June	25	F.			49.12			44.2
Sept.	4	P.			49.30			45.9
	7	F.			49.09			44.7
	8	P.			49.28			45.1
Nov.	11	E.			49.15			45.3
Dec.	20	P.			49.29			45.9
Mean . . .			0	49	49.196	52	10	45.18
Div., Flex., etc.					. .		—	0.25

SCHJELLERUP 337.

1875.			h.	m.	s.	°	′	″
Sept.	27	F.	0	51	51.77	86	22	42.9
Oct.	9	P.			51.74			45.3
	27	F.			51.94			46.2
Mean . . .			0	51	51.817	86	22	44.80
Div., Flex., etc.					. .		—	0.07

DURCH. 3°, 133.

1875.			h.	m.	s.	°	′	″
Sept.	27	F.	0	52	15.31	86	28	12.2
Oct.	9	P.			15.22			11.8
	27	F.			15.33			11.0
Mean . . .			0	52	15.287	86	28	11.67
Div., Flex., etc.					. .		—	0.07

B. A. C. 272.

1875.			h.	m.	s.	°	′	″
Sept.	4	P.	0	52	34.95	120	2	0.7
	7	F.			35.08		1	58.9
	8	P.			34.94		1	59.3
Mean . . .			0	52	34.990	120	1	59.63
Div., Flex., etc.					. .		+	0.24

LALANDE 1799.

1875.			h.	m.	s.	°	′	″
Aug.	20	P.	0	55	54.23	85	37	. .
Oct.	27	F.			54.35			9.7
	28	P.			54.31			11.9
Mean . . .			0	55	54.297	85	37	10.80
Div., Flex., etc.					. .		—	0.08

B. A. C. 289.

1875.			h.	m.	s.	°	′	″
Sept.	4	P.	0	56	28.23	122	13	31.8
	8	P.			28.19			31.1
Oct.	7	F.			28.32			29.5
Mean . . .			0	56	28.247	122	13	30.80
Div., Flex., etc.					. .		+	0.25

WEISSE 982.

1875.			h.	m.	s.	°	′	″
Aug.	20	P.	0	57	13.06	85	26	10.6
Oct.	5	Sk.			13.11			9.4
	9	P.			13.00			8.5
	28	P.			13.07			11.1
Mean . . .			0	57	13.060	85	26	9.90
Div., Flex., etc.					. .		—	0.08

B. A. C. 303.

1875.			h.	m.	s.	°	′	″
Sept.	14	P.	0	58	24.21	85	0	51.7
	27 (6.5)	F.			24.16			50.5
Oct.	5	Sk.			24.13			51.9
	27	F.			24.18			51.0
Nov.	2	P.			24.15			51.9
Mean . . .			0	58	24.166	85	0	51.40
Div., Flex., etc.					. .		—	0.09

B. A. C. 326.

1875.			h.	m.	s.	°	′	″
Jan.	14	Sk.	1	1	46.79	123	28	56.0
Nov.	8	F.			46.81			52.5
	11	E.			46.71			55.0
Mean . . .			1	1	46.770	123	28	54.50
Div., Flex., etc.					. .		+	0.23

B. A. C. 332.

1875.			h.	m.	s.	°	′	″
Sept.	4	P.	1	2	18.22	100	50	45.1
	8	P.			18.21			43.7
ov.	12	P.			18.21			45.0
	17	P.			18.09			44.0
Mean . . .			1	2	18.182	100	50	44.45
Div., Flex., etc.					. .		—	0.08

B. A. C. 334.

1875.			h.	m.	s.	°	′	″
Feb.	22	S.	1	2	44.29	55	2	36.8
Mar.	4	E.			44.19			35.8
	8	E.			44.14			36.8
	10	F.			44.27			34.0
	12	E.			44.23			34.1
	16	E.			44.29			34.2
April	20	E.			44.40			33.3
May	6	E.			44.27			33.5
	10	E.			44.26			. .
	14	E.			44.22			34.8
	18	E.			44.22			32.7
	28	F.			44.15			35.7
June	25	F.			44.21			34.3
Sept.	14	P.			44.26			32.4
Oct.	9	P.			44.16			33.5
Nov.	2	P.			44.26			35.9
	22	Sk.			44.13			33.8
Dec.	17	E.			44.14			34.9
	20	P.			44.33			34.0
Mean . . .			1	2	44.233	55	2	34.47
Div., Flex., etc.					. .		+	0.06

B. A. C. 355.

1875.			h.	m.	s.	°	′	″
Sept.	4	P.	1	5	16.45	122	54	49.8
	8	P.			16.48			49.4
	24	P.			16.39			47.7
Mean . . .			1	5	16.440	122	54	48.97
Div., Flex., etc.					. .		+	0.23

B. A. C. 362.

1875.			h.	m.	s.	°	′	″
Oct.	28	P.	1	6	28.86	121	27	52.2
Nov.	2	P.			28.84			52.5
	8	F.			28.88			51.5
Mean . . .			1	6	28.860	121	27	52.07
Div., Flex., etc.					. .		+	0.25

B. A. C. 366.

1875.			h.	m.	s.	°	′	″
Nov.	8	F.	1	6	58.31	125	82	8.5
	12	P.			58.31			12.3
	17	P.			58.19			9.3
Mean . . .			1	6	58.270	125	82	10.03
Div., Flex., etc.					. .		+	0.24

B. A. C. 411.

1875.			h.	m.	s.	°	′	″
Nov.	24	F.	1	16	. .	127	42	22.7
	27	F.			28.25			20.5
	30	Sk.			28.06			21.0
Mean . . .			1	16	28.155	127	42	21.40
Div., Flex., etc.					. . .		+	0.30

B. A. C. 415.

1875.			h.	m.	s.	°	′	″
Dec.	20	P.	1	17	1.22	127	15	2.7
	22	F.			1.57		15	1.6
	27	Sk.			1.17		14	58.8
Mean . . .			1	17	1.320	127	15	1.13
Div., Flex., etc.					. .		+	0.30

B. A. C. 421.

1875.			h.	m.	s.	°	′	″
Dec.	22	F.	1	17	42.28	121	35	51.1
	23	Sk.			41.79			52.8
	27	Sk.			41.93			51.7
Mean . . .			1	17	42.000	121	35	51.87
Div., Flex., etc.					. .		+	0.25

B. A. C. 424.

1875.			h.	m.	s.	°	′	″
Nov.	12	P.	1	18	23.10	122	27	44.7
	17	P.			22.96			44.0
	27	F.			. .			41.4
Dec.	2	F.			23.01			43.8
Mean . . .			1	18	23.023	122	27	43.48
Div., Flex., etc.					. .		+	0.24

B. A. C. 445.

1875.			h.	m.	s.	°	′	″
Sept.	4	P.	1	22	55.12	120	32	27.1
	24	P.			55.02			24.5
Nov.	12	P.			55.15			26.7
Mean . . .			1	22	55.097	120	32	26.10
Div., Flex., etc.					. .		+	0.25

B. A. C. 458.

1875.			h. m. s.	° ′ ″
Aug.	13	P.	1 25 41.87	120 37 50.2
Sept.	4	P.	41.85	47.1
	8	P.	41.83	50.0
Mean . . .			1 25 41.850	120 37 49.10
Div., Flex., etc.			. .	+ 0.25

B. A. C. 466.

1875.			h. m. s.	° ′ ″
Sept.	8	P.	1 27 20.40	127 30 28.3
	24	P.	20.47	27.3
Oct.	28	P.	20.39	29.5
Mean . . .			1 27 20.420	127 30 28.37
Div., Flex., etc.			. .	+ 0.30

B. A. C. 489¹.

1875.			h. m. s.	° ′ ″
Jan.	15	E.	1 30 21.87	120 32 54.3
Aug.	13	P.	21.78	54.7
Sept.	4	P.	21.89	53.9
Mean . . .			1 30 21.847	120 32 54.30
Div., Flex., etc.			. .	+ 0.25

B. A. C. 526.

1875.			h. m. s.	° ′ ″
Aug.	13	P.	1 35 58.09	128 46 4.1
Sept.	4	P.	58.12	6.5
	24	P.	58.03	1.8
Mean . . .			1 35 58.080	128 46 4.13
Div., Flex., etc.			. .	+ 0.33

B. A. C. 528.

1875.			h. m. s.	° ′ ″
Jan.	15	E.	1 36 32.33	127 27 50.6
Sept.	8	P.	32.33	48.8
Oct.	4	P.	32.38	49.5
	25	Sk.	32.26	50.0
Mean . . .			1 36 32.325	127 27 49.72
Div., Flex., etc.			. .	+ 0.30

B. A. C. 536.

1875.			h. m. s.	° ′ ″
Sept.	4	P.	1 38 15.79	106 35 48.7
	8	P.	15.76	47.4
Oct.	25	Sk.	15.63	47.5
Mean . . .			1 38 15.727	106 35 47.87
Div., Flex., etc.			. .	− 0.06

B. A. C. 553.

1875.			h. m. s.	° ′ ″
Aug.	13	P.	1 42 20.31	127 47 3.5
Sept.	8	P.	20.32	3.5
	24	P.	20.18	4.8
Oct.	25	Sk.	20.23	2.9
Mean . . .			1 42 20.260	127 47 3.68
Div., Flex., etc.			. .	+ 0.31

WEISSE 767.

1875.			h. m. s.	° ′ ″
Nov.	2	P.	1 44 14.15	79 34 36.1
	5	P.	14.10	35.9
	10	Sk.	14.13	37.0
Mean . . .			1 44 14.127	79 34 36.33
Div., Flex., etc.			. .	− 0.40

WEISSE 791¹.

1875.			h. m. s.	° ′ ″
Sept.	24	P.	1 45 24.31	79 48 30.6
Oct.	28	P	24.23	31.7
Mean . . .			1 45 24.270	79 48 31.15
Div., Flex., etc.			. .	− 0.40

WEISSE 791².

1875.			h. m. s.	° ′ ″
Sept.	24	P.	1 45 . .	79 48 27.4
Oct.	27	F.	24.28	28.1
	28	P.	24.34	27.8
Mean . . .			1 45 24.310	79 48 27.77
Div., Flex. etc.			. .	− 0.40

B. A. C. 569.

1875.			h. m. s.	° ′ ″
July	23 (3.5)	F.	1 45 57.57	61 1 52.5
Sept.	27	F.	57.61	52.4
Nov.	17	P.	57.52	52.2
	24	F.	57.60	51.2
Dec.	17	E.	57.61	(57.2)
Mean . . .			1 45 57.582	61 1 52.08
Div., Flex., etc.			. .	− 0.07

B. A. C. 570.

1875.			h. m. s.	° ′ ″
Nov.	12	P.	1 46 6.49	130 27 18.8
	24	F.	6.55	14.0
	27	F.	6.51	12.5
Mean . . .			1 46 6.517	130 27 15.10
Div., Flex., etc.			. .	+ 0.36

B. A. C. 578.

1875.			h. m. s.	° ′ ″
Oct.	25	Sk.	1 48 0.18	129 12 45.9
Nov.	12	P.	0.29	47.2
	27	F.	0.34	44.4
Mean . . .			1 48 0.270	129 12 45.83
Div., Flex., etc.			. .	+ 0.34

B. A. C. 609.

1875.			h. m. s.	° ′ ″
Sept.	14	P.	1 52 44.54	78 18 44.9
	27 (7.0)	F.	44.42	44.7
Oct.	25	Sk.	44.44	45.0
Mean . . .			1 52 44.467	78 18 44.87
Div., Flex., etc.			. .	− 0.37

DURCH. 2°, 315.

1875.			h. m. s.	° ′ ″
Sept.	4	P.	1 55 22.55	87 43 35.4
Div., Flex., etc.			. .	− 0.05

B. A. C. 625¹.

1875.			h. m. s.	° ′ ″
Oct.	28	P.	1 55 34.69	87 50 25.4
	29	Sk.	34.76	. .
Nov.	2	P.	34.75	24.9
Mean . . .			1 55 34.733	87 50 25.15
Div., Flex., etc.			. .	− 0.04

B. A. C. 625².

1875.			h. m. s.	° ′ ″
July	23 (3.5)	F.	1 55 34.88	87 50 28.1
Oct.	28	P.	34.86	28.7
	29	Sk.	34.93	. .
Nov.	2	P.	34.92	28.3
Mean . . .			1 55 34.898	87 50 28.37
Div., Flex., etc.			. .	− 0 04

B. A. C. 627.

1875.			h. m. s.	° ′ ″
Sept.	8	P.	1 55 39.91	120 36 13.9
	24	P.	39.85	11.4
	27 (6.0)	F.	39.96	11.4
Mean . . .			1 55 39.907	120 36 12.23
Div., Flex., etc.			. .	+ 0.25

DURCH. 10°, 285.

1875.			h. m. s.	° ′ ″
Nov.	8	F.	1 53 11.13	79 47 43.1
	12	P.	11.13	45.4
	17	P.	11.01	44.9
	24	F.	11.10	42.9
Mean . . .			1 58 11.092	79 47 44.08
Div., Flex., etc.			. .	− 0.40

B. A. C. 713.

1875.			h. m. s.	° ′ ″
Jan.	11 (7.0)	E.	2 12 (2.24)	126 33 52.8
	14	Sk.	1.98	52.3
	15	E.	1.93	52.9
Sept.	8	P.	2.07	51.0
Mean . . .			2 12 1.993	126 33 52.25
Div., Flex., etc.			. .	+ 0.27

B. A. C. 746.

1875.			h. m. s.	° ′ ″
Jan.	14	Sk.	2 17 57.31	128 8 39.0
	15	E.	57.14	42.1
Sept.	8	P.	57.25	40.1
Mean . . .			2 17 57.233	128 8 40.40
Div., Flex., etc.			. .	+ 0.31

B. A. C. 751.

1875.			h. m. s.	° ′ ″
Jan.	11	E.	2 19 32.09	131 24 42.5
Div., Flex., etc.			. .	+ 0.38

LALANDE, 4528.

1875.			h. m. s.	° ′ ″
Oct.	16	P.	2 20 38.88	73 55 6.0
	20	P.	38.95	5.1
	25	Sk.	38.84	4.8
Mean . . .			2 20 38.890	73 55 5.30
Div , Flex., etc.			. .	− 0.40

B. A. C. 765.

1875.			h. m. s.	° ′ ″
Oct.	16	P.	2 22 (44.13)	124 22 20.0
	25	Sk.	44.42	18.7
	27	F.	44.46	19.3
Mean . . .			2 22 44.440	124 22 19.33
Div., Flex., etc.			. .	+ 0.22

B. A. C. 783.

1875.			h. m. s.	° ′ ″
Jan.	14	Sk.	2 27 5.81	126 58 50.5
Sept.	8	P.	5.78	50.8
Oct.	25	Sk.	5.70	51.0
Mean . . .			2 27 5.763	126 58 50.77
Div., Flex., etc.			. .	+ 0.29

B. A. C. 788.

1875.			h. m. s.	° ′ ″
Jan.	11	E.	2 27 54.35	125 12 5.1
Sept.	8	P.	54.33	2.0
Oct.	16	P.	(54.10)	2.0
Mean . . .			2 27 54.340	125 12 3.03
Div., Flex., etc.			. .	+ 0.22

Lalande 4803.

1875.			h. m. s.	° ′ ″
Dec.	13	E.	2 29 13.75	83 42 40.4
	17	E.	13.80	39.2
	18	F.	13.92	38.4
	22	F.	13.86	40.2
	27	Sk.	13.90	37.7
Mean . . .			2 29 13.846	83 42 39.18
Div., Flex., etc.			. .	− 0.19

Lalande 4830.

1875.			h. m. s.	° ′ ″
Nov.	27	F.	2 30 34.20	52 48 56.1*
Div., Flex., etc.			. .	− 0.17

* This N. P. D. may be one rev. (15″.3) too great.

B. A. C. 812.

1875.			h. m. s.	° ′ ″
Jan.	11	E.	2 32 (55.53)	120 43 59.5
Sept.	8	P.	55.35	59.7
Oct.	20	P.	55.35	43 59.1
	25	Sk.	55.26	44 1.0
Mean . . .			2 32 55.320	120 43 59.82
Div., Flex., etc.			. .	+ 0.25

B. A. C. 818.

1875.			h. m. s.	° ′ ″
Oct.	16	P.	2 33 22.04	128 31 44.6
	28	P.	22.37	48.1
	29	Sk.	22.63	45.8
Nov.	2	P.	22.37	48.5
Mean . . .			2 33 22.352	128 31 46.75
Div., Flex., etc.			. .	+ 0.32

B. A. C. 832.

1875.			h. m. s.	° ′ ″
Sept.	8	P.	2 35 44.04	130 23 29.3
Oct.	27	F.	44.12	27.8
	28	P.	43.98	31.6
Mean . . .			2 35 44.047	130 23 29.57
Div., Flex., etc.			. .	+ 0.36

B. A. C. 840.

1875.			h. m. s.	° ′ ″
Oct.	25	Sk.	2 37 7.88	128 55 5.5
	27	F.	8.01	3.2
	29	Sk.	8.22	4.5
Mean . . .			2 37 8.037	128 55 4.40
Div., Flex., etc.			. .	+ 0.33

B. A. C. 853.

1875.			h. m. s.	° ′ ″
Nov.	12	P.	2 38 29.26	131 3 36.9
	24	F.	29.16	33.3
	27	F.	29.17	37.5
Mean . . .			2 38 29.197	131 3 35.90
Div., Flex., etc.			. .	+ 0.37

B. A. C. 855.

1875.			h. m. s.	° ′ ″
Oct.	28	P.	2 39 5.98	123 3 14.9
Nov.	2	P.	5.95	14.5
	10	Sk.	5.86	12.3
Mean . . .			2 39 5.930	123 3 13.90
Div., Flex., etc.			. .	+ 0.23

B. A. C. 873.

1875.			h. m. s.	° ′ ″
Nov.	12	P.	2 42 29.60	126 4 22.9
Dec.	13	E.	29.52	22.4
	20	P.	29.48	23.3
Mean . . .			2 42 29.533	126 4 22.87
Div., Flex., etc.			. .	+ 0.24

B. A. C. 872.

1875.			h. m. s.	° ′ ″
Oct.	20	P.	2 42 37.69	63 15 22.9
	27	F.	37.85	22.8
Dec.	2	F.	37.79	22.8
	17	E.	37.80	23.4
Mean . . .			2 42 37.782	63 15 22.98
Div., Flex., etc.			. .	− 0.10

B. A. C. 871.

1875.			h. m. s.	° ′ ″
Sept.	8	P.	2 42 41.94	52 11 50.8
Oct.	16	P.	41.87	51.6
	25	Sk.	(41.66)	51.4
	28	P.	41.84	52.4
Nov.	11	E.	41.95	52.0
Mean . . .			2 42 41.900	52 11 51.64
Div., Flex., etc.			. .	− 0.25

B. A. C. 878.[1]

1875.			h. m. s.	° ′ ″
Oct.	29	Sk.	2 43 38.70	127 55 22.6
Nov.	5	P.	38.46	26.8
Dec.	13	E.	38.51	27.9
Mean . . .			2 43 38.557	127 55 25.77
Div., Flex., etc.			. .	+ 0.31

B. A. C. 879.

1875.			h. m. s.	° ′ ″
Nov.	12	P.	2 43 51.58	122 55 56.2
Dec.	20	P.	51.55	55.2
	27	Sk.	51.60	54.6
Mean . . .			2 43 51.577	122 55 55.33
Div., Flex., etc.			. .	+ 0.23

B. A. C. 881.

1875.			h. m. s.	° ′ ″
Feb.	9 (5.0)	F.	2 44 35.61	75 26 4.3
	13	F.	35.64	4.8
	16	E.	35.55	4.3
Oct.	19 (6.0)	F.	35.67	4.1
Mean . . .			2 44 35.618	75 26 4.38
Div., Flex., etc.			. .	− 0.36

B. A. C. 886.

1875.			h. m. s.	° ′ ″
Nov.	2	P.	2 45 11.47	126 21 45.3
	10	Sk.	11.41	43.7
Dec.	2	F.	11.64	45.1
Mean . . .			2 45 11.507	126 21 44.70
Div., Flex., etc.			. .	+ 0.26

Weisse 794.

1875.			h. m. s.	° ′ ″
Dec.	22	F.	2 47 11.49	85 24 10.0
	27	Sk.	11.35	9.1
Mean . . .			2 47 11.420	85 24 9.55
Div., Flex., etc.			. .	− 0.08

B. A. C. 902.

1875.			h. m. s.	° ′ ″
Oct.	28	P.	2 48 40.56	128 56 59.4
	29	Sk.	(40.76)	(51.8)
Nov.	5	P.	40.37	59.0
Mean . . .			2 48 40.465	128 56 59.20
Div., Flex., etc.			. .	+ 0.33

ρ^2 Arietis.

1875.			h. m. s.	° ′ ″
Oct.	4	P.	2 48 47.10	72 10 34.8
	16	P.	47.13	35.6
	25	Sk.	46.99	34.4
Mean . . .			2 48 47.073	72 10 34.93
Div., Flex., etc.			. .	− 0.35

ρ^3 Arietis.

1875.			h. m. s.	° ′ ″
Oct.	16	P.	2 49 22.80	72 28 37.4
	20	P.	22.92	36.9
	25	Sk.	22.77	37.9
Mean . . .			2 49 22.830	72 28 37.40
Div., Flex., etc.			. .	− 0.35

B. A. C. 910.

1875.			h. m. s.	° ′ ″
Nov.	2	P.	2 50 19.35	99 23 49.0
	10	Sk.	19.32	50.6
Dec.	13	E.	19.36	50.6
	20	P.	19.31	49.8
Mean . . .			2 50 19.335	99 23 50.00
Div., Flex., etc.			. .	− 0.12

B. A. C. 921.

1875.			h. m. s.	° ′ ″
Feb.	9 (4.0)	F.	2 52 4.07	69 9 40.3
	13	F.	4.01	42.2
	16	E.	4.05	41.4
Mean . . .			2 52 4.043	69 9 41.30
Div., Flex., etc.			. .	− 0.29

B. A. C. 930.

1875.			h. m. s.	° ′ ″
Oct.	28	P.	2 52 40.24	128 41 40.6
Dec.	27	Sk.	40.22	39.2
Mean . . .			2 52 40.230	128 41 39.90
Div., Flex., etc.			. .	+ 0.32

B. A. C. 937.

1875.			h. m. s.	° ′ ″
Jan.	11	E.	2 53 31.44	130 48 24.7
Oct.	20	P.	31.32	23.8
	27	F.	31.46	23.3
Mean . . .			2 53 31.407	130 48 23.93
Div., Flex., etc.			. .	+ 0.37

B. A. C. 938.

1875.			h. m. s.	° ′ ″
Jan.	11	E.	2 53 32.29	130 48 24.0
Oct.	20	P.	32.10	23.2
	27	F.	32.35	23.4
Mean . . .			2 53 32.243	130 48 23.53
Div., Flex., etc.			. .	+ 0.37

B. A. C. 953.

1875.			h. m. s.	° ′ ″
May	31	F.	2 57 . .	51 38 46.3
Oct.	28	P.	10.28	45.1
Dec.	2	F.	10.32	45.3
	20	P.	. .	45.7
	22	F.	10.22	46.5
Mean . . .			2 57 10.273	51 38 45.78
Div., Flex., etc.			. .	− 0.30

B. A. C. 984.

1875.			h. m. s.	° ′ ″
Jan.	11	E.	3 3 45.78	125 54 28.2
Oct.	4	P.	45.67	27.1
	16	P.	45.47	26.3
Mean . . .			3 3 45.640	125 54 27.20
Div., Flex., etc.			. .	+ 0.24

B. A. C. 994.

1875.			h. m. s.	° ′ ″
Feb.	9 (5.0)	F.	3 6 23.66	91 39 55.1
	13	F.	23.75	56.4
	16	E.	23.72	55.0
Oct.	19 (5.5)	F.	23.78	54.1
Mean . . .			3 6 23.728	91 39 55.15
Div., Flex., etc.			. .	− 0.01

B. A. C. 997.

1875.			h. m. s.	° ′ ″
Oct.	28	P.	3 6 45.76	119 28 52.1
Nov.	10	Sk.	45.68	50.6
	11	E.	45.86	52.2
Mean . . .			3 6 45.767	119 28 51.63
Div., Flex., etc.			. .	+ 0.23

B. A. C. 1003.

1875.			h. m. s.	° ′ ″
Jan.	11	S.	3 8 7.73	126 24 46.3
Oct.	19 (6.5)	F.	7.65	44.6
	20	P.	7.62	45.3
Mean . . .			3 8 7.667	126 24 45.40
Div., Flex., etc.			. .	+ 0.26

B. A. C. 1005.

1875.			h. m. s.	° ′ ″
Nov.	10	Sk.	3 8 25.09	120 16 19.3
Dec.	13	E.	25.24	19.0
	20	P.	25.16	20.2
Mean . . .			3 8 25.163	120 16 19.50
Div., Flex., etc.			. .	+ 0.24

B. A. C. 1009.

1875.			h. m. s.	° ′ ″
Nov.	12	P.	3 9 6.98	129 16 29.5
Dec.	22	F.	7.10	33.9
	27	Sk.	6.94	32.7
Mean . . .			3 9 7.007	129 16 32.03
Div., Flex., etc.			. .	+ 0.34

B. A. C. 1015.

1875.			h. m. s.	° ′ ″
Nov.	11	E.	3 9 45.29	126 1 24.9
Dec.	20	P.	45.16	27.3
	27	Sk.	45.21	28.6
Mean . . .			3 9 45.220	126 1 26.93
Div., Flex., etc.			. .	+ 0.24

B. A. C. 1013.

1875.			h. m. s.	° ′ ″
Feb.	9 (5.0)	F.	3 9 45.74	99 17 7.5
	13	F.	. .	9.2
	16	E.	45.74	8.0
Mean . . .			3 9 45.740	99 17 8.23
Div., Flex., etc.			. .	− 0.12

B. A. C. 1021.

1875.			h. m. s.	° ′ ″
Nov.	5	P.	3 11 38.75	126 9 7.9
	30	Sk.	38.87	6.8
Dec.	20	P.	38.81	9.2
Mean . . .			3 11 38.810	126 9 7.97
Div., Flex., etc.			. .	+ 0.25

B. A. C. 1037.

1875.			h. m. s.	° ′ ″
Feb.	18	S.	3 13 57.53	112 12 51.1
Nov.	11	E.	57.50	51.4
	12	P.	57.48	51.6
Dec.	13	E.	57.50	52.0
	22	F.	57.62	53.8
Mean . . .			3 13 57.526	112 12 51.98
Div., Flex., etc.			. .	+ 0.06

B. A. C. 1034.

1875.			h. m. s.	° ′ ″
Feb.	9	F.	3 14 0.77	69 18 17.7
	13	F.	0.84	19.5
Oct.	19 (5.0)	F.	0.77	17.7
Mean . . .			3 14 0.793	69 18 18.30
Div., Flex., etc.			. .	− 0.30

B. A. C. 1040.

1875.			h. m. s.	° ′ ″
Feb.	16	E.	3 14 41.80	62 50 35.5
Oct.	20	P.	41.79	34.8
Nov.	2	P.	41.80	35.6
Mean . . .			3 14 41.797	62 50 35.30
Div., Flex., etc.			. .	− 0.09

B. A. C. 1052.

1875.			h. m. s.	° ′ ″
Feb.	9 (6.0)	F.	3 16 55.83	65 43 12.4
Oct.	19 (6.5)	F.	55.80	15.1
	27	F.	55.81	13.0
Mean . . .			3 16 55.813	65 43 13.50
Div., Flex., etc.			. .	− 0.16

B. A. C. 1057.

1875.			h. m. s.	° ′ ″
Feb.	16	E.	3 18 5.30	81 24 48.5
	18	S.	. .	47.6
	27	Sk.	5.27	48.0
Nov.	2	P.	5.27	45.4
Mean . . .			3 18 5.280	81 24 47.38
Div., Flex., etc.			. .	− 0.36

B. A. C. 1060.

1875.			h. m. s.	° ′ ″
Oct.	28	P.	3 18 43.56	123 9 8.0
	29	Sk.	43.63	. .
Nov.	5	P.	43.46	5.4
	10	Sk.	43.47	6.3
Mean . . .			3 18 43.530	123 9 6.57
Div., Flex., etc.			. .	+ 0.23

B. A. C. 1068.

1875.			h. m. s.	° ′ ″
Feb.	9 (4.0)	F.	3 20 23.77	80 42 16.2
	13	F.	23.80	18.1
	16	E.	23.75	17.9
Mean . . .			3 20 23.773	80 42 17.40
Div., Flex., etc.			. .	− 0.39

B. A. C. 1074.

1875.			h. m. s.	° ′ ″
Nov.	10	Sk.	3 21 5.96	126 21 33.4
Dec.	20	P.	6.01	35.4
	22	F.	6.26	34.0
Mean . . .			3 21 6.077	126 21 34.27
Div., Flex., etc.			. .	+ 0.26

B. A. C. 1085.

1875.			h. m. s.	° ′ ″
Oct.	28	P.	3 23 22.15	126 17 15.7
Dec.	20	P.	22.17	15.4
	22	F.	22.25	15.7
Mean . . .			3 23 22.190	126 17 15.60
Div., Flex., etc.			. .	+ 0.25

B. A. C. 1090.

1875.			h. m. s.	° ′ ″
Feb.	9 (5.0)	F.	3 24 24.95	95 30 19.2
	13 (6.0)	F.	25.05	20.2
	15	Sk.	25.10	19.2
Mean . . .			3 24 25.033	95 30 19.53
Div., Flex., etc.			. .	+ 0.08

B. A. C. 1092.

1875.			h. m. s.	° ′ ″
Feb.	9 (6.5)	F.	3 25 50.26	81 3 2.4
	16	E.	50.19	4.5
Oct.	19 (7.0)	F.	50.31	2.2
Mean . . .			3 25 50.253	81 3 3.03
Div., Flex., etc.			. .	− 0.38

B. A. C. 1100.

1875.			h. m. s.	° ′ ″
Feb.	18	S.	3 27 2.57	99 52 58.3
	28	E.	2.53	53 1.0
Oct.	4	P.	2.54	52 57.5
Mean . . .			3 27 2.547	99 52 58.93
Div., Flex., etc.			. .	− 0.12

B. A. C. 1121.

1875.			h. m. s.	° ′ ″
Oct.	20	P.	3 32 2.90	120 14 30.6
Nov.	10	Sk.	2.80	29.1
	12	P.	2.94	32.3
Mean . . .			3 32 2.880	120 14 30.67
Div., Flex., etc.			. .	+ 0.24

B. A. C. 1134.

1875.			h.	m.	s.	°	'	"
Feb.	13	F.	3	34	27.14	95	36	59.5
	15	Sk.			27.20			59.0
	16	E.			27.11			57.7
Mean . . .			3	34	27.150	95	36	58.73
Div., Flex., etc.					. .			+ 0.08

B. A. C. 1136^2.

1875.			h.	m.	s.	°	'	"
Jan.	16	F.	3	35	17.27	130	45	31.9
Nov.	10	Sk.			17.24			29.6
Dec.	20	P.			17.26			32.9
Mean . . .			3	35	17.257	130	45	31.47
Div., Flex., etc.					. .			+ 0.37

B. A. C. 1145.

1875.			h.	m.	s.	°	'	"
Jan.	16	F.	3	36	43.97	131	10	17.2
Oct.	28	P.			44.05			12.5
Dec.	20	P.			43.83			16.2
Mean . . .			3	36	43.950	131	10	15.30
Div., Flex., etc.					. .			+ 0.37

B. A. C. 1147.

1875.			h.	m.	s.	°	'	"
Feb.	9	F.	3	37	27.32	66	16	52.8
	13 (6.0)	F.			. .			56.1
	15	Sk.			27.42			54.1
	27	Sk.			27.38			54.2
Mean . . .			3	37	27.373	66	16	54.05
Div., Flex., etc.					. .			— 0.17

B. A. C. 1149.

1875.			h.	m.	s.	°	'	"
Feb.	18	S.	3	37	42.33	65	33	18.9
	26	S.			42.47			19.2
Oct.	19	F.			42.39			18.3
Mean . . .			3	37	42.397	65	33	18.80
Div., Flex., etc.					. .			— 0.16

B. A. C. 1194.

1875.			h.	m.	s.	°	'	"
Nov.	5	P.	3	42	52.95	120	32	44.9
Dec.	20	P.			53.13			46.1
	27	Sk.			53.21			43.7
Mean . . .			3	42	53.097	120	32	44.90
Div., Flex., etc.					. .			+ 0.25

B. A. C. 1212.

1875.			h.	m.	s.	°	'	"
Feb.	26	S.	3	46	31.28	95	44	11.8
Oct.	19 (7.0)	F.			31.31			9.6
Nov.	2	P.			31.19			10.0
Mean . . .			3	46	31.260	95	44	10.47
Div., Flex., etc.					. .			+ 0.08

B. A. C. 1216^1.

1875.			h.	m.	s.	°	'	"
Oct.	19 (8.0)	F.	3	48	0.92	93	19	25.3
Nov.	10	Sk.			0.73			26.9
Mean . . .			3	48	0.825	93	19	26.10
Div., Flex., etc.					. .			+ 0.06

B. A. C. 1216^2.

1875.			h.	m.	s.	°	'	"
Feb.	13 (6.0)	F.	3	48	0.94	93	19	33.4
Oct.	19 (6.5)	F.			1.01			32.1
Nov.	10	Sk.			0.88			35.0
Mean . . .			3	48	0.943	93	19	33.50
Div., Flex., etc.					. .			+ 0.06

B. A. C. 1221.

1875.			h.	m.	s.	°	'	"
Feb.	16	E.	3	49	28.96	67	53	2.8
Oct.	19	F.			28.97			3.0
Nov.	8	F.			29.02			1.7
Mean . . .			3	49	28.983	67	53	2.50
Div., Flex., etc.					. .			— 0.23

B. A. C. 1236.

1875.			h.	m.	s.	°	'	"
Oct.	20	P.	3	52	0.92	129	19	29.4
	28	P.			1.02			31.9
Nov.	12	P.			1.00			30.7
Dec.	20	P.			0.86			32.3
Mean . . .			3	52	0.950	129	19	31.08
Div., Flex., etc.					. .			+ 0.34

B. A. C. 1241.

1875.			h.	m.	s.	°	'	"
Feb.	26	S.	3	53	45.37	77	51	53.5
	27	Sk.			45.37			54.2
	28	E.			45.37			54.7
Mean . . .			3	53	45.370	77	51	54.13
Div., Flex., etc.					. .			— 0.36

B. A. C. 1251.

1875.			h.	m.	s.	°	'	"
Feb.	9 (5.0)	F.	3	56	30.38	84	21	32.9
	13 (5.5)	F.			30.44			34.7
	15	Sk.			30.55			33.9
Mean . . .			3	56	30.457	84	21	33.83
Div., Flex., etc.					. .			— 0.14

B. A. C. 1253.

1875.			h.	m.	s.	°	'	"
Feb.	16	E.	3	56	53.17	66	14	24.6
	17 (5.0)	F.			53.21			26.7
	22	S.			53.16			27.5
Mean . . .			3	56	53.180	66	14	26.27
Div., Flex., etc.					. .			— 0.16

B. A. C. 1265.

1875.			h.	m.	s.	°	'	"
Feb.	26	S.	3	59	16.93	61	20	19.2
	27	Sk.			16.92			21.7
	28	E.			. .			21.9
Oct.	28	P.			16.92			18.8
Nov.	2	P.			16.91			20.2
Mean . . .			3	59	16.920	61	20	20.36
Div., Flex., etc.					. .			— 0.07

B. A. C. 1275.

1875.			h.	m.	s.	°	'	"
Feb.	9 (6.0)	F.	4	2	2.88	76	56	3.9
	13	F.			2.88			8.5
	15	Sk.			2.86			6.2
	16	E.			2.77			7.5
	22	S.			2.80			7.9
Mean . . .			4	2	2.838	76	56	6.80
Div., Flex., etc.					. .			— 0.33

B. A. C. 1285.

1875.			h.	m.	s.	°	'	"
Feb.	9 (7.0)	F.	4	4	41.04	84	48	16.3
	13	F.			41.18			16.4
	15	Sk.			41.11			15.4
	16	E.			41.06			15.6
Mean . . .			4	4	41.098	84	48	15.92
Div., Flex., etc.					. .			— 0.11

B. A. C. 1294.

1875.			h.	m.	s.	°	'	"
Jan.	11	E.	4	6	6.94	125	35	55.4
	14	Sk.			6.94			55.3
Feb.	5 (6.0)	F.			7.00			55.7
Mean . . .			4	6	6.960	125	35	55.47
Div., Flex., etc.					. .			+ 0.23

B. A. C. 1296.

1875.			h.	m.	s.	°	'	"
Feb.	26	S.	4	6	49.37	82	36	19.5
	27	Sk.			49.35			20.4
	28	E.			. .			19.0
Mean . . .			4	6	49.360	82	36	19.63
Div., Flex., etc.					. .			— 0.28

B. A. C. 1302.

1875.			h.	m.	s.	°	'	"
Feb.	26	S.	4	8	40.61	74	54	50.8
Oct.	19 (7.0)	F.			40.65			51.1
	20	P.			40.66			49.7
Mean . . .			4	8	40.640	74	54	50.53
Div., Flex., etc.					. .			— 0.38

B. A. C. 1310.

1875.			h.	m.	s.	°	'	"
Jan.	11	E.	4	9	18.55	130	41	36.9
	14	Sk.			18.56			35.1
	18	S.			18.59			37.9
Mean . . .			4	9	18.567	130	41	36.63
Div., Flex., etc.					. .			+ 0.37

B. A. C. 1312.

1875.			h.	m.	s.	°	'	"
Feb.	16 (6.0)	E.	4	9	26.04	127	20	49.9
	22	S.			26.23			53.2
Oct.	28	P.			26.10			49.8
Dec.	22	F.			25.95			43.7
Mean . . .			4	9	26.080	127	20	49.15
Div., Flex., etc.					. .			+ 0.30

B. A. C. 1321.

1875.			h.	m.	s.	°	'	"
Feb.	26	S.	4	12	4.18	69	9	45.1
	27	Sk.			4.09			44.4
	28	E.			4.11			45.0
Mean . . .			4	12	4.127	69	9	44.83
Div., Flex., etc.					. .			— 0.29

B. A. C. 1330.

1875.			h.	m.	s.	°	'	"
Feb.	9 (6.5)	F.	4	12	55.42	76	16	4.8
	13 (6.0)	F.			55.43			5.8
	15	Sk.			55.44			7.4
Mean . . .			4	12	55.430	76	16	6.00
Div., Flex., etc.					. .			— 0.34

B. A. C. 1333.

1875.			h. m. s.	° ′ ″
Jan.	11	E.	4 13 9.90	124 6 17.6
	22	Sk.	9.92	19.4
Feb.	5 (4.0)	F.	9.88	20.0
	17 (4.0)	F.	9.87	20.9
Mean . . .			4 13 9.892	124 6 19.48
Div., Flex., etc.			. .	+ 0.22

B. A. C. 1341.

1875.			h. m. s.	° ′ ″
Oct.	4	P.	4 14 58.61	64 40 2.9
	17	Sk.	58.64	4.0
	20	P.	58.63	3.3
Mean . . .			4 14 58.627	64 40 3.40
Div., Flex., etc.			. .	− 0.14

B. A. C. 1342.

1875.			h. m. s.	° ′ ″
Oct.	28	P.	4 15 1.75	69 28 35.0
Nov.	5	P.	1.71	34.1
	8	F.	1.68	33.0
Mean . . .			4 15 1.713	69 28 34.03
Div., Flex., etc.			. .	− 0.30

B. A. C. 1346.

1875.			h. m. s.	° ′ ″
Feb.	9 (5.0)	F.	4 15 43.65	72 45 8.9
	13 (5.0)	F.	43.60	12.6
	15	Sk.	43.65	11.3
Mean . . .			4 15 43.633	72 45 10.93
Div., Flex., etc.			. . .	− 0.36

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1875.			h. m. s.	° ′ ″
Oct.	4	P.	4 16 27.65	65 59 32.2
	17	Sk.	27.59	31.3
	20	P.	27.61	31.4
Mean . . .			4 16 27.617	65 59 31.63
Div., Flex., etc.			. .	− 0.16

B. A. C. 1356.

1875.			h. m. s.	° ′ ″
Feb.	26	S.	4 16 53.46	72 50 52.4
	27	Sk.	53.47	52.2
	28	E.	53.47	53.2
Mean . . .			4 16 53.467	72 50 52.60
Div., Flex., etc.			. .	− 0.37

B. A. C. 1361.

1875.			h. m. s.	° ′ ″
Oct.	19	F.	4 17 40.14	71 14 48.0
Nov.	5	P.	40.12	50 8
	8	F.	40.20	49.6
Mean . . .			4 17 40.153	71 14 49.47
Div., Flex., etc.			. .	− 0.33

B. A. C. 1365.

1875.			h. m. s.	° ′ ″
Feb.	15	Sk.	4 18 15.47	72 21 37.5
	16	E.	15.59	37.8
	17	F.	15.55	36.8
Mean . . .			4 18 15.537	72 21 37.37
Div., Flex., etc.			. .	− 0.35

B. A. C. 1368.

1875.			h. m. s.	° ′ ″
Jan.	11	E.	4 18 32.64	125 50 14.0
	14	Sk.	32.51	15.8
Feb.	5 (6.5)	F.	32.55	17.9
	22 (5.0)	S.	(32.79)	17.3
Mean . . .			4 18 32.567	125 50 16.25
Div., Flex., etc.			. .	+ 0.24

B. A. C. 1372.

1875.			h. m. s.	° ′ ″
Feb.	5 (5.0)	F.	4 19 20.51	124 18 33.5
Dec.	12	P.	20.69	33.4
	22	F.	20.69	30.5
Mean . . .			4 19 20.630	124 18 32.47
Div., Flex., etc.			. .	+ 0.22

B. A. C. 1370.

1875.			h. m. s.	° ′ ″
Feb.	28	E.	4 19 32.64	75 34 18.2
Nov.	2	P.	32.74	16.5
	8	F.	32.78	15.8
Mean . . .			4 19 32.730	75 34 16.83
Div., Flex., etc.			. .	− 0.36

B. A. C. 1373.

1875.			h. m. s.	° ′ ″
Nov.	12	P.	4 20 35.76	68 39 40.1
	29	P.	35.80	41.8
	30	Sk.	35.69	40.5
Mean . . .			4 20 35.750	68 39 40.80
Div., Flex., etc.			. .	− 0.27

B. A. C. 1378.

1875.			h. m. s.	° ′ ″
Dec.	20	P.	4 21 18.65	75 32 22.1
	22	F.	18.57	21.7
Mean . . .			4 21 18.610	75 32 21.90
Div., Flex., etc.			. .	− 0.36

B. A. C. 1386.

1875.			h. m. s.	° ′ ″
Feb.	9 (7.0)	F.	4 22 4.47	88 53 51.6
	13	F.	4.56	57.3
	15	Sk.	4.52	54.7
Mean . . .			4 22 4.517	88 53 54.53
Div., Flex., etc.			. .	− 0.02

B. A. C. 1389.

1875.			h. m. s.	° ′ ″
Feb.	16	E.	4 22 24.84	130 48 44.9
Dec.	22	F.	25.01	47.0
	27	Sk.	24.76	43.2
Mean . . .			4 22 24.870	130 48 45.03
Div., Flex., etc.			. .	+ 0.37

B. A. C. 1388.

1875.			h. m. s.	° ′ ″
Nov.	12	P.	4 22 58.19	70 26 3.5
	29	P.	58.25	3.3
Mean . . .			4 22 58.220	70 26 3.40
Div., Flex., etc.			. .	− 0.32

ANONYMOUS.

1875.			h. m. s.	° ′ ″
Feb.	27	Sk.	4 23 37.72	80 25 51.1
Div., Flex., etc.			. .	− 0.39

B. A. C. 1407.

1875.			h. m. s.	° ′ ″
Feb.	4	E.	4 26 6.94	125 55 32.9
	15	Sk.	7.17	33.8
	16	E.	7.29	34.6
	22	S.	7.43	35.4
Mean . . .			4 26 7.208	125 55 34.18
Div., Flex., etc.			. .	+ 0.24

B. A. C. 1427.

1875.			h. m. s.	° ′ ″
Feb.	9 (7.0)	F.	4 29 47.71	93 52 10.5
	13 (6.5)	F.	47.77	10.0
	15	Sk.	47.73	11.7
	16	E.	47.71	10.7
Mean . . .			4 29 47.730	93 52 10.72
Div., Flex., etc.			. .	+ 0.08

B. A. C. 1431.

1875.			h. m. s.	° ′ ″
Feb.	9 (6.0)	F.	4 30 47.21	89 15 27.5
	13 (6.0)	F.	47.17	26.0
	15	Sk.	47.32	24.9
	17 (7.0)	F.	47.19	26.9
Mean . . .			4 30 47.222	89 15 26.32
Div., Flex., etc.			. .	− 0.02

B. A. C. 1434.

1875.			h. m. s.	° ′ ″
Feb.	26	S.	4 31 10.31	77 44 31.2
	27	Sk.	10.27	31.9
	28	E.	10.28	33.5
Mean . . .			4 31 10.287	77 44 32.20
Div., Flex., etc.			. .	− 0.35

B. A. C. 1440.

1875.			h. m. s.	° ′ ″
Jan.	14	Sk.	4 32 13.37	120 41 0.8
	22	Sk.	13.41	40 56.9
Feb.	18	S.	13.44	41 1.8
	22	S.	(13.64)	3.0
Nov.	10	Sk.	13.32	0.3
Mean . . .			4 32 13.385	120 41 0.56
Div., Flex., etc.			. .	+ 0.25

B. A. C. 1442.

1875.			h. m. s.	° ′ ″
Feb.	28	E.	4 33 5.91	78 3 2.4
Oct.	19 (6.5)	F.	5.98	3 0.5
	20	P.	5.89	2 58.9
Mean . . .			4 33 5.927	78 3 0.60
Div., Flex., etc.			. .	− 0.36

B. A. C. 1449.

1875.			h. m. s.	° ′ ″
Feb.	13	F.	4 34 . .	67 17 8.8
	15	Sk.	44.64	6.1
	16	E.	44.64	7.2
	17 (5.0)	F.	44.63	7.0
Mean . . .			4 34 44.637	67 17 7.28
Div., Flex., etc.			. .	− 0.20

B. A. C. 1453.

1875.			h. m. s.	° ′ ″
Oct.	19 (7.0)	F.	4 35 39.78	66 9 1.0
	20	P.	39.70	0.3
	21	Sk.	39.76	1.2
Mean . . .			4 35 39.747	66 9 0.83
Div., Flex., etc.			. .	− 0.16

B. A. C. 1460.

1875.		h. m. s.	° ′ ″
Feb. 26	S.	4 37 30.19	79 5 20.7
27	Sk.	30.17	20.3
Oct. 19 (6.0)	F.	. .	20.0
Mean . . .		4 37 30.180	79 5 20.33
Div., Flex., etc.		. .	— 0.39

B. A. C. 1464.

1875.		h. m. s.	° ′ ″
Feb. 4	E.	4 37 38.28	127 23 23.0
5 (6.0)	F.	38.29	25.3
15	Sk.	38.28	22.6
Mean . . .		4 37 38.283	127 23 23.63
Div., Flex., etc.		. .	+ 0.30

B. A. C. 1467.

1875.		h. m. s.	° ′ ″
Feb. 5 (6.0)	F.	4 38 19.57	120 59 58.2
18	S.	19.61	59.9
Nov. 10	Sk.	19.32	57.8
Mean . . .		4 38 19.500	120 59 58.63
Div., Flex., etc.		. .	+ 0.25

B. A. C. 1480.

1875.		h. m. s.	° ′ ″
Jan. 14	Sk.	4 41 12.13	124 14 2.6
22	Sk.	12.10	2.0
Feb. 1 (7.0)	F.	11.93	4.8
4	E.	11.99	4.9
Mean . . .		4 41 12.038	124 14 3.58
Div., Flex., etc.		. .	+ 0.22

B. A. C. 1483.

1875.		h. m. s.	° ′ ″
Feb. 16	E.	4 41 42.05	129 35 2.7
26 (5.5)	S.	42.09	35 2.4
Oct. 21	Sk.	42.35	34 56.8
Mean . . .		4 41 42.163	129 35 0.63
Div., Flex., etc.		. .	+ 0.35

B. A. C. 1488.

1875.		h. m. s.	° ′ ″
Feb. 27	Sk.	4 42 56.96	120 15 1.8
Oct. 20	P.	57.03	0.8
21	Sk.	(57.48)	1.9
Mean . . .		4 42 56.995	120 15 1.50
Div., Flex., etc.		. .	+ 0.24

B. A. C. 1486.

1875.		h. m. s.	° ′ ″
Feb. 9 (3.5)	F.	4 43 3.22	83 15 32.5
11	Sk.	3.39	34.4
13 (4.0)	F.	3.30	35.5
Mean . . .		4 43 3.303	83 15 34.13
Div., Flex., etc.		. .	— 0.23

B. A. C. 1493.

1875.		h. m. s.	° ′ ″
Feb. 13 (6.5)	F.	4 44 3.74	71 22 31.1
15	Sk.	3.76	30.4
16	E.	3.85	30.3
Mean . . .		4 44 3.783	71 22 30.60
Div., Flex., etc.		. .	— 0.33

B. A. C. 1515.

1875.		h. m. s.	° ′ ″
Feb. 9 (5.0)	F.	4 47 50.97	78 46 48.9
13 (7.0)	F.	50.97	50.9
15	Sk.	50.95	50.0
Mean . . .		4 47 50.963	78 46 49.93
Div., Flex., etc.		. .	— 0.38

B. A. C. 1519.

1875.		h. m. s.	° ′ ″
Feb. 9	F.	4 48 25.65	89 44 12.4
15	Sk.	25.60	14.2
16	E.	25.59	10.8
Mean . . .		4 48 25.613	89 44 12.47
Div., Flex., etc.		. .	— 0.01

B. A. C. 1528.

1875.		h. m. s.	° ′ ″
Feb. 27	Sk.	4 50 30.42	65 8 41.9
Oct. 19	F.	30.55	41.7
20	P.	30.45	40.5
Mean . . .		4 50 30.473	65 8 41.37
Div., Flex., etc.		. .	— 0.15

B. A. C. 1533.

1875.		h. m. s.	° ′ ″
Jan. 14	Sk.	4 50 43.70	129 49 53.0
Feb. 1 (6.5)	F.	43.51	52.8
Oct. 21	Sk.	44.00	54.3
Mean . . .		4 50 43.737	129 49 53.37
Div., Flex., etc.		. .	+ 0.35

LALANDE 9335.

1875.		h. m. s.	° ′ ″
Feb. 26	S	4 51 51.75	75 38 39.6
27	Sk.	51.64	40.6
Oct. 19	F.	51.74	39.6
Mean . . .		4 51 51.710	75 38 39.93
Div., Flex., etc.		. .	— 0.35

B. A. C. 1537.

1875.		h. m. s.	° ′ ″
Feb. 26	S.	4 51 54.01	75 39 1.7
27	Sk.	53.86	1.9
Oct. 19	F.	53.99	2.1
Mean . . .		4 51 53.953	75 39 1.90
Div., Flex., etc.		. .	— 0.35

B. A. C. 1551.

1875.		h. m. s.	° ′ ″
Feb. 26	S.	4 55 37.52	68 35 27.5
28	E.	37.45	29.7
Mar. 8	E.	37.54	29.1
Mean . . .		4 55 37.503	68 35 28.77
Div.. Flex., etc.		. .	— 0.27

LALANDE 9484.

1875.		h. m. s.	° ′ ″
Oct. 20	P.	4 56 49.07	62 28 49.5
21	Sk.	49.17	50.9
28	P.	49.13	51.5
Mean . . .		4 56 49.123	62 28 50.63
Div., Flex., etc.		. .	— 0.07

B. A. C. 1564.

1875.		h. m. s.	° ′ ″
Jan. 22	Sk.	4 57 39.23	121 57 15.7
Feb. 1 (6.0)	F.	38.93	18.7
15	Sk.	39.14	15.6
17 (6.0)	F.	39.04	13.3
18	S.	39.12	18.1
Mean . . .		4 57 39.092	121 57 16.28
Div., Flex., etc.		. .	+ 0.25

B. A. C. 1573.

1875.		h. m. s.	° ′ ″
Jan. 14	Sk.	4 59 54.68	125 39 18.2
Feb. 5 (6.0)	F.	54.62	20.1
17 (4.0)	F.	54.67	20.5
26 (5.5)	S.	54.81	20.9
Mean . . .		4 59 54.695	125 39 19.92
Div., Flex., etc.		. .	+ 0.23

B. A. C. 1574.

1875.		h. m. s.	° ′ ″
Jan. 22	Sk.	4 59 58.53	125 52 51.6
Nov. 29	P	58.50	51.1
Dec. 12	P.	58.52	51.1
Mean . . .		4 59 58.517	125 52 51.27
Div., Flex., etc.		. .	+ 0.24

B. A. C. 1568.

1875.		h. m. s.	° ′ ″
Feb. 9 (5.0)	F.	5 0 3.69	71 31 29.4
11	Sk.	3.70	30.6
15	Sk.	3.81	30.9
Mean . . .		5 0 3.733	71 31 30.30
Div., Flex., etc.		. .	— 0.34

B. A. C. 1570.

1875.		h. m. s.	° ′ ″
Mar. 8	E.	5 0 24.61	69 44 56.5
Oct. 20	P.	24.56	55.3
21	Sk.	24.73	55.5
Mean . . .		5 0 24.633	69 44 55.77
Div., Flex., etc.		. .	— 0.30

B. A. C. 1588.

1875.		h. m. s.	° ′ ″
Feb. 1 (3.0)	F.	5 1 . .	95 15 1.0
Dec. 12	P.	42.40	14 58.8
20	P.	42.28	14 59.3
22	F.	42.30	15 1.1
Mean . . .		5 1 42.327	95 15 0.05
Div., Flex., etc.		. .	+ 0.09

B. A. C. 1591.

1875.		h. m. s.	° ′ ″
Feb. 9	F.	5 2 32.73	74 33 51.6
13 (5.0)	F.	32.68	54.5
15	Sk.	32.76	53.8
Mean . . .		5 2 32.723	74 33 53.30
Div., Flex., etc.		. .	— 0.39

B. A. C. 1599.

1875.		h. m. s.	° ′ ″
Feb. 26 (7.5)	S.	5 3 47.78	125 52 52.6
Oct. 20	P.	47.66	52.5
Nov. 29	P.	47.80	51.7
Mean . . .		5 3 47.747	125 52 52.27
Div., Flex., etc.		. .	+ 0.24

B. A. C. 1601.

1875.		h. m. s.	° ′ ″
Feb. 28	E.	5 4 30.83	74 6 41.3
Mar. 4	E.	30.78	41.9
8	E.	30.81	42.4
Mean . . .		5 4 30.807	74 6 41.87
Div., Flex., etc.		. .	— 0.40

B. A. C. 1611.

1875.		h. m. s.	° ′ ″
Feb. 9 (5.0)	F.	5 6 45.41	87 17 22.1
11	Sk.	45.47	22.9
13 (4.0)	F.	45.37	25.2
Mean . . .		5 6 45.417	87 17 23.40
Div., Flex., etc.		. .	− 0.06

Durch. 27°, 744.

1875.		h. m. s.	° ′ ″
Feb. 14	S.	5 9 2.42	62 26 ±

B. A. C. 1630.

1875.		h. m. s.	° ′ ″
Jan. 14	Sk.	5 9 20.21	125 58 12.9
22	Sk.	20.48	13.4
Feb. 15	Sk.	20.24	13.0
Mean . . .		5 9 20.310	125 58 13.10
Div., Flex., etc.		. .	+ 0.24

B. A. C. 1627.

1875.		h. m. s.	° ′ ″
Feb. 26	S.	5 9 58.45	56 45 40.4
Oct. 19	F.	58.55	40.6
21	Sk.	58.56	39.6
Mean . . .		5 9 58.520	56 45 40.20
Div., Flex., etc.		. .	+ 0.04

B. A. C. 1633.

1875.		h. m. s.	° ′ ″
Nov. 12	P.	5 10 3.53	126 7 18.4
Dec. 12	P.	3.67	17.8
20	P.	3.50	18.7
Mean . . .		5 10 3.567	126 7 18.30
Div., Flex., etc.		. .	+ 0.25

Weisse (2) 245.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	5 10 29.46	56 36 47.4
Oct. 19 (8.5)	F.	. .	42.7
20	P	29.52	44.9
Mean . . .		5 10 29.490	56 36 45.00
Div., Flex., etc.		. .	+ 0.05

Weisse (2) 247.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	5 10 29.67	56 36 31.2
Oct. 19 (8.5)	F.	. .	29.2
20	P.	29.63	30.3
Mean . . .		5 10 29.650	56 36 30.23
Div., Flex., etc.		. .	+ 0.05

B. A. C. 1644.

1875.		h. m. s.	° ′ ″
Feb. 16	E.	5 11 48.70	123 40 33.8
Nov. 12	P.	48.87	33.0
29	P.	48.73	34.4
Mean . . .		5 11 48.767	123 40 33.73
Div., Flex., etc.		. .	+ 0.22

B. A. C. 1650.

1875.		h. m. s.	° ′ ″
Feb. 1	E.	5 12 58.58	125 1 9.4
15	Sk.	58.63	7.0
Oct. 21	Sk.	58.96	7.1
Mean . . .		5 12 58.723	125 1 7.83
Div., Flex., etc.		. .	+ 0.21

B. A. C. 1660.

1875.		h. m. s.	° ′ ″
Feb. 9	F.	5 15 22.84	90 30 26.6
11	Sk.	22.94	29.9
13	F.	22.96	. .
Mean . . .		5 15 22.913	90 30 28.25
Div., Flex., etc.		. .	− 0.02

B. A. C. 1666.

1875.		h. m. s.	° ′ ″
Jan. 14	Sk.	5 15 50.62	124 49 31.0
22	Sk	50.75	32.5
Feb. 4	E.	50.68	34.0
5 (6.5)	F.	50.59	34.0
Mean . . .		5 15 50.660	124 49 32.88
Div., Flex., etc.		. .	+ 0.21

B. A. C. 1663.

1875.		h. m. s.	° ′ ″
Feb. 26	S.	5 16 9.47	52 44 2.8
Mar. 4	E.	9.44	4.1
8	E.	9.55	3.0
Mean . . .		5 16 9.487	52 44 3.30
Div., Flex., etc.		. .	− 0.18

B. A. C. 1665^1.

1875.		h. m. s.	° ′ ″
Feb. 11	Sk.	5 16 15.82	86 34 43.2
13	F.	15.89	45.0
15	Sk.	15.85	41.8
Mean . . .		5 16 15.853	86 34 43.33
Div., Flex., etc.		. .	− 0.07

B. A. C. 1665^2.

1875.		h. m. s.	° ′ ″
Feb. 15	Sk.	5 16 16.89	86 34 12.3
Div., Flex., etc.		. .	− 0.07

B. A. C. 1693.

1875.		h. m. s.	° ′ ″
Feb. 16	E.	5 19 16.57	129 47 44.2
Oct. 21	Sk.	16.85	43.3
Nov. 12	P.	16.50	42.5
Mean . . .		5 19 16.640	129 47 43.33
Div., Flex., etc.		. .	+ 0.35

B. A. C. 1694.

1875.		h. m. s.	° ′ ″
Feb. 4	E.	5 19 20.36	127 27 12.3
15	Sk.	20.45	13.5
Oct. 20	P.	20.51	13.3
Mean . . .		5 19 20.440	127 27 13.03
Div., Flex., etc.		. .	+ 0.30

O. Arg. S. 3957.

1875.		h. m. s.	° ′ ″
Mar. 8 (7.0)	E.	5 21 2.68	110 49 36.6
Oct. 19 (8.0)	F.	2.80	31.9
20	P.	2.65	29.9
Mean . . .		5 21 2.710	110 49 32.80
Div., Flex., etc.		. .	− 0.01

β Leporis.

1875.		h. m. s.	° ′ ″
Mar. 8	E.	5 22 53.45	110 51 41.0
Oct. 19 (3.0)	F.	53.51	38.1
20	P.	53.37	37.4
Mean . . .		5 22 53.443	110 51 38.83
Div., Flex., etc.		. .	− 0.01

B. A. C. 1719.

1875.		h. m. s.	° ′ ″
Jan. 22	Sk.	5 23 4.85	131 3 11.5
Nov. 12	P.	4.77	12.2
Dec. 12	P.	4.88	11.1
Mean . . .		5 23 4.833	131 3 11.60
Div., Flex., etc.		. .	+ 0.37

B. A. C. 1718.

1875.		h. m. s.	° ′ ″
Feb. 5 (7.5)	F.	5 23 11.65	122 31 16.8
16	E.	11.73	15.0
Oct. 21	Sk.	11.89	16.0
Mean . . .		5 23 11.757	122 31 15.93
Div., Flex., etc.		. .	+ 0.24

B. A. C. 1717.

1875.		h. m. s.	° ′ ″
Feb. 9	F.	5 23 23.16	91 11 34.2
13 (4.0)	F.	23.17	35.7
15	Sk.	23.21	33.8
Mean . . .		5 23 23.180	91 11 34.57
Div., Flex., etc.		. .	− 0.02

B. A. C. 1724.

1875.		h. m. s.	° ′ ″
Feb. 4	E.	5 23 56.74	127 20 8.2
Dec. 20	P.	56.93	9.9
22	F.	56.89	8.9
Mean . . .		5 23 56.853	127 20 9.00
Div., Flex., etc.		. .	+ 0.30

B. A. C. 1726.

1875.		h. m. s.	° ′ ″
Feb. 9	F.	5 24 53.06	71 30 3.8
13 (3.5)	F.	53.02	5.3
15	Sk.	53.01	4.5
Mean . . .		5 24 53.030	71 30 4.53
Div., Flex., etc.		. .	− 0.34

B. A. C. 1739.

1875.		h. m. s.	° ′ ″
Jan. 22	Sk.	5 26 46.72	125 33 48.6
Feb. 22 (4.0)	S.	46.78	52.0
Nov. 12	P.	46.51	46.6
Mean . . .		5 26 46.670	125 33 49.07
Div., Flex., etc.		. .	+ 0.23

B. A. C. 1742.

1875.		h. m. s.	° ′ ″
Feb. 13 (2.0)	F.	5 27 . .	66 2 47.1
15	Sk.	49.09	44.5
16	E.	49.10	45.0
17	F.	49.14	45.3
Mean . . .		5 27 49.110	66 2 45.48
Div., Flex., etc.		. .	− 0.16

B. A. C. 1753.

1875.		h. m. s.	° ′ ″
Nov. 12	P.	5 28 39.09	125 13 36.3
Dec. 12	P.	39.14	35.6
20	P.	39.08	38.0
Mean . . .		5 28 39.103	125 13 36.63
Div., Flex., etc.		. .	+ 0.22

B. A. C. 1762^1.

1875.		h. m. s.	° ′ ″
Feb. 11	Sk.	5 29 19.20	95 59 38.3
15	Sk.	19.19	38.3
17	F.	19.15	34.9
Oct. 20	P.	19.10	38.1
Mean . . .		5 29 19.160	95 59 37.40
Div., Flex., etc.		. .	+ 0.07

B. A. C. 1762^2.

1875.		h. m. s.	° ′ ″
Feb. 15	Sk.	5 29 19.66	95 59 47.5
Div., Flex., etc.		. .	+ 0.07

B. A. C. 1767.

1875.		h. m. s.	° ′ ″
Feb. 13 (2.0)	F.	5 30 . .	68 56 10.2
16	E.	10.51	9.7
17	F.	10.50	9.6
Mean . . .		5 30 10.505	68 56 9.83
Div., Flex., etc.		. .	— 0.29

B. A. C. 1771.

1875.		h. m. s.	° ′ ″
Feb. 22 (4.5)	S.	5 30 39.53	123 9 59.3
Oct. 21	Sk.	39.59	55.7
Nov. 12	P.	39.38	56.2
Mean . . .		5 30 39.500	123 9 57.07
Div., Flex., etc.		. .	+ 0.23

B. A. C. 1773.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	5 30 52.13	123 21 17.5
Dec. 12	P.	52.21	15.6
20	P.	52.10	14.6
Mean . . .		5 30 52.147	123 21 15.90
Div., Flex., etc.		. .	+ 0.23

B. A. C. 1792.

1875.		h. m. s.	° ′ ″
Feb. 15	Sk.	5 34 4.31	73 32 0.8
16	E.	4.29	31 59.8
17	F.	4.24	32 1.0
Mean . . .		5 34 4.280	73 32 0.53
Div., Flex., etc.		. .	— 0.39

B. A. C. 1794.

1875.		h. m. s.	° ′ ″
Feb. 11	Sk.	5 34 27.06	92 0 38.1
13	F.	. .	39.7
27	Sk.	27.08	39.4
July 7	E.	27.07	43.5
Mean . . .		5 34 27.070	92 0 40.18
Div., Flex., etc.		. .	— 0.01

B. A. C. 1798.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	5 34 42.82	130 46 46.3
8	E.	42.76	46.2
Oct. 17	Sk.	42.66	42.6
Mean . . .		5 34 42.747	130 46 45.03
Div., Flex., etc.		. .	+ 0.37

B. A. C. 1806.

1875.		h. m. s.	° ′ ″
Feb. 13 (5.0)	F.	5 36 . .	88 35 17.8
15	Sk.	0.76	16.3
16	E.	0.87	16.6
Mean . . .		5 36 0.815	88 35 16.90
Div., Flex., etc.		. .	— 0.03

B. A. C. 1814.

1875.		h. m. s.	° ′ ″
Jan. 14	Sk.	5 37 46.30	124 43 49.9
Feb. 22 (5.0)	S.	46.43	54.4
Mar. 8	E.	46.33	50.3
Mean . . .		5 37 46.353	124 43 51.53
Div., Flex., etc.		. .	+ 0.21

B. A. C. 1825.

1875.		h. m. s.	° ′ ″
Feb. 27	Sk.	5 39 22.56	129 27 50.4
Mar. 4	E.	22.50	52.1
Oct. 17	Sk.	22.52	48.7
Mean . . .		5 39 22.527	129 27 45.04
Div., Flex., etc.		. .	+ 0.34

B. A. C. 1831.

1875.		h. m. s.	° ′ ″
Oct. 20	P.	5 40 8.12	88 52 37.9
21	Sk.	8.22	38.1
Nov. 14	Sk.	8.13	36.6
Mean . . .		5 40 8.157	88 52 37.53
Div., Flex., etc.		. .	— 0.02

B. A. C. 1842.

1875.		h. m. s.	° ′ ″
Feb. 5	F.	5 41 16.66	129 21 53.9
Div., Flex., etc.		. .	+ 0.34

B. A. C. 1841.

1875.		h. m. s.	° ′ ″
Feb. 11	Sk.	5 41 21.21	122 21 19.4
Nov. 12	P.	21.28	19.1
Dec. 20	P.	21.26	18.8
Mean . . .		5 41 21.250	122 21 19.10
Div., Flex., etc.		. .	+ 0.24

B. A. C. 1843.

1875.		h. m. s.	° ′ ″
Feb. 14	Sk.	5 41 49.77	99 42 56.9
Dec. 27	Sk.	49.78	57.5
Mean . . .		5 41 49.775	99 42 57.20
Div., Flex., etc.		. .	— 0.12

B. A. C. 1847.

1875.		h. m. s.	° ′ ″
Mar. 8	E.	5 42 20.35	126 16 43.4
Div., Flex., etc.		. .	+ 0.25

B. A. C. 1845.

1875.		h. m. s.	° ′ ″
Oct. 19 (4.0)	F.	5 42 49.59	50 53 . .
20	P.	49.62	25.4
21	Sk.	49.59	27.4
Nov. 14	Sk.	49.62	27.9
Mean . . .		5 42 49.605	50 53 26.90
Div., Flex., etc.		. .	— 0.37

B. A. C. 1859.

1875.		h. m. s.	° ′ ″
Feb. 15	Sk.	5 43 45.81	123 28 24.2
16	E.	45.97	22.5
27	Sk.	45.85	23.0
Mean . . .		5 43 45.877	123 28 23.23
Div., Flex., etc.		. .	+ 0.23

WEISSE 1110.

1875.		h. m. s.	° ′ ″
Oct. 20 (7.0)	P.	5 44 56.63	75 37 48.8
Div., Flex., etc.		. .	— 0.35

B. A. C. 1865.

1875.		h. m. s.	° ′ ″
Feb. 22 (7.0)	S.	5 45 8.95	120 39 33.5
Div., Flex., etc.		. .	+ 0.25

B. A. C. 1862.

1875.		h. m. s.	° ′ ″
Dec. 20	P.	5 45 16.24	75 51 44.8
22	F.	16.28	44.9
27	Sk.	16.26	42.6
Mean . . .		5 45 16.260	75 51 44.10
Div., Flex., etc.		. .	— 0.35

B. A. C. 1878.

1875.		h. m. s.	° ′ ″
Feb. 5 (2.0)	F.	5 46 33.14	125 48 59.9
15	Sk.	33.17	48 59.8
16	E.	33.26	49 0.6
Mean . . .		5 46 33.190	125 49 0.10
Div., Flex., etc.		. .	+ 0.23

B. A. C. 1889.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	5 48 17.61	127 39 35.9
Div., Flex., etc.		. .	+ 0.30

B. A. C. 1891.

1875.		h. m. s.	° ′ ″
Mar. 8	E.	5 48 34.69	123 49 50.6
Dec. 27	Sk.	34.65	49.0
Mean . . .		5 48 34.670	123 49 49.80
Div., Flex., etc.		. .	+ 0.22

B. A. C. 1892.

1875.		h. m. s.	° ′ ″
Feb. 12	E.	5 48 36.49	128 33 16.3
Div., Flex., etc.		. .	+ 0.32

B. A. C. 1882.

1875.		h. m. s.	° ′ ″
Oct. 21	Sk.	5 48 37.43	61 4 49.6
Nov. 12	P.	37.37	48.0
Dec. 20	P.	37.33	49.0
Mean . . .		5 48 37.377	61 4 48.87
Div., Flex., etc.		. .	— 0.07

B. A. C. 1896.

1875.		h. m. s.	° ′ ″
Nov. 14	Sk.	5 50 14.28	64 3 49.3
Dec. 20	P.	14.23	50.8
22	F.	14.22	49.7
Mean . . .		5 50 14.243	64 3 49.93
Div., Flex., etc.		. .	— 0.12

B. A. C. 1904.

1875.			h. m. s.	° ′ ″
Feb.	15	Sk.	5 50 48.45	129 58 51.2
	22 (6.0)	S.	48.62	52.9
Dec.	27	Sk.	48.39	49.1
Mean . . .			5 50 48.487	129 58 51.07
Div., Flex., etc.			. .	+ 0.36

B. A. C. 1900.

1875.			h. m. s.	° ′ ″
Feb.	27	Sk.	5 51 11.76	52 47 57.4
Mar.	8	E.	11.78	56.3
Oct.	19	F.	. .	54.5
Dec.	13	E.	11.81	56.6
Mean . . .			5 51 11.783	52 47 56.20
Div., Flex., etc.			. .	− 0.17

B. A. C. 1910.

1875.			h. m. s.	° ′ ″
Feb.	5 (7.0)	F.	5 51 38.74	121 24 5.1
	12	E.	38.69	3.0
	15	Sk.	38.69	5.1
Mean . . .			5 51 38.707	121 24 4.40
Div., Flex., etc.			. .	+ 0.25

B. A. C. 1907.

1875.			h. m. s.	° ′ ″
Feb.	26	S.	5 51 51.18	77 12 22.5
Oct.	20	P.	51.21	22.4
Nov.	14	Sk.	51.26	21.7
Mean . . .			5 51 51.217	77 12 22.20
Div., Flex., etc.			. .	− 0.34

B. A. C. 1922.

1875.			h. m. s.	° ′ ″
Jan.	14	Sk.	5 53 6.41	125 17 54.3
Feb.	11	Sk.	6.39	52.7
	16	E.	6.34	52.8
Mean . . .			5 53 6.380	125 17 53.27
Div., Flex., etc.			. .	+ 0.22

B. A. C. 1925.

1875.			h. m. s.	° ′ ″
Nov.	12	P.	5 54 8.71	67 36 17.6
Dec.	12	P.	8.75	17.8
	20	P.	8.72	18.0
Mean . . .			5 54 8.727	67 36 17.80
Div., Flex., etc.			. .	− 0.22

B. A. C. 1930.

1875.			h. m. s.	° ′ ″
Oct.	20 (8.0)	P.	5 55 39.92	72 20 9.4
Nov.	12	P.	39.90	10.4
Dec.	12	P.	39.94	10.5
Mean . . .			5 55 39.920	72 20 10.10
Div., Flex., etc.			. .	− 0.35

B. A. C. 1938.

1875.			h. m. s.	° ′ ″
Feb.	26	S.	5 56 31.20	66 43 57.2
	27	Sk.	31.20	57.1
Mar.	4	E.	31.28	57.9
	8	E.	31.33	58.2
Mean . . .			5 56 31.252	66 43 57.60
Div., Flex., etc.			. .	− 0.17

B. A. C. 1976.

1875.			h. m. s.	° ′ ″
Jan.	14	Sk.	6 2 33.63	124 17 50.7
Feb.	4	E.	33.43	51.1
	5 (6.5)	F.	33.55	52.6
	26	S.	33.58	53.4
Mean . . .			6 2 33.548	124 17 51.95
Div., Flex., etc.			. .	+ 0.22

B. A. C. 1982.

1875.			h. m. s.	° ′ ″
Feb.	11	Sk.	6 3 14.48	127 14 12.7
	12	E.	14.51	14.2
	15	Sk.	14.57	11.3
	26	S.	14.54	13.8
Mean . . .			6 3 14.525	127 14 13.00
Div., Flex., etc.			. .	+ 0.29

B. A. C. 1989.

1875.			h. m. s.	° ′ ″
Oct.	19 (6.5)	F.	6 4 50.74	73 50 36.3
	20	P.	50.84	36.2
	21	Sk.	50.81	37.9
Nov.	12	P.	50.75	36.6
Mean . . .			6 4 50.785	73 50 36.75
Div., Flex., etc.			. .	− 0.40

B. A. C. 1996.

1875.			h. m. s.	° ′ ″
Feb.	11	Sk.	6 6 4.07	124 47 29.5
	15	Sk.	4.05	31.2
	27	Sk.	3.91	32.2
Mean . . .			6 6 4.010	124 47 30.97
Div., Flex., etc.			. .	+ 0 21

B. A. C. 1998.

1875.			h. m. s.	° ′ ″
Feb.	5	F.	6 6 8.34	130 19 56.5
	22	S.	8.56	57.2
Mar.	8	E.	8.44	56.6
Mean . . .			6 6 8.447	130 19 56.77
Div.. Flex., etc.			. .	+ 0.36

B. A. C. 2012.

1875.			h. m. s.	° ′ ″
Feb.	26	S.	6 8 43.70	77 24 43.3
	27	Sk.	43.63	43.5
Mar.	13 (5.0)	F.	43.69	44.3
Mean . . .			6 8 43.673	77 24 43.70
Div., Flex., etc.			. .	− 0.34

B. A. C. 2016.

1875.			h. m. s.	° ′ ″
Oct.	19 (7.0)	F.	6 9 21.20	66 13 8.9
	20	P.	21.16	8.2
	21	Sk.	21.13	. .
Nov.	12	P.	21.18	8.0
	14	Sk.	21.19	9.0
Dec.	22	F.	21.07	12.9
Mean . . .			6 9 21.155	66 13 9.40
Div., Flex., etc.			. .	− 0.16

B. A. C. 2035.

1875.			h. m. s.	° ′ ″
Feb.	22	S.	6 12 27.92	129 13 13.5
Oct.	20	P.	27.77	9.1
Dec.	12	P.	27.91	11.4
Mean . . .			6 12 27.867	129 13 11.33
Div., Flex., etc.			. .	+ 0.34

B. A. C. 2051.

1875.			h. m. s.	° ′ ″
Oct.	20	P.	6 15 30.92	120 0 31.3
Dec.	12	P.	30.92	31.3
	27	Sk.	30.87	32.0
Mean . . .			6 15 30.903	120 0 31.53
Div., Flex., etc.			. .	+ 0.24

B. A. C. 2061.

1875.			h. m. s.	° ′ ″
Feb.	22	S.	6 17 11.83	107 53 44.5
May	17	F.	11.82	42.5
Mean . . .			6 17 11.825	107 53 43.50
Div., Flex., etc.			. .	− 0.07

B. A. C. 2066.

1875.			h. m. s.	° ′ ″
Feb.	16	E.	6 17 32.70	123 22 29.8
Div., Flex., etc.			. .	+ 0.23

B. A. C. 2063.

1875.			h. m. s.	° ′ ″
Dec.	12	P.	6 17 56.21	66 29 29.6
	13	E.	56.22	30.7
	20	P.	56.14	30.2
Mean . . .			6 17 56.190	66 29 30.17
Div., Flex., etc.			. .	− 0.17

B. A. C. 2064.

1875.			h. m. s.	° ′ ″
Feb.	26	S.	6 17 57.05	66 36 23.5
Mar.	13 (5.5)	F.	57.05	24.1
Oct.	19 (7.5)	F.	57.03	23.0
Mean . . .			6 17 57.043	66 36 23.53
Div., Flex., etc.			. .	− 0.17

B. A. C. 2072.

1875.			h. m. s.	° ′ ″
Mar.	4	E.	6 18 31.51	120 52 58.1
Div., Flex., etc.			. .	+ 0.25

B. A. C. 2073.

1875.			h. m. s.	° ′ ″
Feb.	15	Sk.	6 18 33.83	121 43 37.6
Div., Flex., etc.			. .	+ 0.25

B. A. C. 2077.

1875.			h. m. s.	° ′ ″
Feb.	5 (8.0)	F.	6 19 26.46	126 56 59.7
	17	F.	26.38	55.2
Mean . . .			6 19 26.420	126 56 57.45
Div., Flex., etc.			. .	+ 0.29

B. A. C. 2079.

1875.			h. m. s.	° ′ ″
Feb.	4	E.	6 19 40.88	126 38 39.3
Div., Flex., etc.			. .	+ 0.27

BRISBANE 1230.

1875.			h. m. s.	° ′ ″
Feb.	4	E.	6 19 46.14	126 38 9.9
Div., Flex., etc.			. .	+ 0.27

B. A. C. 2089.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	6 20 41.16	130 12 52.6
Mar. 8 E.	41.22	56.0
Oct. 20 P.	41.07	52.6
Mean . . .	6 20 41.150	130 12 53.73
Div., Flex., etc.	. .	+ 0.36

B. A. C. 2098.

1875.	h. m. s.	° ′ ″
Feb. 11 Sk.	6 21 46.37	130 54 5.4
22 (8.0) S.	46.58	13.6
27 (8.8) Sk.	46.42	8.2
Mean . . .	6 21 46.457	130 54 9.07
Div., Flex., etc.	. .	+ 0.37

B. A. C. 2109.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	6 23 32.19	122 30 11.2
26 (5.5) S.	32.19	12.3
Mar. 4 E.	32.26	11.6
Mean . . .	6 23 32.213	122 30 11.70
Div., Flex., etc.	. .	+ 0.24

B. A. C. 2112.

1875.	h. m. s.	° ′ ″
Feb. 16 E.	6 24 0.12	122 17 31.5
Mar. 13 (6.0) F.	0.29	32.3
Dec. 20 P.	0.11	31.8
Mean . . .	6 24 0.173	122 17 31.87
Div., Flex., etc.	. .	+ 0.24

B. A. C. 2117.

1875.	h. m. s.	° ′ ″
Feb. 13 F.	6 24 42.41	130 59 39.9
Div., Flex., etc.	. .	+ 0.37

B. A. C. 2122.

1875.	h. m. s.	° ′ ″
Feb. 5 F.	6 25 3.43	130 17 29.8
Div., Flex., etc.	. .	+ 0.36

BRISBANE 1256.

1875.	h. m. s.	° ′ ″
Feb. 5 F.	6 25 9.02	130 18±

B. A. C. 2135.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	6 26 37.63	130 22 6.5
22 S	37.76	6.8
Dec. 12 P.	37.76	5.3
Mean . . .	6 26 37.717	130 22 6.20
Div., Flex., etc.	. .	+ 0.36

B. A. C. 2136.

1875.	h. m. s.	° ′ ″
Feb. 17 (4.0) F.	6 26 45.90	125 10 17.6
Div., Flex., etc.	. .	+ 0.22

B. A. C. 2138.

1875.	h. m. s.	° ′ ″
Feb. 26 (8.0) S.	6 26 59.35	130 49 47.4
Div., Flex., etc.	. .	+ 0.37

B. A. C. 2141.

1875.	h. m. s.	° ′ ″
Feb. 16 E.	6 27 15.19	126 51 13.6
Div., Flex., etc.	. .	+ 0.28

B. A. C. 2134.

1875.	h. m. s.	° ′ ″
Mar. 4 E.	6 27 16.67	70 28 39.6
13 (7.5) F.	16.61	37.5
Oct. 19 F.	16.65	37.3
Mean . . .	6 27 16.643	70 28 38.13
Div., Flex., etc.	. .	− 0.32

B. A. C. 2158.

1875.	h. m. s.	° ′ ″
Feb. 13 F.	6 29 26.61	126 8 23.3
Dec. 12 P.	26.60	21.8
20 P.	26.45	24.3
Mean . . .	6 29 26.553	126 8 23.13
Div., Flex., etc.	. .	+ 0.25

B. A. C. 2162.

1875.	h. m. s.	° ′ ″
Feb. 11 Sk.	6 29 57.33	122 37 6.9
Div., Flex., etc.	. .	+ 0.24

B. A. C. 2164.

1875.	h. m. s.	° ′ ″
Feb. 16 E.	6 30 10.76	123 54 . .
Dec. 20 P.	10.69	44.8
Mean . . .	6 30 10.725	123 54 44.80
Div., Flex., etc.	. .	+ 0.22

LALANDE 12661.

1875.	h. m. s.	° ′ ″
Oct. 20 P.	6 30 27.36	60 54 39.0
21 Sk.	27.29	40.0
Nov. 14 Sk.	27.34	39.3
Mean . . .	6 30 27.330	60 54 39.43
Div., Flex., etc.	. .	− 0.07

B. A. C. 2179.

1875.	h. m. s.	° ′ ″
Mar. 13 (6.0) F.	6 32 47.34	128 2 34.2
Div., Flex., etc.	. .	+ 0.31

B. A. C. 2183.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	6 33 6.74	122 14 5.5
17 F.	6.64	5.0
Dec. 12 P.	6.81	5.2
Mean . . .	6 33 6.730	122 14 5.23
Div., Flex., etc.	. .	+ 0.25

B. A. C. 2184.

1875.	h. m. s.	° ′ ″
Mar. 4 E.	6 34 9.23	73 29 20.0
8 E.	9.18	18.6
Oct. 19 (7.5) F.	9.24	16.5
Mean . . .	6 34 9.217	73 29 18.37
Div., Flex., etc.	. .	− 0.38

B. A. C. 2190.

1875.	h. m. s.	° ′ ″
Feb. 4 E.	6 34 23.89	127 53 8.7
13 F.	24.02	4.5
26 S.	24.18	6.9
Mean . . .	6 34 24.030	127 53 6.70
Div., Flex., etc.	. .	+ 0.31

B. A. C. 2195.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	6 35 41.38	128 2 36.5
16 E.	41.52	39.6
Dec. 12 P.	41.48	37.1
Mean . . .	6 35 41.460	128 2 37.73
Div., Flex., etc.	. .	+ 0.31

B. A. C. 2194.

1875.	h. m. s.	° ′ ″
Feb. 12 E.	6 36 14.42	64 44 50.8
17 (2.0) F.	14.37	51.7
Aug. 8 P.	14.43	50.4
Oct. 20 P.	14.40	50.2
Dec. 13 E.	14.44	51.4
Mean . . .	6 36 14.412	64 44 50.90
Div., Flex., etc.	. .	− 0.14

B. A. C. 2202.

1875.	h. m. s	° ′ ″
Feb. 11 Sk.	6 37 9.76	130 13 54.5
Oct. 17 (8.0) Sk.	9.65	53.1
Dec. 12 P.	9.62	55.7
Mean . . .	6 37 9.677	130 13 54.43
Div., Flex., etc.	. .	+ 0.36

B. A. C. 2214.

1875.	h. m. s.	° ′ ″
Oct. 17 (6.5) Sk.	6 39 43.17	120 56 41.4
20 P.	43.14	36.9
Mean . . .	6 39 43.155	120 56 39.15
Div., Flex., etc.	. .	+ 0.25

B. A. C. 2228.

1875.	h. m. s.	° ′ ″
Mar. 13 (5.0) F.	6 42 38.08	73 39 28.0
16 E.	38.07	27.5
Oct. 19 (7.0) F.	38.11	26.7
Mean . . .	6 42 38.087	73 39 27.40
Div., Flex., etc.	. .	− 0.39

B. A. C. 2231.

1875.	h. m. s.	° ′ ″
Dec. 12 P.	6 43 4.85	127 47 36.3
Div., Flex., etc.	. .	+ 0.31

B. A. C. 2238.

1875.	h. m. s.	° ′ ″
Oct. 20 P.	6 44 24.65	66 15 10.5
21 Sk.	24.62	10.3
Nov. 14 Sk.	24.63	9.5
Mean . . .	6 44 24.633	66 15 10.10
Div., Flex., etc.	. .	− 0.17

B. A. C. 2246.

1875.	h. m. s.	° ′ ″
Dec. 12 P.	6 45 10.35	122 22 0.9
Div., Flex., etc.	. .	+ 0.24

B. A. C. 2252.

1875.		h. m. s.	° ′ ″
Feb. 13 (5.0)	F.	6 46 19.66	124 13 17.9
Oct. 17 (6.0)	Sk.	19.57	16.8
Mean . . .		6 46 19.615	124 13 17.35
Div., Flex., etc.		. .	+ 0.22

B. A. C. 2258.

1875.		h. m. s.	° ′ ″
Oct. 17 (7.5)	Sk.	6 47 17.92	126 4 45.2
Div., Flex., etc.		. .	+ 0.24

B. A. C. 2255.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	6 47 35.52	76 39 58.0
8	E.	35.60	55.6
16	E.	35.50	58.0
Mean . . .		6 47 35.540	76 39 57.20
Div., Flex., etc.		. .	− 0.33

B. A. C. 2282.

1875.		h. m. s.	° ′ ″
Feb. 4	E.	6 52 16.34	125 10 42.2
5 (6.0)	F.	16.43	41.5
13	F.	16.48	40.2
Mean . . .		6 52 16.417	125 10 41.30
Div., Flex., etc.		. .	+ 0.22

B. A. C. 2288.

1875.		h. m. s.	° ′ ″
Mar. 8	E.	6 52 49.33	125 20 34.1
13 (6.0)	F.	49.37	. .
Dec. 20	P.	49.21	38.5
Mean . . .		6 52 49.303	125 20 36.30
Div., Flex., etc.		. .	+ 0.22

B. A. C. 2285.

1875.		h. m. s.	° ′ ″
Oct. 21	Sk.	6 53 4.89	73 45 2.4
Nov. 14	Sk.	4.73	1.3
Dec. 12	P.	4.81	1.7
Mean . . .		6 53 4.810	73 45 1.80
Div., Flex., etc.		. .	− 0.39

B. A. C. 2309.

1875.		h. m. s.	° ′ ″
Dec. 12	P.	6 56 44.40	117 45 23.9
20	P.	44.30	25.8
27	Sk.	44.26	23.9
Mean . . .		6 56 44.320	117 45 24.53
Div., Flex., etc.		. .	+ 0.22

B. A. C. 2313.

1875.		h. m. s.	° ′ ″
Feb. 27	Sk.	6 57 46.73	67 10 41.5
Mar. 13 (5.0)	F.	46.72	40.1
Oct. 21	Sk.	46.80	40.1
Nov. 12	P.	46.83	39.2
Mean . . .		6 57 46.770	67 10 40.22
Div., Flex., etc.		. .	− 0.19

LALANDE 13681.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	6 58 20.09	61 37 20.0
8	E.	20.16	24.5
Mean . . .		6 58 20.125	61 37 22.25
Div., Flex., etc.		. .	− 0.06

B. A. C. 2322.

1875.		h. m. s.	° ′ ″
Nov. 12	P.	6 58 48.31	80 37 36.9
14	Sk.	48.32	36.6
Dec. 12	P.	48.30	37.5
Mean . . .		6 58 48.310	80 37 37.00
Div., Flex., etc.		. .	− 0.39

LALANDE 13700.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	6 58 54.12	61 35 50.9
8	E.	54.27	47.5
Mean . . .		6 58 54.195	61 35 49.20
Div., Flex., etc.		. .	− 0.06

LALANDE 13724.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	6 59 34.27	61 38 2.5
8	E.	34.45	0.6
Mean . . .		6 59 34.360	61 38 1.55
Div., Flex., etc.		. .	− 0.06

LALANDE 13757.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	7 0 28.87	61 35 44.3
8	E.	29.00	42.4
Mean . . .		7 0 28.935	61 35 43.35
Div., Flex., etc.		. .	− 0.06

B. A. C. 2335.

1875.		h. m. s.	° ′ ″
Feb. 13	F.	7 1 44.82	128 11 31.06
Div., Flex., etc.		. .	+ 0.31

B. A. C. 2340.

1875.		h. m. s.	° ′ ″
Nov. 14	Sk.	7 3 10.86	59 33 4.5
Dec. 12	P.	10.84	7.9
20	P.	10.92	7.9
Mean . . .		7 3 10.873	59 33 6.77
Div., Flex, etc.		. .	− 0.10

47 GEMINORUM.

1875.		h. m. s.	° ′ ″
Oct. 21	Sk.	7 3 37.83	62 56 24.2
Dec. 22	F.	37.85	23.4
27	Sk.	37.81	24.6
Mean . . .		7 3 37.830	62 56 24.07
Div., Flex., etc.		. .	− 0.09

DURCH. 28°, 1331.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	7 3 51.28	61 36 25.4
8	E.	51.31	26.4
Mean . . .		7 3 51.295	61 36 25.90
Div., Flex., etc.		. .	− 0.06

LALANDE 13905.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	7 4 34.80	61 35 0.6
8	E.	34.87	0.4
Mean . . .		7 4 34.835	61 35 0.50
Div., Flex., etc.		. .	− 0.06

B. A. C. 2355.

1875.		h. m. s.	° ′ ″
Oct. 17	Sk.	7 4 39.24	129 27 22.1
Dec. 12	P.	39.21	23.2
27	Sk.	39.16	19.2
Mean . . .		7 4 39.203	129 27 21.50
Div., Flex., etc.		. .	+ 0.34

B. A. C. 2364.

1875.		h. m. s.	° ′ ″
Feb. 27	Sk.	7 7 3.16	64 54 0.3
Mar. 13	F.	3.17	0.9
Oct. 21	Sk.	3.17	54 2.1
Nov. 12	P.	3.18	53 59.2
14	Sk.	3.15	59.9
Mean . . .		7 7 3.166	64 54 0.48
Div., Flex., etc.		. .	+ 0.15

B. A. C. 2385.

1875.		h. m. s.	° ′ ″
Feb. 16	E.	7 8 58.62	120 52 13.9
Div., Flex., etc.		. .	+ 0.25

B. A. C. 2398.

1875.		h. m. s.	° ′ ″
Oct. 21	Sk.	7 10 54.50	73 14 12.0
Nov. 14	Sk.	54.44	10.7
Dec. 12	P.	54.47	10.3
Mean . . .		7 10 54.470	73 14 11.00
Div., Flex., etc.		. .	− 0.38

B. A. C. 2422.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	7 13 51.78	126 30 20.2
Oct. 17	Sk.	51.74	27.9
Dec. 12	P.	51,68	26.1
27	Sk.	51.64	25.3
Mean . . .		7 13 51.710	126 30 27.38
Div., Flex., etc.		. .	+ 0.27

B. A. C. 2425.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	7 14 11.58	126 30 57.6
Oct. 17	Sk.	11.58	53.6
Dec. 12	P.	11.47	55.5
27	Sk.	11.48	54.1
Mean . . .		7 14 11.528	126 30 55.20
Div., Flex., etc.		. .	+ 0.27

B. A. C. 2434.

1875.		h. m. s.	° ′ ″
Oct. 21	Sk.	7 15 57.40	66 48 59.8
Nov. 14	Sk.	57.38	59.6
Dec. 12	P.	57.41	57.6
20	P.	57.41	59.4
Mean . . .		7 15 57.400	66 48 59.10
Div., Flex., etc.		. .	− 0.18

B. A. C. 2446.

1875.		h. m. s.	° ′ ″
Feb. 16	E.	7 17 49.42	121 48 29.2
Div., Flex., etc.		. .	+ 0.25

B. A. C. 2444.

1875.		h. m. s.	° ′ ″
Mar. 4	E.	7 18 . .	78 5 16.8
8	E.	1.47	17.1
Oct. 20	P.	1.49	15.7
Nov. 12	P.	1.56	15.9
Mean . . .		7 18 1.507	78 5 16.38
Div., Flex., etc.		. .	− 0.38

B. A. C. 2456.

1875.	h. m. s.	° ′
Feb. 11 Sk.	7 19 1.28	119 58

B. A. C. 2462.

1875.	h. m. s.	° ′ ″
Mar. 13 (2.5) F.	7 20 22.22	81 27 39.9
Oct. 20 P.	22.19	39.1
21 Sk.	22.23	40.3
Mean . . .	7 20 22.213	81 27 39.77
Div., Flex., etc.	. .	— 0.36

B. A. C. 2469.

1875.	h. m. s.	° ′ ″
Nov. 14 Sk.	7 22 2.08	61 49 41.3
Dec. 12 P.	2.12	40.1
20 P.	2.10	. .
27 Sk.	2.00	41.6
Mean . . .	7 22 2.075	61 49 41.00
Div., Flex., etc.	. .	— 0.06

B. A. C. 2471.

1875.	h. m. s.	° ′ ″
Mar. 17 F.	7 22 3.75	123 53 27.7
Div., Flex., etc.	. .	+ 0.22

B. A. C. 2477^1.

1875.	h. m. s.	° ′ ″
Mar. 8 E.	7 24 3.15	121 35 34.6
Dec. 12 P.	3.06	30.2
20 P.	3.08	33.4
Mean . . .	7 24 3.097	121 35 32.72
Div., Flex., etc.	. .	+ 0.25

B. A. C. 2477^2.

1875.	h. m. s.	° ′ ″
Mar. 8 E.	7 24 3.83	121 35 27.8
Dec. 12 P.	3.68	23.9
20 P.	3.65	27.4
Mean . . .	7 24 3.720	121 35 26.37
Div., Flex., etc.	. .	+ 0.25

B. A. C. 2493.

1875.	h. m. s.	° ′ ″
Mar. 4 E.	7 28 12.99	62 49 43.5
13 F.	12.98	41.1
Oct. 19 F.	13.04	41.2
Mean . . .	7 28 13.003	62 49 41.93
Div., Flex., etc.	. .	— 0.08

B. A. C. 2506.

1875.	h. m. s.	° ′ ″
Mar. 13 (7.5) F.	7 30 40.30	65 21 40.7
Oct. 19 F.	40.45	41.2
Dec. 12 P.	40.37	40.7
Mean . . .	7 30 40.373	65 21 40.87
Div., Flex., etc.	. .	— 0.15

B. A. C. 2523.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	7 32 44.47	124 41 17.3
Div., Flex., etc.	. .	+ 0.21

B. A. C. 2543.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	7 35 3.06	128 1 20.7
Dec. 12 P.	3.12	20.8
Mean . . .	7 35 3.090	128 1 20.75
Div., Flex., etc.	. .	+ 0.31

B. A. C. 2546.

1875.	h. m. s.	° ′ ″
Dec. 12 P.	7 35 23.24	127 58 24.0
Div., Flex., etc.	. .	+ 0.31

ANONYMOUS.

1875.	h. m. s.	° ′ ″
Dec. 22 F.	7 37 40.00	70 20 36.8
Div., Flex., etc.	. .	— 0.32

B. A. C. 2561.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	7 38 37.57	125 45 15 5
Div., Flex., etc.	. .	+ 0.23

B. A. C. 2564.

1875.	h. m. s.	° ′ ″
Mar. 13 (6.5) F.	7 39 23.27	78 55 43.8
Oct. 21 Sk.	23.33	44.3
Nov. 14 Sk.	23.31	42.3
Mean . . .	7 39 23.303	78 55 43.47
Div., Flex., etc.	. .	— 0.39

B. A. C. 2575.

1875.	h. m. s.	° ′ ″
Mar. 8 E.	7 40 7.28	127 38 36.3
Div., Flex., etc.	. .	+ 0.30

LACAILLE 2956.

1875.	h. m. s.	° ′ ″
Mar. 8 (8.0) E.	7 40 37.40	127 35 13.0
Div., Flex., etc.	. .	+ 0.30

B. A. C. 2580.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	7 40 48.14	127 39 57.2
Mar. 4 E.	48.14	40 2.0
8 (4.0) E.	48.16	3.9
Mean . . .	7 40 48.147	127 40 1.03
Div., Flex., etc.	. .	+ 0.30

B. A. C. 2588.

1875.	h. m. s.	° ′ ″
Mar. 4 E.	7 41 43.11	127 37 49.1
8 E.	43.21	47.9
Mean . . .	7 41 43.160	127 37 48.50
Div., Flex., etc.	. .	+ 0.30

B. A. C. 2595.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	7 42 59.54	128 12 10.6
Div., Flex., etc.	. .	+ 0.31

B. A. C. 2592.

1875.	h. m. s.	° ′ ″
Mar. 12 E.	7 42 59.92	56 27 11.3
13 (7.0) F.	43 0.04	12.7
Oct. 20 P.	42 59.96	11.5
Mean . . .	7 42 59.973	56 27 11.83
Div., Flex., etc.	. .	+ 0.06

B. A. C. 2604.

1875.	h. m. s.	° ′ ″
Feb. 5 (6.0) F.	7 43 52.24	130 20 28.0
Div., Flex., etc.	. .	+ 0.36

B. A. C. 2605.

1875.	h. m. s.	° ′ ″
Nov. 14 Sk.	7 44 40.40	70 21 25.8
Dec. 27 Sk.	40.43	24.3
Mean . . .	7 44 40.415	70 21 25.05
Div., Flex., etc.	. .	— 0.32

B. A. C. 2629.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	7 47 35.55	124 23 34.4
Div., Flex., etc.	. .	+ 0.22

B. A. C. 2635.

1875.	h. m. s.	° ′ ″
Feb. 11 Sk.	7 48 13.29	128 32 28.1
Div., Flex., etc.	. .	+ 0.32

B. A. C. 2632.

1875.	h. m. s.	° ′ ″
Oct. 20 P.	7 48 22.10	69 47 16.3
Nov. 14 Sk.	22.10	17.1
Dec. 20 P.	22.09	19.1
Mean . . .	7 48 22.097	69 47 17.50
Div., Flex., etc.	. .	— 0.31

B. A. C. 2646.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	7 49 58.02	124 31 7.4
Mar. 4 E.	57.96	11.4
Mean . . .	7 49 57.990	124 31 9.40
Div., Flex., etc.	. .	+ 0.21

B. A. C. 2653.

1875.	h. m. s.	° ′ ″
Mar. 8 E.	7 51 51.80	87 26 38.7
13 (5.5) F.	51.67	36.4
Oct. 19 F.	51.76	36.7
Mean . . .	7 51 51.743	87 26 37.27
Div., Flex., etc.	. .	— 0.06

B. A. C. 2655.

1875.	h. m. s.	° ′ ″
Feb. 15 Sk.	7 52 41.25	119 59 57.1
Div., Flex., etc.	. .	+ 0.24

ω′ CANCRI.

1875.	h. m. s.	° ′ ″
Oct. 21 Sk.	7 53 21.84	64 16 2.3
Dec. 20 P.	22.00	1.9
22 F.	21.88	1.7
Mean . . .	7 53 21.907	64 16 1.97
Div., Flex., etc.	. .	— 0.13

B. A. C. 2659.

1875.			h. m. s.	° ' "
Oct.	19	F.	7 53 37.36	72 21 2.5
Nov.	24	Sk.	37.41	2.2
Dec.	12	P.	37.39	2.3
Mean . . .			7 53 37.387	72 21 2.33
Div., Flex., etc.			. .	— 0.35

B. A. C 2671.

1875.			h. m. s.	° ' "
Feb.	11	Sk.	7 55 3.82	128 57 17.8
	15	Sk.	3.63	19.6
Mean . . .			7 55 3.725	128 57 18.70
Div., Flex., etc.			. .	+ 0.33

B. A. C. 2676.

1875.			h. m. s.	° ' "
Mar.	8	E.	7 56 27.63	67 34 52.3
	12	E.	27.51	51.4
	13 (7.0)	F.	27.50	50.8
Mean . . .			7 56 27.547	67 34 51.50
Div., Flex., etc.			. .	— 0.21

B. A. C. 2690.

1875.			h. m. s.	° ' "
Mar.	8	E.	7 58 6.62	76 31 40.2
	12	E.	6.57	39.4
	13	F.	6.58	38.3
Mean . . .			7 58 6.590	76 31 39.30
Div., Flex., etc.			. .	— 0.33

B. A. C. 2699[1].

1875.			h. m. s.	° ' "
Feb.	15	Sk.	7 58 11.52	122 6 51.1
Div., Flex , etc.			. .	+ 0.25

B. A. C. 2717.

1875.			h. m. s.	° ' "
Feb.	11	Sk.	8 0 14.35	123 14 12.5
Div., Flex., etc.			. .	+ 0.23

B. A. C. 2720.

1875.			h. m. s.	° ' "
April	5	E.	8 1 43.22	75 59 48.9
Oct.	19	F.	43.20	49.3
	21	Sk.	43.20	50.6
Mean . . .			8 1 43.207	75 59 49.60
Div., Flex., etc.			. .	— 0.34

LALANDE 15898.

1875.			h. m. s.	° ' "
Dec.	12	P.	8 2 9.55	64 4 38.2
	20 (7.0)	P.	9.53	36.0
	22	F.	9.48	36.5
Mean . . .			8 2 9.520	64 4 36.90
Div., Flex., etc.			. .	— 0.12

B. A. C. 2730.

1875.			h. m. s.	° ' "
Oct.	21	Sk.	8 2 55.16	64 6 55.8
Nov.	14	Sk.	55.25	55.6
Dec.	12	P.	55.28	55.0
Mean . . .			8 2 55.230	64 6 55.47
Div., Flex., etc.			. .	— 0.12

B. A. C. 2735.

1875.			h. m. s.	° ' "
Feb.	15	Sk.	8 3 16.18	124 50 51.8
Div., Flex., etc.			. .	+ 0.21

B. A. C. 2758.

1875.			h. m. s.	° ' "
Feb.	15	Sk.	8 6 24.66	126 55 18.7
Mar.	8	E.	24.74	20.4
Mean . . .			8 6 24.700	126 55 19.55
Div., Flex., etc.			. .	+ 0.29

B. A. C. 2772.

1875.			h m. s.	° ' "
April	5	E.	8 7 48.82	126 36 54.2
Div., Flex., etc.			. . .	+ 0.27

B. A. C. 2774.

1875.			h. m. s.	° ' "
Mar.	10	F.	8 8.8 . .	125 31 25.3
Div., Flex., etc.			. .	+ 0.23

B. A. C. 2775.

1875.			h. m. s.	° ' "
Feb.	15	Sk.	8 9 14.53	121 45 47.0
Div., Flex., etc.			. .	+ 0.25

B. A. C. 2788.

1875.			h. m. s.	° ' "
Oct.	19	F.	8 13 3.48	68 51 35.9
	21	Sk.	3.40	36.3
Nov.	14	Sk.	3.44	35.0
Mean . . .			8 13 3.440	68 51 35.73
Div., Flex., etc.			. .	— 0.28

O. Arg. N. 8887.

1875.			h. m. s.	° ' "
Mar.	8	E.	8 14 19.31	38 55 15.8
Div., Flex., etc.			. .	— 0.96

B. A. C. 2799.

1875.			h. m. s.	° ' "
April	5	E.	8 16 12.32	71 16 4.9
Oct.	19	F.	12.36	4.7
	21	Sk.	12.27	3.9
Mean . . .			8 16 12.317	71 16 4.50
Div., Flex., etc.			. .	— 0.33

B. A. C. 2805.

1875.			h. m. s.	° ' "
Feb.	15	Sk.	8 16 37.83	126 5 13.9
Mar.	10	F.	37.87	17.7
Dec.	12	P.	37.84	14.7
	20	P.	37.66	12.2
Mean . . .			8 16 37.800	126 5 14.62
Div., Flex., etc.			. .	+ 0.24

B. A. C. 2820.

1875.			h. m. s.	° ' "
Feb.	15	Sk.	8 18 39.78	127 53 5.4
Dec.	20	P.	39.71	5.2
Mean . . .			8 18 39.745	127 53 5.30
Div., Flex., etc.			. .	+ 0.31

O. Arg. N. 9001.

1875.			h. m. s.	° ' "
Mar.	8	E.	8 20 35.79	38 55 19.9
Div., Flex., etc.			. .	— 0.96

O. Arg. N. 9029.

1875.			h. m. s.	° ' "
Mar.	8	E.	8 21 34.70	38 52 30.1
Div., Flex., etc.			. .	— 0.96

O. Arg. N. 9058.

1875.			h. m. s.	° ' "
Mar.	8	E.	8 23 46.99	38 54 55.6
Div., Flex., etc.			. .	— 0.96

B. A. C. 2877.

1875.			h. m. s.	° ' "
April	5	E.	8 26 47.90	128 38 36.9
Div., Flex., etc.			. .	+ 0.32

O. Arg. N. 9125.

1875.			h. m. s.	° ' "
Mar.	8	E.	8 29 42.42	38 54 9.2
Div., Flex., etc.			. .	— 0.96

B. A. C. 2901.

1875.			h. m. s.	° ' "
April	5	E.	8 31 2.34	83 51 45.3
Nov.	14	Sk.	2.34	43.0
Dec.	12	P.	2.37	43.7
	20	P.	2.26	42.7
Mean . . .			8 31 2.328	83 51 43.68
Div., Flex., etc.			. .	— 0.18

O. Arg. N. 9187.

1875.			h. m. s.	° ' "
Mar.	8	E.	8 33 14.31	38 55 5.2
Div., Flex., etc.			. .	— 0.96

B. A. C. 2941.

1875.			h. m. s.	° ' "
Feb.	15	Sk.	8 35 43.81	129 49 18.4
Mar.	10	F.	44.12	18.0
Mean . . .			8 35 43.965	129 49 18.20
Div., Flex., etc.			. .	+ 0.35

B. A. C. 2984.

1875.			h. m. s.	° ' "
April	5	E.	8 42 46.05	56 14 56.7
Nov.	14	Sk.	46.09	58.2
Dec.	12	P.	46.01	56.9
Mean . . .			8 42 46.050	56 14 57.27
Div., Flex., etc.			. .	+ 0.08

B. A. C. 3009.

1875			h. m. s.	° ' "
Feb.	15	Sk.	8 44 59.90	129 51 22.2
Div., Flex., etc.			. .	+ 0.36

B. A. C. 3013.

1875.			h. m. s.	° ' "
Nov.	14	Sk.	8 45 48.07	84 11 28.9
Dec.	12	P.	48.01	28.3
	20	P.	48.01	28.5
Mean . . .			8 45 48.030	84 11 28.57
Div., Flex., etc.			. .	— 0.15

B. A. C. 3030.

1875.		h. m. s.	° ′ ″
Feb. 15	Sk.	8 48 1.68	128 15 14.4
April 5	E.	1.79	12.6
Mean . . .		8 48 1.735	128 15 13.50
Div., Flex., etc.		. .	+ 0.32

B. A. C. 3027.

1875.		h. m. s.	° ′ ″
Nov. 14	Sk.	8 48 23.41	49 19 17.5
Dec. 20	P.	23.41	17.6
22	F.	23.32	19.5
Mean . . .		8 48 23.380	49 19 18.20
Div., Flex., etc.		. .	— 0.50

B. A. C. 3081.

1875.		h. m. m.	° ′ ″
Feb. 15	Sk.	8 55 25.33	30 46 5.9
April 5	E.	25.55	5.6
Dec. 20	P.	25.38	5.5
Mean . . .		8 55 25.420	130 46 5.67
Div., Flex., etc.		. .	+ 0.37

B. A. C. 3105.

1875.		h. m. s.	° ′ ″
April 5	E.	8 59 23.56	84 24 33.2
Nov. 14	Sk.	23.41	33.8
Dec. 12	P.	23.52	33.6
Mean . . .		8 59 23.497	84 24 33.53
Div., Flex., etc.		. .	— 0.14

B. A. C. 3112.

1875.		h. m. s.	° ′ ″
April 5	S.	9 1 10.51	55 36 37.3
Nov. 14	Sk..	10.56	40.4
Dec. 12	P.	10.42	40.1
Mean . . .		9 1 10.497	55 36 39.27
Div., Flex., etc.		. .	+ 0.08

B. A. C. 3122.

1875.		h. m. s.	° ′ ″
Dec. 12	P.	9 2 58.63	77 55 38.7
20	P.	58.71	40.8
22	F.	58.69	40.7
Mean . . .		9 2 58.677	77 55 40.07
Div., Flex., etc.		. .	— 0.36

B. A. C. 3146.

1875.		h. m. s.	° ′ ″
April 5	E.	9 7 51.64	87 9 34.6
21	E.	51.46	36.2
Nov. 14	Sk.	51.76	34.9
Mean . . .		9 7 51.620	87 9 35.23
Div., Flex., etc.		. .	— 0.07

B. A. C. 3165.

1875.		h. m. s.	° ′ ″
Feb. 15	Sk.	9 10 44.79	126 53 37.4
Dec. 22	F.	44.87	38.2
Mean . . .		9 10 44.830	37.80
Div., Flex., etc.		. .	+ 0.28

B. A. C. 3162^1.

1875.		h. m. s.	° ′ ″
April 21 (7.0)	E.	9 11 3.39	52 40 14.3
Div., Flex., etc.		. .	— 0.19

B. A. C. 3162^2.

1875.		h. m. s.	° ′ ″
Mar. 12	E.	9 11 3.66	52 40 12.2
April 21	E.	3.66	12.7
Sept. 24	F.	3.66	13.5
Nov. 14	Sk.	3.65	10.4
Dec. 20	P.	3.66	11.4
Mean . . .		9 11 3.658	52 40 12.04
Div., Flex., etc.		. .	— 0.19

B. A. C. 3178.

1875.		h. m. s.	° ′ ″
April 5	E.	9 13 26.10	55 4 49.9
Nov. 14	Sk.	26.05	49.6
Dec. 12	P.	26.02	48.4
20	P.	26.09	48.2
22	F.	26.11	48.4
Mean . . .		9 13 26.074	55 4 48.90
Div., Flex., etc.		. .	+ 0.06

B. A. C. 3192.

1875.		h. m. s.	° ′ ″
Feb. 15	Sk.	9 15 27.01	121 14 9.9
Dec. 22	F.	27.05	8.3
Mean . . .		9 15 27.030	121 14 9.10
Div., Flex., etc.		. .	+ 0.25

B. A. C. 3238.

1875.		h. m. s.	° ′ ″
April 8	Sk.	9 23 9.66	55 47 48.8
Div., Flex., etc.		. .	+ 0.09

B. A. C. 3250.

1875.		h. m. s.	° ′ ″
April 8	Sk.	9 25 12.43	78 8 52.7
Nov. 14	Sk.	12.51	52.6
Dec. 12	P.	12.39	52.7
Mean . . .		9 25 12.443	78 8 52.67
Div., Flex., etc.		. .	— 0.36

B. A. C. 3257.

1875.		h. m. s.	° ′ ″
April 5	E.	9 25 46.79	129 55 16.2
Div., Flex., etc.		. .	+ 0.36

B. A. C. 3267.

1875.		h. m. s.	° ′ ″
April 5	E.	9 27 21.65	130 5 50.4
Div., Flex., etc.		. .	+ 0.36

B. A. C. 3273.

1875.		h. m. s.	° ′ ″
April 21	E.	9 29 17.58	58 16 46.1
Nov. 14	Sk.	17.62	45.8
Mean . . .		9 29 17.600	58 16 45.95
Div., Flex., etc.		. .	— 0.05

B. A. C. 3295.

1875.		h. m. s.	° ′ ″
April 14 (5.5)	F.	9 31 56.03	84 47 15.7
Dec. 20	P.	56.03	14.3
22	F.	56.07	14 4
Mean . . .		9 31 56.043	84 47 14.80
Div., Flex., etc.		. .	— 0.11

B. A. C. 3317.

1875.		h. m. s.	° ′ ″
April 14 (6.0)	F.	9 36 13.31	59 27 8.8
Nov. 14	Sk.	13.42	7.6
Dec. 20	P.	13.33	8.5
Mean . . .		9 36 13.353	59 27 8.30
Div., Flex., etc.		. .	— 0.10

B. A. C. 3321.

1875.		h. m. s.	° ′ ″
April 21	E.	9 36 55.42	75 24 28.6
Dec. 22	F.	55.38	28.8
Mean . . .		9 36 55.400	75 24 28.70
Div., Flex., etc.		. .	— 0.36

B. A. C. 3398.

1875.		h. m. s.	° ′ ″
April 7 (6.0)	F.	9 49 48.24	80 28 33.8
14	F.	48.38	32.1
21	E.	48.41	32.7
Mean . . .		9 49 48.343	80 28 32.87
Div., Flex., etc.		. .	— 0.39

B. A. C. 3403.

1875.		h. m. s.	° ′ ″
April 8 (8.0)	Sk.	9 50 43.90	120 29 58.2
Div., Flex., etc.		. . .	+ 0.24

B. A. C. 3417.

1875.		h. m. s.	° ′ ″
April 8 (7.0)	Sk.	9 53 30.61	125 17 40.1
21	E.	30.61	40.3
Mean . . .		9 53 30.610	125 17 40.20
Div., Flex., etc.		. .	+ 0.22

B. A. C. 3423.

1875.		h. m. s.	° ′ ″
April 5	E.	9 55 50.67	67 26 55.5
7 (6.5)	F.	50.55	56.6
14 (6.5)	F.	50.65	54.1
Mean . . .		9 55 50.623	67 26 55.40
Div., Flex., etc.		. .	— 0.21

B. A. C. 3453.

1875.		h. m. s.	° ′ ″
April 7 (3.0)	F.	10 0 30.87	72 37 45.5
14 (3.5)	F.	30.95	44.4
Sept. 10	F.	30.96	42.3
24	F.	30.94	44.9
Dec. 20	P.	30.97	44.4
Mean . . .		10 0 30.938	72 37 44.30
Div., Flex., etc.		. .	— 0.36

B. A. C. 3469.

1875.		h. m. s.	° ′ ″
April 5	E.	10 3 57.05	73 40 47.1
7	F.	57.09	48.8
Dec. 20	P.	57.18	47.9
Mean . . .		10 3 57.107	73 40 47.93
Div., Flex,etc.		. .	— 0.39

B. A. C. 3494.

1875.		h. m. s.	° ′ ″
April 21	E.	10 7 43.66	122 24 56.3
Div., Flex., etc.		. .	+ 0.24

B. A. C. 3511.

1875.		h.	m.	s.	°	'	"
April 5	E.	10	10	21.87	66	16	1.7
7	F.			21.71			5.1
Dec. 12	P.			21.81			2.9
20	P.			21.82			4.5
Mean . . .		10	10	21.802	66	16	3.55
Div., Flex., etc.				. .		—	0.17

B. A. C. 3532.

1875.		h.	m.	s.	°	'	"
Dec. 12	P.	10	14	34.69	87	4	54.9
20	P.			34.75			56.1
22	F.			34.72			56.1
Mean . . .		10	14	34.720	87	4	55.70
Div., Flex., etc.				. .		—	0.07

B. A. C. 3539.

1875.		h.	m.	s.	°	'	"
Dec. 20	P.	10	15	50.94	54	9	9.7
22	F.			50.96			6.7
Mean . . .		10	15	50.950	54	9	8.20
Div., Flex., etc.				. .			0.00

B. A. C. 3572.

1875.		h.	m.	s.	°	'	"
April 5	E.	10	20	38.92	52	39	9.5
14 (4.5)	F.			39.01			12.6
21	E.			39.00			12.5
Mean . . .		10	20	38.977	52	39	11.53
Div., Flex., etc.				. .		—	0.19

B. A. C. 3575.

1875.		h.	m.	s.	°	'	"
April 21	E.	10	21	. .	79	36	4.0
May 12 (6.0)	F.			2.67			6.2
Dec. 20	P.			2.73			4.3
Mean . . .		10	21	2.700	79	36	4.83
Div., Flex., etc.				. .		—	0.40

B. A. C. 3600.

1875.		h.	m.	s.	°	'	"
April 5	E.	10	24	3.46	87	12	30.2
7 (6.0)	F.			3.49			32.8
8	Sk.			3.61			34.8
Mean . . .		10	24	3.520	87	12	32.60
Div., Flex., etc.				. .		—	0.06

B. A. C. 3622^1.

1875.		h.	m.	s.	°	'	"
May 12 (5.5)	F.	10	28	28.49	80	42	16.4
Dec. 12	P.			28.50			15.9
20	P.			28.58			15.4
22	F.			28.57			16.3
Mean . . .		10	28	28.535	80	42	16.00
Div., Flex., etc.				. .		—	0.39

B. A. C. 3625.

1875.		h.	m.	s.	°	'	"
April 5	E.	10	29	10.57	53	1	31.2
8	Sk.			10.74			35.0
14	F.			10.79			33.1
Mean . . .		10	29	10.700	53	1	33.10
Div., Flex., etc.				. .		—	0.15

ANONYMOUS.

1875.		h.	m.	s.	°	'	"
April 5	E.	10	35	39.47	96	26	. .
14	F.			39.29			11.2
Mean . . .		10	35	39.38	96	26	11.20
Div., Flex., etc.				. .		+	0.04

ANONYMOUS.

1875.		h.	m.	s.	°	'	"
April 5	E.	10	36	48.53	96	22	1.5
14	F.			48.29			1.3
Mean . . .		10	36	48.41	96	22	1.40
Div., Flex., etc.				. .		+	0.05

ANONYMOUS.

1875.		h.	m.	s.	°	'	"
April 7	F.	10	36	58.82	98	25	36.6
8	Sk.			58.93			35.4
Mean . . .		10	36	58.875	98	25	36.00
Div., Flex., etc.				. .		—	0.08

B. A. C. 3684.

1875.		h.	m.	s.	°	'	"
April 20	Sk.	10	38	42.97	86	51	21.6
Dec. 12	P.			42.98			19.0
20	P.			43.06			18.9
Mean . . .		10	38	43.003	86	51	19.83
Div., Flex., etc.				. .		—	0.07

B. A. C. 3728.

1875.		h.	m.	s.	°	'	"
April 21	E.	10	46	18.97	55	6	42.6
29	E.			18.83			43.5
May 10	Sk.			19.04			45.6
Mean . . .		10	46	18.947	55	6	43.90
Div., Flex., etc.				. .		+	0.06

B. A. C. 3742^1.

1875.		h.	m.	s.	°	'	"
Apr. 21	E.	10	48	50.51	64	35	3.4
29	E.			50.48			4.2
May 4 (4.5)	F.			. .			2.4
Mean . . .		10	48	50.495	64	35	3.33
Div., Flex., etc.				. .		—	0.14

B. A. C. 3742^2.

1875.		h.	m.	s.	°	'	"
April 21	E.	10	48	51.03	64	35	5.0
29	E.			50.92			4.8
Mean . . .		10	48	50.975	64	35	4.90
Div., Flex., etc.				. .		—	0.14

B. A. C. 3763.

1875.		h.	m.	s.	°	'	"
May 12	F.	10	53	19.85	123	3	59.6
Div., Flex., etc.				. .		+	0.23

B. A. C. 3776.

1875.		h.	m.	s.	°	'	"
Apr. 21	E.	10	55	39.28	69	9	1.1
29	E.			39.22			1.1
May 4 (4.0)	F.			39.24			1.2
Mean . . .		10	55	39.247	69	9	1.13
Div., Flex., etc.				. .		—	0.29

B. A. C. 3809.

1875.		h.	m.	s.	°	'	"
Apr. 21	E.	11	2	6.54	64	39	55.7
29	E.			6.52			56.0
May 4 (6.0)	F.			6.57			57.0
11	E.			(6.39)			55.4
12 (5.5)	F.			6.54			55.8
Mean . . .		11	2	6.542	64	39	55.98
Div., Flex., etc.				. .		—	0.14

B. A. C. 3822.

1875.		h.	m.	s.	°	'	"
April 8 (7.8)	Sk.	11	3	53.17	121	41	24.3
Div., Flex., etc.				. .		+	0.25

B. A. C. 3838.

1875.		h.	m.	s.	°	'	"
April 8 (4.0)	Sk.	11	7	40.73	73	53	17.6
Div., Flex., etc.				. .		—	0.40

B. A. C. 3843.

1875.		h.	m.	s.	°	'	"
May 10	Sk.	11	9	19.48	76	0	42.0
11	E.			19.39			40.8
12 (5.5)	F.			19.39			40.2
Mean . . .		11	9	19.420	76	0	41.00
Div., Flex., etc.				. .		—	0.34

B. A. C. 3851.

1875.		h.	m.	s.	°	'	"
May 11	E.	11	11	30.51	57	46	6.0
12 (4.0)	F.			30.59			5.6
27	E.			30.69			5.0
Mean . . .		11	11	30.597	57	46	5.53
Div., Flex., etc.				. .		—	0.03

B. A. C. 3890.

1875.		h.	m.	s.	°	'	"
April 8 (8.0)	Sk.	11	19	26.15	125	22	40.1
29	E.			26.12			37.8
Mean . . .		11	19	26.135	125	22	38.95
Div., Flex., etc.				. .		+	0.22

ANONYMOUS.

1875.		h.	m.	s.	°	'	"
Dec. 18	F.	11	19	47.58	126	13	5.0
Div., Flex., etc.				. .		+	0.25

ANONYMOUS.

1875.		h.	m.	s.	°	'	"
Dec. 20	P.	11	20	27.97	126	11	47.3
22	F.			28.09			48.5
Mean . . .		11	20	28.030	126	11	47.90
Div., Flex., etc.				. .		+	0.25

B. A. C. 3930.

1875.		h.	m.	s.	°	'	"
Apr. 29	E.	11	27	58.11	86	14	46.7
May 4 (6.0)	F.			58.06			45.1
13	Sk.			58.08			46.3
27	E.			58.05			45.2
Mean . . .		11	27	58.075	86	14	45.82
Div., Flex., etc.				. .		—	0.07

B. A. C. 3945.

1875.		h.	m.	s.	°	'	"
May 12	F.	11	30	23.19	122	52	40.6
Div., Flex., etc.				. .		+	0.23

Lacaille 4852.

1875.	h.	m.	s.	°	'	"
Dec. 22 F.	11	35	11.10	132	24	9.3
Div., Flex., etc.			. .		+	0.39

Lalande 22168.

1875.	h.	m.	s.	°	'	"
April 5 E.	11	36	50.87	61	15	9.1
Div., Flex., etc.			. .		—	0.07

B. A. C. 3973.

1875.	h.	m.	s.	°	'	"
Apr. 7 F.	11	36	59.89	47	35	4.0
14 F.		37	0.04			2.9
29 E.		36	59.91			5.4
May 4 (6.0) F.			59.84			3.8
Mean . . .	11	36	59.920	47	35	4.02
Div., Flex., etc.			. .		—	0.71

Lalande 22335.

1875.	h.	m.	s.	°	'	"
April 5 E.	11	42	42.63	61	11	3.1
Div., Flex., etc.			. .		—	0.07

B. A. C. 4002.

1875.	h.	m.	s.	°	'	"
Apr. 8 (6.0) Sk.	11	44	11.24	87	31	54.2
Sept. 24 F.			11.35			54.2
Nov. 21 P.			11.10			50.3
Mean . . .	11	44	11.23	87	31	52.90
Div., Flex., etc.			. .		—	0.05

Lalande 22349.

1875.	h.	m.	s.	°	'	"
April 5 E.	11	44	15.43	61	12	32.1
Div., Flex., etc.			. .		—	0.07

B. A. C. 4046.

1875.	h.	m.	s.	°	'	"
April 8 (8.8) Sk.	11	53	10.11	124	36	49.6
29 E.			9.95			47.6
May 10 (8.2) Sk.			9.91			47.3
Mean . . .	11	53	9.990	124	36	48.17
Div., Flex., etc.			. .		+	0.21

Weisse (2) 1028.

1875.	h.	m.	s.	°	'	"
April 5 E.	11	53	32.86	61	10	58.3
Div., Flex., etc.			. .		—	0.07

B. A. C. 4092.

1875.	h.	m.	s.	°	'	"
May 13 Sk.	12	2	. .	130	32	7.0
Div., Flex., etc.			. .		+	0.37

B. A. C. 4099.

1875.	h.	m.	s.	°	'	"
April 29 E.	12	4	9.31	72	29	44.1
May 4 (6.5) F.			9.31			43.0
10 Sk.			9.38			44.4
Mean . . .	12	4	9.333	72	29	43.83
Div., Flex., etc.			. .		—	0.35

B. A. C. 4113.

1875.	h.	m.	s.	°	'	"
May 13 Sk.	12	6	. .	128	14	0.5
28 F.			55.30		13	57.5
Mean . . .	12	6	55.30	128	13	59.00
Div., Flex., etc.			. .		+	0.32

B. A. C. 4124.

1875.	h.	m.	s.	°	'	"
April 7 (3.0) F.	12	9	22.80	106	50	51.8
22 (3.0) F.			22.83			51.3
May 10 (4.0) Sk.			23.01			52.9
July 8 E.			22.77			53.4
Oct. 26 F.			22.72			48.7
31 P.			22.75			50.3
Nov. 1 P.			22.72			52.8
Mean . . .	12	9	22.800	106	50	51.60
Div., Flex., etc.			. .		—	0.07

B. A. C. 4142.

1875.	h.	m.	s.	°	'	"
May 4 (6.5) F.	12	13	13.78	61	8	41.2
10 Sk.			13.75			42.6
11 E.			13.77			. .
Mean . . .	12	13	13.767	61	8	41.90
Div., Flex., etc.			. .		—	0.07

B. A. C. 4184.

1875.	h.	m.	s.	°	'	"
April 7 (6.0) F.	12	18	57.74	65	22	48.7
22 (6.0) F.			57.74			46.7
29 E.			57.70			48.5
May 4 (6.0) F.			57.70			46.8
Mean . . .	12	18	57.720	65	22	47.68
Div., Flex., etc.			. .		—	0.15

B. A. C. 4210.

1875.	h.	m.	s.	°	'	"
May 13 Sk.	12	23	16.74	131	2	37.6
28 F.			16.67			37.2
Mean . . .	12	23	16.705	131	2	37.40
Div., Flex., etc.			. .		+	0.37

B. A. C. 4211.

1875.	h.	m.	s.	°	'	"
May 27 E.	12	23	23.94	105	49	13.8
July 8 E.			23.68			12.5
Oct. 26 F.			23.94			8.1
31 P.			23.86			9.6
Nov. 1 P.			23.86			10.3
8 P.			23.98			10.7
21 P.			23.86			10.2
Mean . . .	12	23	23.874	105	49	10.74
Div., Flex., etc.			. .		—	0.04

B. A. C. 4212.

1875.	h.	m.	s.	°	'	"
April 29 E.	12	23	26.42	68	24	42.6
May 4 (6.0) F.			26.38			42.2
10 Sk.			26.42			42.9
Mean . . .	12	23	26.407	68	24	42.57
Div., Flex., etc.			. .		—	0.26

B. A. C. 4227.

1875.	h.	m.	s.	°	'	"
May 13 Sk.	12	26	46.07	130	43	24.9
Div., Flex., etc.			. .		+	0.37

B. A. C. 4235.

1875.	h.	m.	s.	°	'	"
April 29 E.	12	27	48.18	47	57	47.3
May 4 (4.0) F.			48.12			47.0
10 Sk.			48.13			49.1
Mean . . .	12	27	48.143	47	57	47.80
Div., Flex., etc.			. .		—	0.66

Weisse 498.

1875.	h.	m.	s.	°	'	"
Dec. 22 F.	12	31	7.19	92	52	52.3
Div., Flex., etc.			. .		+	0.04

B. A. C. 4296.

1875.	h.	m.	s.	°	'	"
April 22 (6.0) F.	12	41	29.56	85	44	40.0
29 E.			29.58			40.8
May 7 E.			29.50			41.4
Mean . . .	12	41	29.547	85	44	40.73
Div., Flex., etc.			. .		—	0.08

B. A. C. 4315.

1875.	h.	m.	s.	°	'	"
April 7 (5.5) F.	12	45	36.48	61	46	43.5
22 (5.5) F.			36.50			42.1
May 4 (5.0) F.			36.54			43.2
Mean . . .	12	45	36.507	61	46	42.93
Div., Flex., etc.			. .		—	0.06

B. A. C. 4321.

1875.	h.	m.	s.	°	'	"
Feb. 22 (5.0) S.	12	46	31.45	129	29	59.6
April 5 (3.0) E.			31.18			56.6
May 10 (5.8) Sk.			31.36			55.8
Mean . . .	12	46	31.330	129	29	57.33
Div., Flex., etc.			. .		+	0.34

32^1 Camelopardalis.

1875.	h.	m.	s.	°	'	"
May 7 E.	12	48	5.70	5	54	12.0
11 E.			. .			13.6
27 E.			5.59			7.8
31 E.			6.54			9.7
June 4 E.			5.86			12.1
Mean . . .	12	48	5.922	5	54	11.04
Div., Flex., etc.			. .		—	1.06

32^1 Camelopardalis, S. P.

1875.	h.	m.	s.	°	'	"
Aug. 13 P.	12	48	6.22	354	5	54.6
20 P.			4.90			55.6
Sept. 14 P.			5.53			. .
24 P.			5.60			52.3
Nov. 2 P.			5.62			52.5
10 Sk.			5.05			52.8
17 P.			6.05			52.3
Mean . . .	12	48	5.567			53.35
Div., Flex., etc.			. .		—	1.19

B. A. C. 4340.

1875.	h.	m.	s.	°	'	"
Oct. 26 F.	12	49	18.40	85	55	. .
31 P.			18.47			20.3
Nov. 1 P.			18.46			22.2
8 P.			18.50			21.1
11 P.			18.42			. .
Mean . . .	12	49	18.450	85	55	21.20
Div., Flex., etc			. .		—	0.07

12^1 Canum Venaticorum.

1875.	h.	m.	s.	°	'	"
Feb. 22 S.	12	50	9.34	51	0	36.2
Div., Flex., etc.			. .		—	0.36

B. A. C. 4351.

1875.	h. m. s.	° ′ ″
April 22 (4.0) F.	12 52 44.56	71 54 58.5
May 4 F.	44.54	59.2
Mean . . .	12 52 44.550	71 54 58.85
Div., Flex , etc.	. .	− 0.34

B. A. C. 4355.

1875.	h. m. s.	° ′ ″
May 13 Sk.	12 53 42.53	122 49 40.8
Div., Flex., etc.	. .	+ 0.23

B. A. C. 4367.

1875.	h. m. s.	° ′ ″
May 12 (4.0) F.	12 55 57.17	78 22 8.2
27 E.	57.22	7.7
July 8 E.	57.23	9.3
Oct. 26 F.	57.15	7.0
31 P.	57.23	6.6
Nov. 1 P.	57.22	7.6
8 P.	57.28	6.4
10 E.	57.25	6.6
11 P.	57.20	7.1
16 P.	57.28	6.9
Mean . . .	12 55 57.223	78 22 7.34
Div., Flex., etc.	. .	− 0.37

B. A. C. 4374.

1875.	h. m. s.	° ′ ″
Feb. 22 (7.0) S.	12 57 46.17	130 31 30.5
April 5 E.	46.17	30.0
May 13 Sk.	46.17	29.5
28 (5.0) F.	46.12	28.3
Mean . . .	12 57 46.158	130 31 29.58
Div., Flex., etc.	. .	+ 0.37

B. A. C. 4390.

1875.	h. m. s.	° ′ ″
April 21 E.	13 1 10.84	61 42 13.8
22 F.	10.75	13.8
May 4 (4.0) F.	10.72	13.8
7 E.	10.70	16.6
Mean . . .	13 1 10.752	61 42 14.50
Div., Flex., etc.	. .	− 0.06

LACAILLE 5410.

1875.	h. m. s.	° ′ ″
April 5 (7.0) E.	13 2 6.03	122 50 2.7
May 10 (8.3) Sk.	6.12	0.6
12 F.	5.95	2.8
Mean . . .	13 2 6.033	122 50 2.03
Div., Flex., etc.	. .	+ 0.23

B. A. C. 4433.

1875.	h. m. s.	° ′ ″
April 22 (5.0) F.	13 8 2.73	49 11 8.9
May 4 (5.0) F.	2.74	6.3
11 E.	2.62	8.4
Mean . . .	13 8 2.697	49 11 7.87
Div., Flex., etc.	. .	− 0.51

B. A. C. 4462.

1875.	h. m s.	° ′ ″
May 11 E.	13 14 15.04	84 30 59.6
12 F.	15.01	59.9
17 (7.0) F.	14.94	57.8
Mean . . .	13 14 14.997	84 30 59.10
Div., Flex., etc.	. .	− 0.13

B. A. C. 4467.

1875.	h. m. s.	° ′ ″
May 11 E.	13 14 42.61	49 11 36.0
19 E.	42.71	37.1
27 E.	42.70	34.6
Mean . . .	13 14 42.673	49 11 35.90
Div., Flex., etc.	. .	− 0.51

B. A. C. 4518.

1875.	h. m. s.	° ′ ″
April 5 E.	13 25 44.56	129 19 41.4
21 E.	44.71	39.8
May 17 (7.0) F.	44.80	38.1
Mean . . .	13 25 44.690	129 19 39.77
Div., Flex., etc.	. .	+ 0.34

B. A. C. 4522.

1875.	h. m. s.	° ′ ″
April 5 E.	13 26 31.08	129 18 13.1
21 E.	31.21	12.9
May 17 (6.0) F.	31.22	12.9
Mean . . .	13 26 31.170	129 18 12.97
Div., Flex., etc.	. .	+ 0.34

B. A. C. 4566.

1875.	h. m. s.	° ′ ″
April 21 E.	13 35 7.57	66 52 13.8
22 (6.0) F.	7.47	13.9
May 4 (5.0) F.	7.55	14.1
Mean . . .	13 35 7.530	66 52 13.93
Div., Flex., etc.	. .	− 0.18

B. A. C. 4575.

1875.	h. m. s.	° ′ ″
April 22 (6.5) F.	13 37 . .	66 40 5.8
May 4 F.	50.80	7.0
11 E.	50.72	7.5
Mean . . .	13 37 50.760	66 40 6.77
Div., Flex., etc.	. .	− 0.17

B. A. C. 4601.

1875.	h. m. s.	° ′ ″
Feb. 22 (4.0) S.	13 42 0.96	131 3 52.0
May 13 Sk.	0.94	51.1
Mean . . .	13 42 0.950	131 3 51.50
Div., Flex., etc.	. .	+ 0.37

B. A. C. 4624.

1875.	h. m. s.	° ′ ″
May 19 E.	13 44 51.06	120 59 55.5
Div., Flex., etc.	. .	+ 0.25

B. A. C. 4629¹.

1875.	h. m. s.	° ′ ″
Feb. 22 (8.5) S.	13 46 1.14	121 18 51.0
Div., Flex., etc.	. .	+ 0.25

B. A. C. 4629².

1875.	h. m. s.	° ′ ″
Feb. 22 (4.5) S.	13 46 1.30	121 18 35.2
May 19 E.	1.11	34.9
June 4 E.	1.22	34.8
Mean . . .	13 46 1.210	121 18 34.97
Div., Flex., etc.	. .	+ 0.25

B. A. C. 4674.

1875.	h. m. s.	° ′ ″
May 17 (6.0) F.	13 55 46.69	121 4 56.2
June 4 E.	46.62	56.2
Mean . . .	13 55 46.655	121 4 56.20
Div., Flex., etc.	. .	+ 0.25

B. A. C. 4681.

1875.	h. m. s.	° ′ ″
June 4 E.	13 58 25.33	130 34 47.7
26 (6.0) F.	25.34	48.1
Mean . . .	13 58 25.335	130 34 47.90
Div., Flex., etc.	. .	+ 0.37

B. A. C. 4759.

1875.	h. m. s.	° ′ ″
April 21 E.	14 15 20.52	128 56 22.3
May 31 E.	20.61	24.3
Mean . . .	14 15 20.565	128 56 23.30
Div., Flex., etc.	. .	+ 0.33

ANONYMOUS.*

1875.	h. m. s.	° ′ ″
May 11 E.	14 22 40.59	110 19 45.4
Div., Flex., etc.	. .	− 0.04

* Faint; observed for Pandora.

B. A. C. 4812.

1875.	h. m. s.	° ′ ″
Nov. 12 F.	14 27 2.87	51 8 40.5
Div., Flex., etc.	. .	− 0.35

B. A. C. 4813.

1875.	h. m. s.	° ′ ″
Feb. 22 S.	14 27 37.69	130 58 7.0
Div., Flex., etc.	. .	+ 0.37

α^1 LIBRÆ.

1875.	h. m. s.	° ′ ″
Feb. 22 S.	14 43 46.53	105 28 27.3
Div., Flex., etc.	. .	− 0.03

B. A. C. 4954.

1875.	h. m. s.	° ′ ″
April 21 E.	14 57 12.06	130 34 38.0
June 4 E.	12.15	39.7
July 8 E.	12.17	40.5
Mean . . .	14 57 12.127	130 34 39.40
Div., Flex., etc.	. .	+ 0.37

B. A. C. 4996.

1875.	h. m. s.	° ′ ″
April 21 E.	15 5 15.04	125 37 5.9
June 4 E.	15.10	6.5
16 E.	14.97	8.6
Mean . . .	15 5 15.037	125 37 7.00
Div., Flex., etc.	. .	+ 0.23

B. A. C. 5017.

1875.	h. m. s.	° ′ ″
June 4 E.	15 7 51.05	131 1 32.1
July 8 E.	51.05	31.9
Mean . . .	15 7 51.050	131 1 32.00
Div., Flex., etc.	. .	+ 0.37

B. A. C. 5046.

1875.	h. m. s.	° ′ ″
July 8 E.	15 13 10.43	130 11 38.2
Div., Flex., etc.	. .	+ 0.36

B. A. C. 5054.

1875.	h. m. s.	° ′ ″
June 16 E.	15 13 52.84	125 48 22.0
Div., Flex., etc.	. .	+ 0.23

B. A. C. 5065.

1875.	h. m. s.	° ′ ″
July 8 E.	15 16 35.44	129 15 28.6
Div., Flex., etc.	. .	+ 0.34

B. A. C. 5069.

1875.	h. m. s.	° ′ ″
June 16 E.	15 17 14.23	128 17 20.3
Div., Flex., etc.	. .	+ 0.32

B. A. C. 5118.

1875.	h. m. s.	° ′ ″
June 4 E.	15 26 49.01	130 44 40.8
16 E.	49.09	41.3
July 1 (4.0) Sk.	. .	39.4
Mean . . .	15 26 49.050	130 44 40.50
Div., Flex., etc.	. .	+ 0.37

B. A. C. 5160.

1875.	h. m. s.	° ′ ″
May 31 E.	15 31 49.81	124 0 8.1
June 4 E.	49.94	6.9
Mean . . .	15 31 49.875	124 0 7.50
Div., Flex., etc.	. .	+ 0.22

B. A. C. 5199.

1875.	h. m. s.	° ′ ″
May 31 E.	15 38 45.47	124 17 23.0
Div., Flex., etc.	. .	+ 0.22

B. A. C. 5216.

1875.	h. m. s.	° ′ ″
Oct. 27 F.	15 40 25.27	74 11 9.7
Nov. 2 P.	25.19	8.7
Mean . . .	15 40 25.230	74 14 9.20
Div., Flex., etc.	. .	− 0.40

B. A. C. 5230.

1875.	h. m. s.	° ′ ″
May 31 E.	15 43 5.92	93 2 48.0
Div., Flex., etc.	. .	+ 0.05

B. A. C. 5261.

1875.	h. m. s.	° ′ ″
May 31 E.	15 47 41.45	120 42 53.3
Div., Flex., etc.	. .	+ 0.25

Lalande 28969.

1875.	h. m. s.	° ′ ″
June 16 E.	15 48 37.99	81 3 1.1
Div., Flex., etc,	. .	− 0.38

Lalande 28975.

1875.	h. m. s.	° ′ ″
June 16 E.	15 48 47.43	81 2 47.5
Div., Flex., etc.	. .	− 0.38

B. A. C. 5284.

1875.	h. m. s.	° ′ ″
Aug. 9 P	15 50 40.77	73 55 45.7
Nov. 2 P.	40.89	46.4
Dec. 19 P.	40.75	46.3
Mean . . .	15 50 40.803	73 55 46.13
Div., Flex., etc.	. .	− 0.40

Weisse 983.

1875.	h. m. s.	° ′ ″
June 16 E.	15 52 53.29	81 4 40.7
Div., Flex., etc.	. .	− 0.38

Lalande 29122.

1875.	h. m. s.	° ′ ″
June 16 E.	15 54 4.86	81 1 25.9
Div., Flex., etc.	. .	− 0.38

β² Scorpii.

1875.	h. m. s.	° ′ ″
Feb. 26 S.	15 58 10.80	109 27 29.5
Div., Flex., etc.	. .	− 0.07

Lalande 29319.

1875.	h. m. s.	° ′ ″
May 31 E.	15 58 43.60	53 1 21.5
June 4 E.	43.59	20.6
13 E.	43.63	22.2
Mean . . .	15 58 43.607	53 1 21.43
Div., Flex., etc.	. .	− 0.15

Lalande 29334.

1875.	h. m. s.	° ′ ″
June 16 E.	16 0 9.26	81 3 57.7
Div., Flex., etc.	. .	− 0.38

Lalande 29403.

1875.	h. m. s.	° ′ ″
May 31 E.	16 1 18.23	53 3 42.4
June 4 E.	18.29	41.0
13 E.	18.26	42.8
Mean . . .	16 1 18.260	53 3 42.07
Div., Flex., etc.	. .	− 0.14

B. A. C. 5355¹.

1875.	h. m. s.	° ′ ″
July 13 F.	16 1 34.58	122 18 52.7
Div., Flex., etc.	. .	+ 0.24

B. A. C. 5355².

1875.	h. m. s.	° ″
July 13 F.	16 1 35.21	122 18 53.0
Div., Flex., etc.	. .	+ 0.24

Lalande 29433.

1875.	h. m. s.	° ′ ″
May 31 E.	16 1 54.67	53 5 1.8
June 4 E.	54.69	3.5
13 E.	54.63	4.1
Mean . . .	16 1 54.663	53 5 3.13
Div., Flex., etc.	. .	− 0.14

Lalande 29417.

1875.	h. m. s.	° ′ ″
June 16 E.	16 2 26.58	81 8± . .

Lalande 29423.

1875.	h. m. s.	° ′ ″
June 16 E.	16 2 35.30	81 3 11.1
Div., Flex., etc.	. .	− 0.38

Lalande 29638.

1875.	h. m. s.	° ′ ″
May 31 E.	16 8 28.39	53 2 42.0
June 4 E.	28.42	39.9
Mean . . .	16 8 28.405	53 2 40.95
Div., Flex., etc.	. .	− 0.14

Lalande 29685.

1875.	h. m. s.	° ′ ″
May 31 E.	16 10 15.02	52 59 49.7
June 4 E.	14.98	46.5
13 F.	15.12	48.2
Mean . . .	16 10 15.040	52 59 48.13
Div., Flex., etc.	. .	− 0.15

Lalande 29708.

1875.	h. m. s.	° ′ ″
May 31 E.	16 11 18.04	53 8 2.6
June 4 E.	18.10	0.2
13 F.	18.11	2.8
Mean . . .	16.11 18.083	53 8 1.87
Div., Flex., etc.	. .	− 0.13

B. A. C. 5437.

1875.	h. m. s.	° ′ ″
July 30 E.	16 11 42.53	94 23 11.5
Nov. 11 E.	42.58	12.8
Mean . . .	16 11 42.555	94 23 12.15
Div., Flex., etc.	. .	+ 0.09

σ Scorpii.

1875.	h. m. s.	° ′ ″
Aug. 20 P.	16 13 35.51	115 17 28.9
21 P.	35.70	26.7
Mean . . .	16 13 35.605	115 17 27.80
Div., Flex., etc.	. .	+ 0.17

B. A. C. 5466.

1875.	h. m. s.	° ′ ″
July 30 E.	16 16 24.34	70 33 8.6
Div., Flex., etc.	. .	− 0.32

B. A. C. 5525.

1875.	h. m. s.	° ′ ″
July 30 E.	16 24 50.76	68 14 13.7
Div., Flex., etc.	. .	− 0.25

B. A. C. 5587.

1875.	h. m. s.	° ′ ″
July 13 (7.0) F.	16 35 2.14	77 21 39.3
Div., Flex., etc.	. .	− 0.34

B. A. C. 5583.

1875.	h. m. s.	° ′ ″
June 4 E.	16 35 5.47	130 52 43.6
Div., Flex., etc.	. .	+ 0.37

B. A. C. 5584.

1875	h. m. s.	° ′ ″
June 4 E.	16 35 13.65	130 52 19.2
Div., Flex., etc.	. .	+ 0.37

B. A. C. 5596.

1875.	h. m. s.	° ′ ″
July 30 E.	16 35 21.43	40 49 33.1
Div., Flex., etc.	. .	− 0.92

XVI, 16.

1875.	h. m. s.	° ′ ″
July 14 E.	16 35 23.74	116 13 4.1
Div., Flex., etc.	. .	+ 0.18

XVI, 15.

1875.	h. m. s.	° ′ ″
July 14 E.	16 36 10.30	112 29 52.7
Div., Flex., etc.	. .	+ 0.07

B. A. C. 5604.

1875.	h. m. s.	° ′ ″
Feb. 27 Sk.	16 36 34.15	58 20 11.6
Div., Flex., etc.	. .	− 0.06

XVI, 19.

1875.	h. m. s.	° ′ ″
June 9 F.	16 39 35.41	109 52 13.5
Div., Flex., etc.	. .	− 0.06

B. A. C. 5620.

1875.	h. m. s.	° ′ ″
July 13 F.	16 39 42.93	74 1 22.3
Div., Flex., etc.	. .	− 0.40

B. A. C. 5628.

1875.	h. m. s.	° ′ ″
July 30 E.	16 40 3.52	25 10 28.0
Div., Flex., etc.	. .	− 1.09

B. A. C. 5629.

1875.	h. m. s.	° ′ ″
Aug. 21 P.	16 40 25.35	34 4 46.9
25 P.	25.13	. .
30 P.	24.96	47.0
Mean . . .	16 40 25.147	34 4 46.95
Div., Flex., etc.	. .	− 1.06

XVI, 21.

1875.	h. m. s.	° ′ ″
July 7 F.	16 40 38.14	114 18 4.4
Div., Flex., etc.	. .	+ 0.15

B. A. C. 5717.

1875.	h. m. s.	° ′ ″
June 9 (6.0) F.	16 52 19.87	29 26 15.5
Div., Flex., etc.	. .	− 1.03

B. A. C. 5740.

1875.	h. m. s.	° ′ ″
June 13 F.	16 55 20.84	24 40 29.1
Div., Flex., etc.	. .	− 1.09

B. A. C. 5731.

1875.	h. m. s.	° ′ ″
July 30 E.	16 55 30.45	58 53 19.3
Aug. 9 P.	30.41	17.6
26 Sk.	30.42	18.8
Dec. 19 P.	30.48	18.5
20 E.	30.46	19.4
Mean . . .	16 55 30.444	58 53 18.72
Div., Flex., etc.	. .	− 0.08

B. A. C. 5745.

1875.	h. m. s.	° ′ ″
June 9 (6.5) F.	16 55 48.28	24 46 17.0
Div., Flex , etc.	. .	− 1.09

B. A. C. 5752.

1875.	h. m. s.	° ′ ″
June 9 (5.5) F.	16 57 3.91	33 7 41.3
13 F.	4.31	40.8
Mean . . .	16 57 4.110	33 7 41.05
Div., Flex., etc.	. .	− 1.04

ANONYMOUS.

1875.	h. m. s.	° ′ ″
July 3 (10.5) F.	16 57 37.84	113 48 11.3
Div., Flex , etc.	. .	+ 0.13

ANONYMOUS.

1875.	h. m. s.	° ′ ″
July 3 (10.5) F.	16 57 48.87	113 48 9.9
Div., Flex., etc.	. .	+ 0.13

B. A. C. 5753.

1875.	h. m. s.	° ′ ″
June 4 E.	16 57 54.67	76 12 57.1
Div., Flex., etc.	. .	− 0.34

B. A. C. 5757.

1875.	h. m. s.	° ′ ″
June 4 E.	16 58 12.97	76 15 4.6
Div., Flex., etc.	. .	− 0.34

MURAL ZONES 174, 65.

1875.	h. m. s.	° ′ ″
July 3 F.	17 0 36.63	113 30 . .
7 F.	36.52	16.2
Mean . . .	17 0 36.575	113 30 16.20
Div., Flex., etc.	. .	+ 0.12

MURAL ZONES 174, 66.

1875.	h. m. s.	° ′ ″
July 3 F.	17 0 51.14	113 25 . .
7 F.	51.04	37.5
Mean . . .	17 0 51.090	113 25 37.50
Div., Flex., etc.	. .	+ 0.12

B. A. C. 5781.

1875.	h. m. s.	° ′ ″
Aug. 26 Sk.	17 3 12.66	105 34 5.3
Div., Flex., etc.	. .	− 0.04

B. A. C. 5793.

1875.	h. m. s.	° ′ ″
Aug. 21 P.	17 4 51.18	122 17 6.3
Div., Flex., etc.	. .	+ 0.24

ANONYMOUS.

1875.	h. m. s.	° ′ ″
July 3 F.	17 5 4.28	113 28 . .
7 F.	4.24	34.5
Mean . . .	17 5 4.260	113 28 34.50
Div., Flex., etc.	. .	+ 0.12

ANONYMOUS.

1875.	h. m. s.	° ′ ″
July 7 F.	17 6 3.14	113 20 59.2
Div., Flex., etc.	. .	+ 0.11

B. A. C. 5834.

1875.	h. m. s.	° ′ ″
Aug. 9 P.	17 10 41.61	53 2 56.8
Nov. 17 P.	41.57	57.0
Dec. 20 E.	41.58	56.9
Mean . . .	17 10 41.587	53 2 56.90
Div., Flex., etc.	. .	− 0.14

ANONYMOUS.

1875.	h. m. s.	° ′ ″
July 3 F.	17 11 33.28	113 24 10.7
7 F.	33.50	6.9
Mean . . .	17 11 33.390	113 24 8.80
Div., Flex., etc.	. .	+ 0.12

ANONYMOUS.

1875.	h. m. s.	° ′ ″
July 3 F.	17 11 38.56	113 27 56.9
7 F.	38.70	51.4
Mean . . .	17 11 38.630	113 27 54.15
Div., Flex., etc.	. .	+ 0.12

XVII, 2.

1875.	h. m. s.	° ′ ″
July 14 E.	17 13 30.86	110 58 36.9
Aug. 5 E.	30.83	37.7
Mean . . .	17 13 30.845	110 58 37.30
Div., Flex., etc.	. .	0.00

MURAL ZONES 171, 9.

1875.	h. m. s.	° ′ ″
July 3 F.	17 14 30.91	113 26 53.3
7 F.	30.80	52.5
Aug. 21 (9.0) P.	30.86	52.2
Mean . . .	17 14 30.857	113 26 52.67
Div., Flex., etc.	. .	+ 0.12

ANONYMOUS.

1875.	h. m. s.	° ′ ″
July 3 F.	17 15 . .	*{ 113 5 53.2
7 F.	. .	{ 6 7.9
Div., Flex., etc.	. .	+ 0.10

* One of these is probably one revolution wrong.

XVII, 4.

1875.	h. m. s.	° ′ ″
Aug. 30 P.	17 15 50.63	124 40 17.2
Div., Flex., etc.	. .	+ 0.21

B. A. C. 5863.

1875.	h. m. s.	° ′ ″
Aug. 17 P.	17 15 59.19	57 22 15.1
Div., Flex., etc.	. .	0.00

XVII, 3.

1875.	h. m. s.	° ′ ″
Aug. 21 P.	17 16 7.42	111 35 36.9
Div., Flex., etc.	. .	+ 0.03

B. A. C. 5871.

1875.		h. m. s.	° ′ ″
Aug. 5	E.	17 16 49.35	43 38 9.6
25	P.	49.24	9.6
26	Sk.	49.12	8.8
Mean . . .		17 16 49.237	43 38 9.33
Div., Flex., etc.		. .	— 0.89

XVII, 5.

1875.		h. m. s.	° ′ ″
June 4	E.	17 18 15.82	117 28 59.8
Div., Flex., etc.		. .	+ 0.21

XVII, 7.

1875.		h. m. s.	° ′ ″
July 16 (7.0)	F.	17 23 32.98	123 36 14.1
Div., Flex., etc.		. .	+ 0.22

XVII, 8.

1875.		h. m. s.	° ′ ″
June 4	E.	17 23 47.46	113 51 48.0
Aug. 5	E.	47.42	52.0
21	P.	47.32	50.1
Mean . . .		17 23 47.400	113 51 50.03
Div., Flex., etc.		. .	+ 0.13

B. A. C. 5917.

1875.		h. m. s.	° ′ ″
Aug. 26	Sk.	17 24 4.16	29 50 48.2
Sept. 1	P.	4.47	47.3
Mean . . .		17 24 4.315	29 50 47.75
Div., Flex., etc.		. .	— 1.02

B. A. C. 5918.

1875.		h. m. s.	° ′ ″
Aug. 30	P.	17 24 12.32	31 14 37.8
Sept. 7	F.	12.58	36.1
Mean . . .		17 24 12.450	31 14 36.95
Div., Flex., etc.		. .	— 1.02

B. A. C. 5929.

1875.		h. m. s.	° ′ ″
Aug. 21	P.	17 26 29.71	51 1 24.5
Div., Flex., etc.		. .	— 0.36

B. A. C. 5950.

1875.		h. m. s.	° ′ ″
July 30	E.	17 29 42.97	34 43 42.8
Aug. 21	P.	42.92	47.5
Mean . . .		17 29 42.945	. .
Div., Flex., etc.		. .	— 1.07

XVII, 10.

1875.		h. m. s.	° ′ ″
July 16 (8.0)	F.	17 29 47.62	120 49 47.9
Div., Flex., etc.		. .	+ 0.25

B. A. C. 5951.

1875.		h. m. s.	° ′ ″
July 30	E.	17 29 48.22	34 44 33.8
Aug. 21	P.	48.23	27.9
Mean . . .		17 29 48.225	. .
Div., Flex., etc.		. .	— 1.07

B. A. C. 5962.

1875.		h. m. s.	° ′ ″
July 7 (7.0)	F.	17 31 51.41	59 8 14.0
Aug. 26	Sk.	51.12	12.8
Sept. 1	P.	51.30	10.5
Mean . . .		17 31 51.277	59 8 12.43
Div., Flex , etc.		. .	— 0.09

B. A. C. 5967.

1875.		h. m. s.	° ′ ″
Aug. 25	P.	17 32 22.10	65 36 52.5
Sept. 7	F.	22.06	51.4
Mean . . .		17 32 22.080	65 36 51.95
Div., Flex., etc.		. .	— 0.16

B. A. C. 5975.

1875.		h. m. s.	° ′ ″
July 16	F.	17 33 21.60	41 20 28.6
Aug. 30	P.	21.38	28.7
Sept. 1	P.	21.45	25.8
Mean . . .		17 33 21.477	41 20 27.70
Div., Flex., etc.		. .	— 0.92

B. A. C. 5974.

1875.		h. m. s.	° ′ ″
Sept. 8	P.	17 34 21.94	126 52 49.6
Div., Flex., etc.		. .	+ 0.28

B. A. C. 5990.

1875.		h. m. s.	° ′ ″
July 30	E.	17 35 56.27	43 55 34.9
Aug. 5	E.	56.35	35.9
Mean . . .		17 35 56.310	43 55 35.40
Div., Flex., etc.		. .	— 0.88

B. A. C 5988.

1875.		h. m. s.	° ′ ″
July 7	F.	17 35 . .	65 25 26.7
Aug. 20	P.	57.42	26.3
26	Sk.	57.21	25.2
Mean . . .		17 35 57.315	65 25 26.07
Div., Flex., etc.		. .	— 0.15

O. ARG. S. 17123.

1875.		h. m. s.	° ′ ″
Aug. 21	P.	17 36 23.69	117 23 52.8
Div., Flex., etc.		. .	+ 0.21

TRANSIT ZONES 36, 67.

1875.		h. m. s.	° ′ ″
Aug. 21	P.	17 37 16.88	117 24 12.2
Div., Flex., etc.		. .	+ 0.21

B. A. C. 5996.

1875.		h. m. s.	° ′ ″
Sept. 8	P.	17 37 18.00	85 22 43.8
Nov. 2	P.	18.03	43.8
11	E.	17.88	46.1
17	P.	17.85	43.8
Mean . . .		17 37 17.940	85 22 44.38
Div., Flex., etc.		. .	— 0.08

O. ARG. S. 17177.

1875.		h. m. s.	° ′ ″
Aug. 21	P.	17 38 40.42	117 23 9.7
Div., Flex., etc.		. .	+ 0.21

XVII, 16.

1875.		h. m. s.	° ′ ″
Sept. 1	P.	17 40 3.89	110 47 14.5
7	F.	3.90	14.6
Mean . . .		17 40 3.895	110 47 14.55
Div., Flex., etc.		. .	— 0.01

XVII, 15.

1875.		h. m. s.	° ′ ″
July 16	F.	17 40 6.01	122 37 19.2
Div., Flex., etc.		. .	+ 0.24

XVII, 18.

1875.		h. m. s.	° ′ ″
Sept. 8	P.	17 40 . .	128 56 19.6
Div., Flex., etc.		. .	+ 0.33

XVII, 19.

1875.		h. m. s.	° ′ ″
Aug. 5	E.	17 43 14.62	126 25 48.2
Div., Flex., etc.		. .	+ 0.26

B. A. C. 6033.

1875.		h. m. s.	° ′ ″
Aug 25	P.	17 43 44.99	64 20 5.4
30	P.	44.91	5.0
Mean . . .		17 43 44.950	64 20 5.20
Div., Flex., etc.		. .	— 0.13

B. A. C. 6036.

1875.		h. m. s.	° ′ ″
Sept. 1	P.	17 43 46.82	42 20 37.4
7	F.	46.87	38.1
Mean . . .		17 43 46.845	42 20 37.75
Div., Flex., etc.		. .	— 0.91

XVII, 21.

1875.		h. m. s.	° ′ ″
June 19	Sk.	17 44 32.05	124 4 50.2
Aug. 5	E.	31.98	51.1
Mean . . .		17 44 32.015	124 4 50.65
Div., Flex., etc.		. .	+ 0.22

O. ARG. N. 17522.

1875.		h. m. s.	° ′ ″
Sept. 1	P.	17 44 37.90	42 22 24.3
Div., Flex., etc.		. .	— 0.91

B. A. C. 6052.

1875.		h. m. s.	° ′ ″
July 30	E.	17 46 5.30	39 11 19.3
Div., Flex., etc.		. .	— 0.96

MURAL ZONES 27, 50.

1875.		h. m. s.	° ′ ″
Sept. 7	F.	17 50 43.21	118 44 33.5
Div., Flex., etc.		. .	+ 0.23

B. A. C. 6082.

1875.		h. m. s.	° ′ ″
Feb. 21	S.	17 51 57.89	52 43 54.2
27	Sk.	57.94	55.4
July 30	E.	57.98	55.6
Aug. 20	P.	58.19	56.3
Nov. 2	P.	58.07	53.0
11	E.	57.97	55.5
17	P.	57.86	54.5
Mean . . .		17 51 57.986	52 43 54.93
Div., Flex., etc.		. .	— 0.18

B. A. C. 6103.

1875.	h.	m.	s.	°	′	″
Sept. 7 (5.0) F.	17	56	25.38	125	54	6.5
Div., Flex., etc.			. .		+	0.24

B. A. C. 6162.

1875.	h.	m.	s.	°	′	″
July 30 E.	18	3	42.86	46	33	13.2
Aug. 5 E.			42.92			13.6
25 P.			42.82			13.7
26 Sk.			42.62			11.9
30 P.			42.77			13.3
Mean . . .	18	3	42.798	46	33	13.14
Div., Flex., etc.			. .		—	0.82

XVIII, 2.

1875.	h.	m.	s.	°	′	″
July 16 F.	18	4	45.31	120	58	28.6
29 (9.0) Sk.			45.20			27.9
Mean . . .	18	4	45.255	120	58	28.25
Div., Flex., etc.			. .		+	0.25

XVIII, 3.

1875.	h.	m.	s.	°	′	″
Sept. 7 (6.5) F.	18	4	. .	109	27	31.1
8 P.			51.59			32.0
20 P.			51.62			33.4
21 F.			51.58			32.5
Mean . . .	18	4	51.597	109	27	32.25
Div., Flex., etc.			. .		—	0.07

XVIII, 4.

1875.	h.	m.	s.	°	′	″
Sept. 7 (8.0) F.	18	5	. .	119	33	55.0
Div., Flex., etc.			. .		+	0.24

XVIII, 5.

1875.	h.	m.	s.	°	′	″
Sept. 7 (4.0) F.	18	6	. .	111	5	20.2
8 P.			17.28			19.7
20 P.			17.28			22.2
24 P.			17.37			22.6
Mean . . .	18	6	17.310	111	5	21.18
Div., Flex., etc.			. .			0.00

B. A. C. 6178.

1875.	h.	m.	s.	°	′	″
Aug. 26 Sk.	18	7	11.72	58	37	28.3
Div., Flex., etc.			. .		—	0.07

XVIII, 6.

1875.	h.	m.	s.	°	′	″
Sept. 20 P.	18	9	28.49	118	41	33.1
Div., Flex., etc.			. .		+	0.23

XVIII, 7.

1875.	h.	m.	s.	°	′	″
Sept. 8 P.	18	10	8.32	127	16	4.8
Div., Flex., etc.			. .		+	0.30

B. A. C. 6203.

1875.	h.	m.	s.	°	′	″
Aug. 26 Sk.	18	11	45.38	47	52	57.4
30 P.			45.37			58.2
Mean . . .	18	11	45.375	47	52	57.80
Div., Flex., etc.			. .		—	0.68

XVIII, 9.

1875.	h.	m.	s.	°	′	″
Sept. 8 P.	18	12	18.84	113	21	50.0
24 P.			19.01			50.6
Mean . . .	18	12	18.925	113	21	50.30
Div., Flex., etc.			. .		+	0.11

B. A. C. 6218.

1875.	h.	m.	s.	°	′	″
Aug. 30 P.	18	13	8.78	49	6	43.8
Sept. 1 P.			8.84			41.6
21 (4.0) F.			8.89			43.0
Mean . . .	18	13	8.837	49	6	42.80
Div., Flex., etc.			. .		—	0.52

Weisse (2) 395.

1875.	h.	m.	s.	°	′	″
Aug. 25 P.	18	15	7.21	69	8	. .
26 Sk.			7.09			5.5
31 F.			7.29			7.3
Sept. 1 P.			7.30			5.4
7 (9.0) F.			7.21			. .
Mean . . .	18	15	7.220	69	8	6.07
Div., Flex., etc.			. .		—	0.29

B. A. C. 6235.

1875.	h.	m.	s.	°	′	″
Aug. 30 P.	18	15	28.80	53	59	26.0
Sept. 20 P.			28.90			26.7
29 (6.0) F.			28.86			25.7
Mean . . .	18	15	28.853	53	59	26.13
Div., Flex., etc.			. .		—	0.01

Weisse (2) 415.

1875.	h.	m.	s.	°	′	″
Aug. 25 P.	18	15	45.59	69	7	20.2
26 (6.0) Sk.			45.57			17.7
Sept. 1 P.			45.62			17.7
7 (6.0) F.			45.65			16.0
Mean . . .	18	15	45.608	69	7	17.90
Div., Flex., etc.			. .		—	0.29

B. A. C. 6246.

1875.	h.	m.	s.	°	′	″
Sept. 24 P.	18	17	0.57	38	42	24.6
Oct. 2 E.			. .			24.3
7 F.			0.42			23.9
Mean . . .	18	17	0.495	38	42	24.27
Div., Flex., etc.			. .		—	0.97

B. A. C. 6245.

1875.	h.	m.	s.	°	′	″
Sept. 20 P.	18	17	17.60	72	14	6.5
21 (4.0) F.			17.62			6.8
29 (7.0) F.			17.61			6.7
Mean . . .	18	17	17.610	72	14	6.67
Div., Flex., etc.			. .		—	0.35

Weisse (2) 475.

1875.	h.	m.	s.	°	′	″
Aug. 25 P.	18	17	36.04	69	5	53.9
Sept. 1 P.			36.07			52.1
Mean . . .	18	17	36.055	69	5	53.00
Div., Flex., etc.			. .		—	0.29

B. A. C. 6298^1.

1875.	h.	m.	s.	°	′	″
Aug. 31 F.	18	24	45.77	128	48	28.6
Div., Flex., etc.			. .		+	0.33

B. A. C. 6298^2.

1875.	h.	m.	s.	°	′	″
Aug. 31 F.	18	24	45.99	128	48	51.2
Div., Flex., etc.			. .		+	0.33

O. Arg. S. 18436.

1875.	h.	m.	s.	°	′	″
Sept. 21 F.	18	29	7.19	117	49	46.5
Div., Flex., etc.			. .		+	0.22

XVIII, 15.

1875.	h.	m.	s.	°	′	″
Aug. 5 E.	18	30	9.26	122	47	9.7
20 P.			9.40			. .
Sept. 1 P.			9.43			4.8
7 F.			9.36			3.9
Mean . . .	18	30	9.362	122	47	6.13
Div., Flex., etc.			. .		+	0.23

B. A. C. 6350.

1875.	h.	m.	s.	°	′	″
Aug. 25 P.	18	31	6.58	37	44	43.6
Sept. 8 P.			6.60			42.8
20 P.			6.49			43.4
Mean . . .	18	31	6.557	37	44	43.27
Div., Flex., etc.			. .		—	0.99

B. A. C. 6349.

1875.	h.	m.	s.	°	′	″
Aug. 10 Sk.	18	31	10.64	51	12	22.1
30 P.			10.46			23.1
31 F.			10.61			23.1
Mean . . .	18	31	10.570	51	12	22.77
Div., Flex., etc.			. .		—	0.34

XVIII, 16.

1875.	h.	m.	s.	°	′	″
July 29 (7.0) Sk.	18	32	58.73	120	38	25.6
Sept. 20 P.			58.83			23.4
Mean . . .	18	32	58.780	120	38	24.50
Div., Flex., etc.			. .		+	0.25

XVIII, 17.

1875.	h.	m.	s.	°	′	″
Sept. 20 P.	18	33	55.60	115	6	6.7
24 P.			55.68			8.4
Mean . . .	18	33	55.640	115	6	7.55
Div., Flex., etc.			. .		+	0.16

B. A. C. 6365.

1875.	h.	m.	s.	°	′	″
Aug. 5 E.	18	35	58.01	51	44	55.1
25 P.			57.98			54.8
Sept. 7 F.			57.91			53.6
Mean . . .	18	35	57.967	51	44	54.50
Div., Flex., etc.			. .		—	0.29

B. A. C. 6368.

1875.	h.	m.	s.	°	′	″
Aug. 30 P.	18	36	4.69	34	52	12.7
Sept. 21 F.			5.00			11.7
27 F.			5.06			12.7
Mean . . .	18	36	4.917	34	52	12.37
Div., Flex., etc.			. .		—	1.07

XVIII, 18.

1875.	h. m. s.	° ′ ″
Sept. 24 P.	18 36 33.18	121 31 23.6
Div., Flex., etc.	. .	+ 0.25

XVIII, 19.

1875.	h. m. s.	° ′ ″
July 29 (5.8) Sk.	18 38 38.17	109 44 8.3
Sept. 24 P.	38.42	3.7
29 (7.0) F.	38.33	4.0
Mean . . .	18 38 38.307	109 44 5.33
Div., Flex., etc.	. .	− 0.07

XVIII, 20.

1875.	h. m. s.	° ′ ″
Sept. 8 P.	18 38 48.26	112 31 15.1
27 F.	48.33	14.5
Oct. 9 P.	48.43	15.1
Mean . . .	18 38 48.340	112 31 14.90
Div., Flex., etc.	. .	+ 0.08

XVIII, 21.

1875.	h. m. s.	° ′ ″
Aug. 31 F.	18 39 44.46	118 24 43.1
Sept. 7 (7.5) F.	44.41	38.3
29 F.	44.35	40.6
Mean . . .	18 39 44.407	118 24 40.67
Div., Flex., etc.	. .	+ 0.22

B. A. C. 6395.

1875.	h. m. s.	° ′ ″
Aug. 10 Sk.	18 40 12.73	34 35 11.9
30 P.	12.47	12.6
Sept. 1 P.	12.65	11.9
Mean . . .	18 40 12.617	34 35 12.13
Div., Flex., etc.	. . .	− 1.07

XVIII, 22.

1875.	h. m. s.	° ′ ″
Sept. 21 (6.5) F.	18 40 58.61	124 52 53.0
24 P.	58.68	54.9
27 F.	58.61	53.4
Mean . . .	18 40 58.633	124 52 53.77
Div., Flex., etc.	. .	+ 0.21

B. A. C. 6397.

1875.	h. m. s.	° ′ ″
Sept. 20 P.	18 41 30.03	71 57 24.0
Oct. 2 E.	30.06	23.1
5 Sk.	30.07	22.9
Mean . . .	18 41 30.053	71 57 23.33
Div., Flex., etc.	. .	− 0.34

B. A. C. 6404.

1875.	h. m. s.	° ′ ″
Sept. 1 P.	18 42 13.28	48 41 28.7
24 P.	13.38	30.5
Mean . . .	18 42 13.330	48 41 29.60
Div., Flex., etc.	. .	− 0.57

B. A. C. 6426.

1875.	h. m. s.	° ′ ″
Sept. 20 P.	18 45 6.80	57 19 49.1
Oct. 2 E.	6.87	50.1
5 Sk.	6.83	48.8
Mean . . .	18 45 6.833	57 19 49.33
Div., Flex., etc.	. .	0.00

B. A. C. 6427.

1875.	h. m. s.	° ′ ″
Sept. 29 F.	18 45 12.92	57 35 32.0
Oct. 7 F.	12.82	30.6
13 Sk.	12.95	31.6
Mean . . .	18 45 12.897	57 35 31.40
Div., Flex., etc.	. .	− 0.02

XVIII, 23.

1875.	h. m. s.	° ′ ″
Sept. 29 F.	18 46 31.94	111 30 40.1
Oct. 7 F.	31.84	37.6
Mean . . .	18 46 31.890	111 30 38.85
Div., Flex., etc.	. .	+ 0.03

B. A. C. 6438.

1875.	h. m. s.	° ′ ″
Aug. 25 P.	18 46 56.06	68 43 28.2
30 P.	56.04	28.3
Sept. 1 P.	56.20	25.1
8 P.	56.10	27.2
Mean . . .	18 46 56.100	68 43 27.20
Div., Flex., etc.	. .	− 0.28

ANONYMOUS.

1875.	h. m. s.	° ′ ″
Sept. 29 F.	18 49 1.00	119 1 15.1
Div., Flex., etc.	. .	+ 0.23

B. A. C. 6487.

1875.	h. m. s.	° ′ ″
Aug. 26 Sk.	18 53 56.96	75 6 1.9
Sept. 27 F.	. .	1.4
Mean . . .	18 53 56.960	75 6 1.65
Div., Flex.., etc.	. . .	− 0.38

B. A. C. 6491.

1875.	h. m. s.	° ′ ″
Jan. 26 E.	18 54 16.09	57 28 50.5
Feb. 11 E.	16.00	53.8
Mean . . .	18 54 16.045	57 28 52.15
Div., Flex., etc.	. .	− 0.01

B. A. C. 6489.

1875.	h. m. s.	° ′ ′
July 29 Sk.	18 54 39.20	120 3 24.7
Div., Flex., etc.	. .	+ 0.24

B. A. C. 6523.

1875.	h. m. s.	° ′ ″
Aug. 26 Sk.	18 59 58.59	130 41 17.2
Div., Flex., etc.	. .	+ 0.37

XIX, 3.

1875.	h. m. s.	° ′ ″
July 29 (8.5) Sk.	19 11 34.45	119 14 46.7
Div., Flex., etc.	. .	+ 0.23

B. A. C. 6601.

1875.	h. m. s.	° ′ ″
Aug. 25 P.	19 11 41.21	32 30 37.3
26 Sk.	41.03	37.5
30 P.	41.15	37.4
Mean . . .	19 11 41.130	32 30 37.40
Div., Flex., etc.	. .	− 1.03

B. A. C. 6599.

1875.	h. m. s.	° ′ ″
Aug. 20 P.	19 12 1.75	52 5 19.5
31 F.	1.84	17.8
Mean . . .	19 12 1.795	52 5 18.65
Div., Flex., etc.	. .	− 0.26

B. A. C. 6594.

1875.	h. m. s.	° ′ ″
Sept. 8 P.	19 12 23.71	122 2 45.4
20 P.	23.60	44.4
27 F.	. .	45.7
Oct. 7 (6.0) F.	23.74	43.9
Mean . . .	19 12 23.683	122 2 44.85
Div., Flex., etc.	. .	+ 0.25

B. A. C. 6622.

1875.	h. m. s.	° ′ ″
Sept. 8 P.	19 15 13.17	130 50 54.3
20 P.	13.13	52.7
21 (5.0) F.	13.27	55.6
Mean . . .	19 15 13.190	130 50 54.20
Div., Flex., etc.	. .	+ 0.37

B. A. C. 6659.

1875.	h. m. s.	° ′ ″
July 29 Sk.	19 20 7.18	39 58 23.3
Div., Flex., etc.	. .	− 0.94

B. A. C. 6680.

1875.	h. m. s.	° ′ ″
Sept. 7 F.	19 24 31.13	121 7 49.8
8 P.	31.08	50.5
21 (7.0) F.	30.95	49.2
27 F.	31.09	50.4
Mean . . .	19 24 31.062	121 7 49.98
Div., Flex., etc.	. .	+ 0.25

B. A. C. 6684.

1875.	h. m. s.	° ′ ″
Sept. 21 (7.0) F.	19 25 7.88	120 37 32.2
Oct. 9 P.	7.88	32.7
Mean . . .	19 25 7.880	120 37 32.45
Div., Flex., etc.	. .	+ 0.25

B. A. C. 6690.

1875.	h. m. s.	° ′ ″
Feb. 4 F.	19 25 40.78	62 18 5.2
11 E.	40.85	7.2
25 S.	40.79	3.8
Aug. 31 F.	40.79	8.0
Nov. 17 P.	40.78	5.3
Mean . . .	19 25 40.798	62 18 5.90
Div., Flex., etc.	. .	− 0.07

B. A. C. 6693.

1875.	h. m. s.	° ′ ″
Sept. 24 P.	19 27 5.80	121 52 36.1
Div., Flex., etc.	. .	+ 0.25

ANONYMOUS.

1875.	h. m. s.	° ′ ″
Sept. 8 P.	19 27 48.72	116 40 10.0
20 P.	48.62	9.5
27 F.	48.71	14.0
29 (9.0) F.	48.80	11.9
Mean . . .	19 27 48.712	116 40 11.35
Div., Flex., etc.	. .	+ 0.19

Mural Zones 176, 77.

1875.	h. m. s.	° ′ ″
Aug. 20 P.	19 28 12.73	116 34 24.2
Sept. 1 P.	12.86	21.3
7 F.	12.87	. .
8 P.	12.93	22.0
27 F.	12.97	22.7
Mean . . .	19 28 12.872	116 34 22.55
Div., Flex., etc.	. .	+ 0.19

Mural Zones 176, 78.

1875.	h. m. s.	° ′ ″
Aug. 20 P.	19 28 51.27	116 35 42.3
Sept. 1 P.	51.35	41.2
7 F.	51.37	40.2
8 P.	51.42	41.0
27 F.	51.51	41.6
Mean . . .	19 28 51.384	116 35 41.26
Div., Flex., etc.	. .	+ 0.19

Anonymous.

1875.	h. m. s.	° ′ ″
Sept. 20 P.	19 30 25.69	116 42 31.3*
Div., Flex., etc.	. .	+ 0.19

* Micrometer revolutions are uncertain.

B. A. C. 6718.

1875.	h. m. s.	° ′ ″
Aug. 25 P.	19 30 36.71	47 51 38.9
26 Sk.	36.60	38.5
Mean . . .	19 30 36.655	47 51 38.70
Div., Flex., etc.	. .	− 0.68

Mural Zones 119, 60.

1875.	h. m. s.	° ′ ″
Sept. 21 (9.0) F.	19 30 39.21	117 38 16.1
Oct. 2 E.	39.10	17.1
Mean . . .	19 30 39.155	117 38 16.60
Div., Flex., etc.	. .	+ 0.21

Anonymous.

1875.	h m. s.	° ′ ″
Sept. 20 P.	19 30 45.15	116 38 36.0
Div., Flex., etc.	. .	+ 0.19

B. A. C. 6721.

1875.	h. m. s.	° ′ ″
Aug. 30 P.	19 31 6.51	42 6 28.0
Sept. 4 P.	6.72	29.3
Mean . . .	19 31 6.615	42 6 28.65
Div., Flex., etc.	. .	− 0.91

O. Arg. S. 19809.

1875.	h. m. s.	° ′ ″
Sept. 21 (8.5) F.	19 31 12.59	117 39 6.0
Oct. 2 E.	12.62	6.1
Mean . . .	19 31 12.605	117 39 6.05
Div., Flex., etc.	. .	+ 0.21

XIX, 10.

1875.	h. m. s.	° ′ ″
Aug. 21 P.	19 31 34.84	122 45 17.2
Div., Flex., etc.	. .	+ 0.23

B. A. C. 6724.

1875.	h. m. s.	° ′ ″
Aug. 25 P.	19 31 37.93	73 49 1.1
26 Sk.	37.85	0.3
Mean . . .	19 31 37.890	73 49 0.70
Div., Flex., etc.	. .	− 0.39

Anonymous.

1875.	h. m. s.	° ′ ″
July 29 (9.0) Sk.	19 32 12.86	122 45 38.2
Div., Flex., etc.	. .	+ 0.23

B. A. C. 6731.

1875.	h. m. s.	° ′ ″
Aug. 5 E.	19 32 45.59	45 34 53.5
Div., Flex., etc.	. .	− 0.86

B. A. C. 6753.

1875.	h. m. s.	° ′ ″
Sept. 24 P.	19 37 29.27	121 12 3.2
Div., Flex., etc.	. .	+ 0.25

B. A. C. 6762.

1875.	h. m. s.	° ′ ″
Aug. 5 E.	19 38 48.64	63 9 46.3
21 P.	48.75	45.3
Mean . . .	19 38 48.695	63 9 45.8
Div., Flex., etc.	. .	− 0.09

XIX, 12.

1875.	h. m. s.	° ′ ″
Sept. 1 P.	19 40 5.23	112 7 56.6
4 P.	5.33	58.3
7 F.	5.25	56.1
Mean . . .	19 40 5.270	112 7 57.00
Div., Flex., etc.	. .	+ 0.06

B. A. C. 6780.

1875.	h. m. s.	° ′ ″
Aug. 25 P.	19 40 48.27	32 16 53.7
Div., Flex., etc.	. .	− 1.03

B. A. C. 6784.

1875.	h. m. s.	° ′ ″
Aug. 26 Sk.	19 41 40.80	56 33 45.5
30 P.	40.71	44.4
Mean . . .	19 41 40.755	56 33 44.95
Div., Flex., etc.	. .	+ 0.06

B. A. C. 6790.

1875.	h. m. s.	° ′ ″
Sept. 8 P.	19 43 21.01	130 11 20.1
Div., Flex., etc.	. .	+ 0.36

B. A. C. 6794.

1875.	h. m. s.	° ′ ″
Aug. 25 P.	19 43 25.74	71 10 13.8
26 Sk.	25.75	14.2
30 P.	25.69	13.3
Mean . . .	19 43 25.727	71 10 13.77
Div., Flex., etc.	. .	− 0.33

XIX, 13.

1875.	h. m. s.	° ′ ″
July 29 (8.8) Sk.	19 43 35.30	128 43 3.9
Aug. 31 F.	35.84	5.3
Sept. 1 P.	35.59	3.7
Mean . . .	19 43 35.577	128 43 4.30
Div., Flex., etc.	. .	+ 0.32

B. A. C. 6806.

1875.	h. m. s.	° ′ ″
Aug. 21 P.	19 45 2.24	51 36 14.0
Div., Flex., etc.	. .	− 0.31

B. A. C. 6817.

1875.	h. m. s.	° ′ ″
Sept. 1 P.	19 46 19.91	49 43 1.6
4 P.	20.03	3.8
7 (4.0) F.	19.80	2.9
8 P.	19.84	2.4
Mean . . .	19 46 19.895	49 43 2.68
Div., Flex., etc.	. .	− 0.46

XIX, 14.

1875.	h. m. s.	° ′ ″
July 29 (5.0) Sk.	19 46 48.49	114 14 59.5
Div., Flex., etc.	. .	+ 0.14

B. A. C. 6827.

1875.	h. m. s.	° ′ ″
Aug. 25 P.	19 48 8.93	66 14 45.0
26 Sk.	8.78	44.0
30 P.	8.78	44.5
Mean . . .	19 48 8.830	66 14 44.50
Div., Flex., etc.	. .	− 0.16

XIX, 15.

1875.	h. m. s.	° ′ ″
Sept. 4 P.	19 49 16.58	117 29 59.7
8 P.	16.54	55.3
24 P.	16.58	56.2
27 F.	16.45	58.5
29 (6.5) F.	16.59	59.1
Mean . . .	19 49 16.548	117 29 57.76
Div., Flex., etc.	. .	+ 0.21

B. A. C. 6839.

1875.	h. m. s.	° ′ ″
Aug. 25 P.	19 50 20.58	73 41 43.2
26 Sk.	20.45	43.3
Sept. 7 (5.5) F.	20.57	41.5
Mean . . .	19 50 20.533	73 41 42.67
Div., Flex., etc.	. .	− 0.39

XIX, 16.

1875.	h. m. s.	° ′ ″
Aug. 20 P.	19 51 4.42	120 52 17.3
Sept. 24 P.	4.46	15.9
27 F.	4.42	16.8
29 F.	4.51	15.9
Oct. 7 F.	4.38	16.5
Mean . . .	19 51 4.438	120 52 16.48
Div., Flex., etc.	. .	+ 0.25

B. A. C. 6849.

1875.	h. m. s.	° ′ ″
Sept. 4 P.	19 51 23.77	51 50 41.8
Oct. 2 E.	23.66	42.6
5 Sk.	23.80	41.0
Mean . . .	19 51 23.743	51 50 41.80
Div., Flex., etc.	. .	− 0.28

B. A. C. 6851.

1875.		h. m. s.	° ′ ″
Aug. 30	P.	19 51 36.82	55 14 53.0
Oct. 13	Sk.	36.92	51.7
21	F.	36.97	50.5
Mean . . .		19 51 36.903	55 14 51.73
Div., Flex., etc.		. .	+ 0.07

XIX, 17.

1875.		h. m. s.	° ′ ″
Oct. 9	P.	19 51 44.27	125 1 55.6
12	F.	(43.97)	57.2
20	P.	44.20	. .
21	F.	44.28	56.4
Mean . . .		19 51 44.250	125 1 56.40
Div., Flex., etc.		. .	+ 0.21

B. A. C. 6863.

1875.		h. m. s.	° ′ ″
Oct. 9	P.	19 52 53.08	32 4 48.3
12	F.	. .	49.9
13	Sk.	52.96	47.8
21	F.	53.28	47.8
Mean . . .		19 52 53.107	32 4 48.45
Div., Flex., etc.		. .	— 1.02

B. A. C. 6857.

1875.		h. m. s.	° ′ ″
Sept. 1	P.	19 52 53.34	49 58 1.4
21 (6.0)	F.	53.40	2.6
Oct. 2	E.	53.42	4.2
Mean . . .		19 52 53.387	49 58 2.73
Div., Flex., etc.		. .	— 0.44

B. A. C. 6860.

1875.		h. m. s.	° ′ ″
Sept. 8	P.	19 53 0.45	51 52 39.3
24	P.	0.35	39.2
Oct. 5	Sk.	0.42	39.2
20	P.	0.39	39.0
Mean . . .		19 53 0.402	51 52 39.18
Div., Flex., etc.		. .	— 0.28

Bonn VI, + 38°, 3836.

1875.		h. m. s.	° ′ ″
Sept. 8	P.	19 53 10.41	51 56 4.7
Oct. 20	P.	10.61	5.3
Mean . . .		19 53 10.510	51 56 5.00
Div., Flex., etc.		. .	— 0.28

B. A. C. 6879.

1875.		h. m. s.	° ′ ″
Aug. 20	P.	19 55 57.13	62 35 . .
21	P.	57.30	27.1
Mean . . .		19 55 57.215	62 35 27.10
Div., Flex., etc.		. .	— 0.08

B. A. C. 6877.

1875.		h. m. s.	° ′ ″
Sept. 14	P.	19 56 23.80	122 24 17.7
20	P.	23.75	18.4
Mean . . .		19 56 23.775	122 24 18.05
Div., Flex., etc.		. .	+ 0.24

B. A. C. 6882.

1875.		h. m. s.	° ′ ″
Aug. 5	E.	19 56 26.83	65 32 43.6
25	P.	26.87	44.6
26	Sk.	26.91	44.4
Mean . . .		19 56 26.870	65 32 44.20
Div., Flex., etc.		. .	— 0.16

B. A. C. 6886.

1875.		h. m. s.	° ′ ″
Sept. 4	P.	19 57 33.65	123 21 8.6
20	P.	33.48	6.2
29 (6.5)	F.	33.69	6.0
Mean . . .		19 57 33.607	123 21 6.93
Div., Flex., etc.		. .	+ 0.23

B. A. C. 6895.

1875.		h. m. s.	° ′ ″
Aug. 25	P.	19 57 49.35	40 14 34.4
26	Sk.	49.18	33.6
Mean . . .		19 57 49.265	40 14 34.00
Div., Flex., etc.		. .	— 0.94

B. A. C. 6922.

1875.		h. m. s.	° ′ ″
Sept. 4	P.	20 2 59.06	126 24 53.2
8	P.	58.97	48.1
14	P.	58.93	47.8
29	F.	58.90	48.4
Mean . . .		20 2 58.965	126 24 49.38
Div., Flex., etc.		. .	+ 0.26

B. A. C. 6934.

1875.		h. m. s.	° ′ ″
Feb. 25	S.	20 4 51.46	91 11 24.7
Aug. 21	P.	51.36	27.5
Sept. 8	P.	51.39	27.2
20	P.	51.26	27.2
29	F.	. .	27.3
Mean . . .		20 4 51.368	91 11 26.78
Div., Flex., etc.		. .	— 0.02

B. A. C. 6948.

1875.		h. m. s.	° ′ ″
Aug. 21	P.	20 8 4.54	120 23 4.0
Sept. 1	P.	4.64	4.5
14	P.	4.49	3.7
Mean . . .		20 8 4.557	120 23 4.07
Div., Flex., etc.		. .	+ 0.24

B. A. C. 6983.

1875.		h. m. s.	° ′ ″
Aug. 20	P.	20 10 51.08	42 40 22.0
Div., Flex., etc.		. .	— 0.90

B. A. C. 6977.

1875.		h. m. s.	° ′ ″
Sept. 4	P.	20 11 39.89	120 0 44.1
7	F.	39.74	41.9
8	P.	39.83	43.0
Mean . . .		20 11 39.820	120 0 43.00
Div., Flex., etc.		. .	+ 0.24

XX, 5.

1875.		h. m. s.	° ′ ″
Aug. 31	F.	20 12 13.59	124 58 24.9
Sept. 1	P.	13.84	23.8
Mean . . .		20 12 13.715	124 58 24.35
Div., Flex., etc.		. .	+ 0.21

B. A. C. 6986.

1875.		h. m. s.	° ′ ″
Aug. 25	P.	20 12 28.42	50 1 16.2
26	Sk.	28.26	15.9
Mean . . .		20 12 28.340	50 1 16.05
Div., Flex., etc.		. .	— 0.44

B. A. C. 6990.

1875.		h. m. s.	° ′ ″
Aug. 21	P.	20 13 10.92	52 21 17.2
Div., Flex., etc.		. .	— 0.23

B. A. C. 6998.

1875.		h. m. s.	° ′ ″
Aug. 26	Sk.	20 13 51.00	55 24 25.9
30	P.	50.92	25.7
31	F.	50.88	26.0
Sept. 1	P.	50.86	24.0
Mean . . .		20 13 50.915	55 24 25.40
Div., Flex., etc.		. .	+ 0.08

B. A. C. 7001.

1875.		h. m. s.	° ′ ″
Aug. 25	P.	20 14 24.53	51 23 12.5
Div., Flex., etc.		. .	— 0.33

Weisse (2) 538.

1875.		h. m. s.	° ′ ″
Sept. 14	P.	20 15 53.51	70 41 28.4
Div., Flex., etc.		. .	— 0.32

B. A. C. 7022.

1875.		h. m. s.	° ′ ″
Jan. 31	F.	20 17 44.65	50 8 34.4
Feb. 4	F.	44.49	34.4
11	E.	44.64	34.3
15	E.	44.48	33.2
21	S.	44.57	32.5
25	S.	44.42	32.0
Mar. 7	E.	44.35	34.6
9	F.	44.47	36.5
11	E.	44.58	32.8
Aug. 20	P.	44.55	35.1
Sept. 7	F.	44.42	34.6
8	P.	44.57	33.5
Mean . . .		20 17 44.516	50 8 33.99
Div., Flex., etc.		. .	— 0.43

B. A. C. 7025.

1875.		h. m. s.	° ′ ″
Sept. 4	P.	20 18 46.81	127 48 17.9
20	P.	46.77	18.0
29 (7.0)	F.	46.86	19.2
Mean . . .		20 18 46.813	127 48 18.37
Div., Flex., etc.		. .	+ 0.31

B. A. C. 7036.

1875.		h. m. s.	° ′ ″
Sept. 14	P.	20 20 45.23	126 0 20.9
24	P.	45.30	23.1
29 (6.5)	F.	45.33	20.3
Mean . . .		20 20 45.287	126 0 21.43
Div., Flex., etc.		. .	+ 0.24

O. Arg. S. 20578.

1875.	h. m. s.	° ′ ″
Aug. 30 P.	20 24 52.39	115 17 27.8
Sept. 4 P.	52.46	28.2
7 F.	52.41	26.8
Mean . . .	20 24 52.420	115 17 27.60
Div., Flex., etc.	. .	+ 0.17

B. A. C. 7077.

1875.	h. m. s.	° ′ ″
Aug. 20 P.	20 25 25.71	115 21 51.2
21 P.	25.74	51.1
25 P.	25.85	51.4
Mean . . .	20 25 25.767	115 21 51.23
Div., Flex., etc.	. .	+ 0.17

Anonymous.

1875.	h. m. s.	° ′ ″
Aug. 20 P.	20 25 41.79	115 24 45.7
21 P.	41.86	45.7
25 P.	41.94	46.0
Mean . . .	20 25 41.863	115 24 45.80
Div., Flex., etc.	. .	+ 0.17

O. Arg. S. 20601.

1875.	h. m. s.	° ′ ″
Aug. 30 P.	20 26 24.65	115 5 1.1
Sept. 4 P.	24.66	0.3
8 P.	24.58	0.4
Mean . . .	20 26 24.630	115 5 0.60
Div., Flex., etc.	. .	+ 0.16

Anonymous.

1875.	h. m. s.	° ′ ″
Aug. 21 P.	20 26 45.67	115 27 56.3
25 P.	45.82	55.8
Mean . . .	20 26 45.745	115 27 56.05
Div., Flex., etc.	. .	+ 0.17

Anonymous.

1875.	h. m. s.	° ′ ″
Aug. 20 P.	20 27 21.07	115 25 31.0
21 P.	21.16	. .
Mean . . .	20 27 21.115	115 25 31.00
Div., Flex., etc.	. .	+ 0.17

Mural Zones 64, 16.

1875.	h. m. s.	° ′ ″
Aug. 30 P.	20 28 24.62	114 48 10.5
Sept. 8 P.	24.60	9.1
14 P.	24.63	9.5
Mean . . .	20 28 24.617	114 48 9.70
Div., Flex., etc.	. .	+ 0.16

B. A. C. 7149.

1875.	h. m. s.	° ′ ″
Feb. 4 F.	20 33 50.00	74 31 41.1
Sept. 1 P.	49.85	38.4
7 (5.0) F.	49.96	40.8
14 P.	49.90	40.1
Mean . . .	20 33 49.928	74 31 40.10
Div., Flex., etc.	. .	− 0.39

B. A. C. 7155.

1875.	h. m. s.	° ′ ″
Sept. 4 P.	20 34 41.62	130 0 16.1
14 P.	41.51	10.7
20 P.	41.46	13.9
Mean . . .	20 34 41.530	130 0 13.57
Div., Flex., etc.	. .	+ 0 36

B. A. C. 7175.

1875.	h. m. s.	° ′ ″
Aug. 20 P.	20 38 11.05	129 39 3.6
Sept. 1 P.	10.87	4.2
8 P.	10.94	4.2
Mean . . .	20 38 10.953	129 39 4.00
Div., Flex., etc.	. .	+ 0.35

B. A. C. 7204.

1875.	h. m. s.	° ′ ″
Sept. 7 (3.0) F.	20 41 9.18	56 29 (41.7)
20 P.	9.23	49.6
24 P.	9.26	49.6
29 (3.0) F.	9.14	49.3
Mean . . .	20 41 9.202	56 29 49.50
Div., Flex., etc.	. .	+ 0.06

B. A. C. 7215.

1875.	h. m. s.	° ′ ″
Sept. 1 P.	20 42 14.70	32 52 6.2
3 F.	15.01	8.0
4 P.	14.97	7.6
Mean . . .	20 42 14.893	32 52 7.27
Div., Flex., etc.	. .	− 1.04

B. A. C. 7213.

1875.	h. m. s.	° ′ ″
Aug. 21 P.	20 42 32.52	53 58 4.7
Div., Flex., etc.	. .	− 0.01

B. A. C. 7218.

1875.	h. m. s.	° ′ ″
Aug. 25 P.	20 42 43.84	37 27 32.9
Sept. 8 P.	43.70	33.8
14 P.	43.70	32.4
Mean . . .	20 42 43.747	37 27 33.03
Div., Flex., etc.	. .	− 0.99

B. A. C. 7212.

1875.	h. m. s.	° ′ ″
Sept. 20 P.	20 42 58.57	128 22 35.8
Oct. 5 (7.0) Sk.	58.74	34.8
13 (6.0) Sk.	58.80	37.0
Mean . . .	20 42 58.703	128 22 35.87
Div., Flex., etc.	. .	+ 0.32

XX, 15.

1875.	h. m. s.	° ′ ″
Aug. 26 Sk.	20 43 47.02	116 2 52.1
Sept. 1 P.	46.96	50.1
Mean . . .	20 43 46.990	116 2 51.10
Div., Flex., etc.	. .	+ 0.18

XX, 16.

1875.	h. m. s.	° ′ ″
Aug. 21 P.	20 44 5.03	118 27 39.6
Div., Flex., etc.	. .	+ 0.22

B. A. C. 7226.

1875.	h. m. s.	° ′ ″
Sept. 24 P.	20 44 12.69	123 38 38.3
Nov. 12 P.	12.68	40.8
13 F.	12.66	39.2
Mean . . .	20 44 12.677	123 38 39.43
Div., Flex., etc.	. .	+ 0.22

XX, 17.

1875.	h. m. s.	° ′ ″
Aug. 30 P.	20 44 35.60	121 9 48.7
Div., Flex., etc.	. .	+ 0.25

B. A. C. 7234.

1875.	h. m. s.	° ′ ″
Sept. 20 P.	20 45 31.71	130 16 33.6
Oct. 5 (6.8) Sk.	31.84	34.9
13 (6.5) Sk.	31.79	34.6
Mean . . .	20 45 31.780	130 16 34.37
Div., Flex., etc.	. .	+ 0.36

B. A. C. 7244.

1875.	h. m. s.	° ′ ″
Aug. 25 P.	20 45 38.64	46 24 39.7
Div., Flex., etc.	. .	− 0.83

B. A. C. 7237.

1875.	h. m. s.	° ′ ″
Sept. 3 F.	20 45 41.17	114 15 0.5
4 P.	41.21	1.5
8 P.	41.19	0.1
Mean . . .	20 45 41.190	114 15 0.70
Div., Flex., etc.	. .	+ 0.15

Mural Zones 40, 29.

1875.	h. m. s.	° ′ ″
Aug. 30 P.	20 45 46.56	121 11 . .
31 F.	46.48	18.7
Mean . . .	20 45 46.520	121 11 18.7
Div., Flex., etc.	. .	+ 0.25

B. A. C. 7280.

1875.	h. m. s.	° ′ ″
Aug. 20 P.	20 53 37.14	122 44 41.3
Sept. 1 (6.0) F.	37.22	40.8
4 P.	37.23	41.8
Mean . . .	20 53 37.197	122 44 41.30
Div., Flex., etc.	. .	+ 0.24

B. A. C. 7286.

1875.	h. m. s.	° ′ ″
Sept. 1 P.	20 54 25.86	129 0 52.6
7 (5.0) F.	25.76	50.9
8 P.	25.93	51.1
Mean . . .	20 54 25 850	129 0 51.53
Div., Flex., etc.	. .	+ 0.33

B. A. C. 7292.

1875.	h. m. s.	° ′ ″
Sept. 1 P.	20 54 58.43	129 7 4.5
7 (5.0) F.	58.41	2.9
8 P.	58.42	4.2
Mean . . .	20 54 58.420	129 7 3.87
Div., Flex., etc.	. .	+ 0.33

B. A. C. 7316.

1875.		h.	m.	s.	°	′	″
Aug. 25	P.	20	58	28.10	120	37	11.7
Sept. 1 (6.5)	F.			28.05			11.5
4	P.			28.14			13.9
Mean . . .		20	58	28.097	120	37	12.37
Div., Flex., etc.				. .		+	0.25

B. A. C. 7349.

1875.		h.	m.	s.	°	′	″
Sept. 14	P.	21	4	11.66	130	46	16.1
Oct 7	F.			11.70			14.3
13	Sk.			11.72			18.5
Mean . . .		21	4	11.693	130	46	16.30
Div., Flex., etc.				. .		+	0.37

B. A. C. 7353.

1875.		h.	m.	s.	°	′	″
Sept. 1	P.	21	5	2.71	129	55	58.4
3 (6.0)	F.			2.74		55	57.5
4	P.			2.86		56	0.9
7 (4.0)	F.			2.83		55	55.7
Mean . . .		21	5	2.785	129	55	58.12
Div., Flex., etc.				. .		+	0.36

MURAL ZONES 187, 66.

1875.		h.	m.	s.	°	′	″
Aug. 20	P.	21	6	51.42	110	36	8.9
Sept. 20	P.			51.47			9.1
Oct. 5	Sk.			51.56			9.3
Mean . . .		21	6	51.483	110	36	9.10
Div., Flex., etc.				. .		—	0.02

ANONYMOUS.

1875.		h.	m.	s.	°	′	″
Aug. 30	P.	21	7	41.72	112	20	13.1
Sept. 1	P.			. .			11.0
4	P.			41.75			13.5
Mean . . .		21	7	41.735	112	20	12.53
Div., Flex., etc.				. .		+	0.07

O. ARG. S. 21237.

1875.		h.	m.	s.	°	′	″
Aug. 20	P.	21	7	51.08	110	35	13.3
Sept. 20	P.			51.11			12.9
Oct. 5	Sk.			51.19			14.1
Mean . . .		21	7	51.127	110	35	13.42
Div., Flex., etc.				. .		—	0.02

TRANSIT ZONES 176, 4.

1875.		h.	m.	s.	°	′	″
Aug. 30	P.	21	7	. .	112	19	52.6
Sept. 1	P.			53.34			52.8
4	P.			53.46			53.8
Oct. 7	F.			53.28			50.1
20	P.			53.41			52.0
Nov. 2	P.			53.34			52.5
Mean . . .		21	7	53.366	112	19	52.30
Div., Flex., etc.				. .		+	0.07

TRANSIT ZONES 182, 75.

1875.		h.	m.	s.	°	′	″
Sept. 8	P.	21	8	5.82	111	48	40.4
14	P.			5.79			40.5
Oct. 27	F.			. .			41.7
Nov. 5	P.			5.77			40.9
Mean . . .		21	8	5.793	111	48	40.88
Div , Flex., etc.				. .		+	0.04

O. ARG. S. 21249.

1875.		h.	m.	s.	°	′	″
Sept. 8	P.	21	8	43.73	111	57	26.0
14	P.			43.76			24.9
Oct. 27	F.			. .			25.8
Nov. 2	P.			43.72			26.8
Mean . . .		21	8	43.737	111	57	25.88
Div., Flex., etc.				. .		+	0.05

B. A. C. 7398.

1875.		h.	m.	s.	°	′	″
Aug. 9	P.	21	12	30.42	51	7	42.1
Sept. 7 (4.0)	F.			30.38			43.2
Nov. 6	Sk.			30.31			43.1
Mean . . .		21	12	30.370	51	7	42.80
Div., Flex., etc.				. .		—	0.35

B. A. C. 7399.

1875.		h.	m.	s.	°	′	″
Sept. 8	P.	21	12	46.81	55	37	37.7
Oct. 13	Sk.			46.61			38.1
Nov. 5	P.			46.81			37.7
Mean . . .		21	12	46.743	55	37	37.83
Div., Flex., etc.				. .		+	0.09

B. A. C. 7447.

1875.		h.	m.	s.	°	′	″
Aug. 20	P.	21	20	9.44	111	44	8.3
30	P.			9.50			8.0
Sept. 7 (4.0)	F.			9.45			7.2
Mean . . .		21	20	9.463	111	44	7.83
Div., Flex., etc.				. .		+	0.04

B. A. C. 7458.

1875.		h.	m.	s.	°	′	″
Sept. 3 (7.0)	F.	21	21	35.42	121	46	55.9
4	P.			35.44			53.1
7 (5.0)	F.			. .			52.2
Mean . . .		21	21	35.430	121	46	53.77
Div., Flex., etc.				. .		+	0.25

B. A. C. 7475.

1875.		h.	m.	s.	°	′	″
Aug. 20	P.	21	24	40.68	124	29	38.6
Sept. 4	P.			40.73			38.5
8	P.			40.67			39.4
Mean . . .		21	24	40.693	124	29	38.83
Div., Flex., etc.				. .		+	0.22

B. A. C. 7502.

1875.		h.	m.	s.	°	′	″
Aug. 9	P.	21	29	18.20	123	36	21.5
20	P.			18.12			22.0
Sept. 1	P.			18.11			19.9
4	P.			18.24			21.4
7 (6.0)	F.			18.18			20.1
Mean . . .		21	29	18.170	123	36	20.98
Div., Flex., etc.				. .		+	0.22

XXI, 13.

1875.		h.	m.	s.	°	′	″
Oct. 7	F.	21	31	50.16	110	11	10.9
Div., Flex., etc.				. .		—	0.05

XXI, 16.

1875.		h.	m.	s.	°	′	″
Sept. 3 (7.5)	F.	21	38	. .	113	8	8.0
4	P.			0.88			9.6
Mean . . .		21	38	0.88	113	8	8.80
Div., Flex., etc.				. .		+	0.11

B. A. C. 7613.

1875.		h.	m.	s.	°	′	″
Sept. 7 (2.5)	F.	21	46	21.23	127	57	5.8
8	P.			21.28			6.3
14	P.			21.24			6.4
Mean . . .		21	46	21.250	127	57	6.17
Div., Flex., etc.				. .		+	0.31

B. A. C. 7632.

1875.		h.	m.	s.	°	′	″
Sept. 8	P.	21	48	51.09	127	50	41.5
24	P.			51.08			41.0
Oct. 13	Sk.			51.11			42.5
Mean . . .		21	48	51.093	127	50	41.67
Div., Flex., etc.				. .		+	0.31

B. A. C. 7635.

1875.		h.	m.	s.	°	′	″
Aug. 21	P.	21	49	29.17	128	20	23.9
Sept. 14	P.			29.13			22.2
24	P.			29.19			21.3
Mean . . .		21	49	29.163	128	20	22.47
Div., Flex., etc.				. .		+	0.32

B. A. C. 7647.

1875.		h.	m.	s.	°	′	″
Aug. 20	P.	21	51	44.09	128	59	27.8
Sept. 7 (5.5)	F.			44.03			31.0
8	P.			44.04			28.1
Mean . . .		21	51	44.053	128	59	28.97
Div., Flex., etc.				. .		+	0.33

B. A. C. 7673.

1875.		h.	m.	s.	°	′	″
Sept. 7	F.	21	57	11.21	120	31	14.0
8	P.			11.32			14.9
14	P.			11.26			14.7
Mean . . .		21	57	11.263	120	31	14.53
Div., Flex., etc.				. .		+	0.25

B. A. C. 7684.

1875.		h.	m.	s.	°	′	″
Sept. 24	P.	21	58	34.51	130	8	44.2
Oct. 13 (5.0)	Sk.			34.43			44.4
Nov. 5	P.			34.37			45.9
Mean . . .		21	58	34.470	130	8	44.83
Div., Flex., etc.				. .		+	0.36

ANONYMOUS.

1875.		h.	m.	s.	°	′	″
Sept. 8	P.	21	59	23.31	107	32	24.8
14	P.			23.19			24.3
Oct. 2	E.			23.28			26.1
Mean . . .		21	59	23.260	107	32	25.07
Div., Flex., etc.				. .		—	0.07

ANONYMOUS.

1875.		h.	m.	s.	°	′	″
Aug. 20	P.	21	59	45.68	107	15	34.1
25	P.			45.83			33.9
Sept. 27	F.			45.96			34.6
Mean . . .		21	59	35.823	107	15	34.20
Div., Flex., etc.				. .		—	0.07

B. A. C. 7701.

1875.		h. m. s.	° ′ ″
Oct. 13 (5.5)	Sk.	22 1 5.31	123 35 50.0
Nov. 6	Sk.	5.29	50.7
8	F.	. .	48.2
Mean . . .		22 5 5.300	123 35 49.63
Div., Flex., etc.		. .	+ 0.22

B. A. C. 7702.

1875.		h. m. s.	° ′ ″
Nov. 11	E.	22 1 6.66	124 39 10.4
13	F.	6.70	8.9
27	F.	6 86	4.7
Mean . . .		22 1 6.740	124 39 8.00
Div., Flex., etc.		. .	+ 0.21

ANONYMOUS.

1875.		h. m. s.	° ′ ″
Aug. 20	P.	22 1 18.53	107 17 58.5
25	P.	18.67	58.9
Mean . . .		22 1 18.600	107 17 58.70
Div., Flex., etc.		. .	− 0.07

MURAL ZONES 207, 63.

1875.		h. m. s.	° ′ ″
Sept. 24	P.	22 1 37.48	107 9 14.6
Oct. 12	F.	37.55	11.9
27	F.	37.51	14.5
Nov. 2	P.	37.56	13.1
Mean . . .		22 1 37.525	107 9 13.52
Div., Flex., etc.		. .	− 0.07

ANONYMOUS.

1875.		h. m. s.	° ′ ″
Sept. 24	P.	22 1 43.34	107 13 20.6
27	F.	43.30	21.8
Mean . . .		22 1 43.320	107 13 21.20
Div., Flex., etc.		. .	− 0.07

LACAILLE 9036.

1875.		h. m. s.	° ′ ″
Nov. 11	E.	22 2 37.29	124 37 44.6
13	F.	37.41	42.6
27	F.	37.44	37.9
Mean . . .		22 2 37.380	124 37 41.70
Div., Flex., etc.		. .	+ 0.21

B. A. C. 7714.

1875.		h. m. s.	° ′ ″
Aug. 9	P.	22 2 49.08	123 9 41.3
Oct. 2	E.	49.19	41.9
Nov. 5	P.	49.05	40.9
Mean . . .		22 2 49.107	123 9 41.37
Div., Flex., etc.		. .	+ 0.23

B. A. C. 7742.

1875.		h. m. s.	° ′ ″
Aug. 21	P.	22 5 49.21	74 34 29.9
Div., Flex., etc.		. .	− 0.39

B. A. C. 7749.

1875.		h. m. s.	° ′ ″
Aug. 25	P.	22 6 31.19	32 24 52.4
Div., Flex., etc.		. .	− 1.03

MURAL ZONES 207, 70.

1875.		h. m. s.	° ′ ″
Sept. 14	P.	22 10 36.14	106 39 40.0
20	P.	36.19	40.4
24	P.	36.20	40.2
27	F.	36.25	41.7
Oct. 5	Sk.	36.12	40.8
Mean . . .		22 10 36.180	106 39 40.62
Div., Flex., etc.		. .	− 0.06

MURAL ZONES 207, 71.

1875.		h. m. s.	° ′ ″
Sept. 14	P.	22 10 41.08	106 36 11.8
24	P.	40.96	9.9
27	F.	41.16	12.9
Oct. 5	Sk.	41.07	12.0
Mean . . .		22 10 41.068	106 36 11.65
Div., Flex., etc.		. .	− 0.06

ANONYMOUS.

1875.		h. m. s.	° ′ ″
Sept. 7 (9.0)	F.	22 12 55.13	106 9 14.5
Oct. 13	Sk.	55.11	13.6
27	F.	55.16	15.1
Mean . . .		22 12 55.133	106 9 14.40
Div., Flex., etc.		. .	− 0.05

LALANDE 43567.

1875.		h. m. s.	° ′ ″
Sept. 27 (8.0)	F.	22 13 46.75	105 10 53.6
Oct. 12	F.	46.70	52.2
27	F.	46.70	52.9
Mean . . .		22 13 46.717	105 10 52.90
Div., Flex., etc.		. .	− 0.03

LALANDE 43596.

1875.		h. m. s.	° ′ ″
Sept. 27 (7.5)	F.	22 14 50.58	105 5 10.3
Oct. 12	F.	50.46	8.2
13	F.	50.51	7.7
27	F.	50.45	7.6
Mean . . .		22 14 50.500	105 5 8.45
Div., Flex., etc.		. .	− 0.02

B. A. C. 7795.

1875.		h. m. s.	° ′ ″
Oct. 29	Sk.	22 15 12.04	92 1 0.1
Nov. 2	P.	11.99	0 59.9
5	P.	11.96	1 0.3
Mean . . .		22 15 11.997	92 1 0.10
Div., Flex., etc.		. .	− 0.01

TRANSIT ZONES 205, 40.

1875.		h. m. s.	° ′ ″
Aug. 21	P.	22 16 37.48	105 34 34.3
30	P.	37.57	34.9
Sept. 7 (8.0)	F.	37.29	34.3
Mean . . .		22 16 37.447	105 34 34.50
Div., Flex., etc.		. .	− 0.04

TRANSIT ZONES 204, 17.

1875.		h. m. s.	° ′ ″
Aug. 21	P.	22 19 16.85	105 35 9.4
30	P.	16.93	10.0
Sept. 7 (8.5)	F.	16.80	9.0
Mean . . .		22 19 16.860	105 35 9.47
Div., Flex., etc.		. .	− 0.04

B. A. C. 7826.

1875.		h. m. s.	° ′ ″
Sept. 20	P.	22 21 19.21	129 45 49.4
27	F.	19.35	46.8
Oct. 20	P.	19.32	50.8
25 (7.8)	Sk.	19.31	47.5
Mean . . .		22 21 19.298	129 45 48.62
Div., Flex., etc.		. .	+ 0.35

B. A. C. 7842.

1875.		h. m. s.	° ′ ″
Aug. 21	P.	22 24 23.73	122 59 11.0
Sept. 7 (6.0)	F.	23.65	8.2
20	P.	23.61	9.3
Mean . . .		22 24 23.663	122 59 9.50
Div., Flex., etc.		. .	+ 0.23

B. A. C. 7872.

1875.		h. m. s.	° ′ ″
Aug. 30	P.	22 29 33.13	122 18 34.0
Sept. 20	P.	33.00	32.5
Oct. 5	Sk.	33.20	32.8
Mean . . .		22 29 33.110	122 18 33.10
Div., Flex., etc.		. .	+ 0.24

WEISSE 604.

1875.		h. m. s.	° ′ ″
Aug. 21	P.	22 30 8.68	103 1 42.9
Sept. 3	F.	8.71	43.9
7 (9.0)	F.	8.70	42.7
Mean . . .		22 30 8.697	103 1 43.17
Div., Flex., etc.		. .	− 0.02

B. A. C. 7895.

1875.		h. m. s.	° ′ ″
Sept. 8	P.	22 33 23.62	121 18 10.1
20	P.	23.56	7.9
Oct. 5	Sk.	23.72	. .
20	P.	23.64	8.8
Mean . . .		22 33 23.635	121 18 8.93
Div., Flex., etc.		. .	+ 0.25

B. A. C. 7909.

1875.		h. m. s.	° ′ ″
Sept. 8	P.	22 35 24.75	120 0 47.3
Oct. 20	P.	24.80	50.6
Nov. 2	P.	24.77	48.3
Mean . . .		22 35 24.773	120 0 48.73
Div., Flex., etc.		. .	+ 0.24

B. A. C. 7923.

1875.		h. m. s.	° ′ ″
Feb. 13	F.	22 37 8.64	60 25 56.1
Mar. 22	Sk.	8.71	58.4
April 4	E.	8.64	55.7
Aug. 21	P.	8.68	55.6
Sept. 20	P.	8.68	54.9
Oct. 5	Sk.	8.81	55.4
Mean . . .		22 37 8.693	60 25 56.02
Div., Flex., etc.		. .	− 0.09

B. A. C. 7944.

1875.		h. m. s.	° ′ ″
Aug. 9	P.	22 40 40.42	128 52 40.7
20	P.	40.43	43.0
Sept. 7 (7.0)	F.	40.23	40.1
Mean . . .		22 40 40.377	128 52 41.27
Div., Flex., etc.		. .	+ 0.33

B. A. C. 7957.

1875.			h.	m.	s.	°	′	″
Aug.	30	P.	22	43	55.10	129	49	8.4
Sept.	7 (6.0)	F.			55.06			5.7
	8	P.			54.93			8.7
Mean . . .			22	43	55.030	129	49	7.60
Div., Flex., etc.					. .		+	0.35

B. A. C. 7966.

1875.			h.	m.	s.	°	′	″
Sept.	8	P.	22	45	34.39	123	32	15.3
	20	P.			34.34			17.4
Oct.	13 (5.0)	Sk.			34.44			14.2
Mean . . .			22	45	34.390	123	32	15.63
Div., Flex., etc.					. .		+	0.22

B. A. C. 7980.

1875.			h.	m.	s.	°	′	″
Aug.	21	P.	22	48	0.92	106	29	7.2
Sept.	7 (4.0)	F.			0.94			7.8
	20	P.			0.93			6.7
Mean . . .			22	48	0.930	106	29	7.23
Div., Flex., etc.					. .		—	0.06

B. A. C. 7987.

1875.			h.	m.	s.	°	′	″
Sept.	7 (4.0)	F.	22	49	1.16	123	12	23.6
	8	P.			1.28			24.2
Oct.	25	Sk.			1.26			25.2
Mean . . .			22	49	1.233	123	12	24.33
Div., Flex., etc.					. .		+	0.23

B. A. C. 7998.

1875.			h.	m.	s.	°	′	″
Sept.	27	F.	22	51	. .	126	11	15.4
Oct.	29	Sk.			37.19			16.2
Nov.	5	P.			37.10			17.1
Mean . . .			22	51	37.145	126	11	16.23
Div., Flex., etc.					. .		+	0.25

B. A. C. 8002.

1875.			h.	m.	s.	°	′	″
Sept.	14	P.	22	52	45.32	120	7	54.1
Oct.	2	E.			45.41			53.3
	25	Sk.			45.46			53.5
Mean . . .			22	52	45.397	120	7	53.97
Div., Flex., etc.					. .		+	0.24

B. A. C. 8025.

1875.			h.	m.	s.	°	′	″
Sept.	7 (6.0)	F.	22	56	34.43	125	25	28.1
	8	P.			34.53			29.5
	14	P.			34.45			28.9
Mean . . .			22	56	34.470	125	25	28.83
Div., Flex., etc.					. .		+	0.22

B. A. C. 8032.

1875.			h.	m.	s.	°	′	″
Feb.	13	F.	22	57	42.96	62	35	41.8
April	4	E.			42.98			44.4
Aug.	21	P.			42.96			43.7
Sept.	20	P.			42.97			40.9
Oct.	2	E.			43.01			43.7
Mean . . .			22	57	42.976	62	35	42.90
Div., Flex., etc.					. .		—	0.08

B. A. C. 8045.

1875.			h.	m.	s.	°	′	″
Sept.	7 (6.5)	F.	22	59	55.72	129	34	4.5
	8	P.			55.73			4.6
	14	P.			55.68			4.3
Oct.	13 (7.5)	Sk.			55.80			1.4
Mean . . .			22	59	55.732	129	34	3.70
Div., Flex., etc.					. .		+	0.35

WEISSE 22¹.

1875.			h.	m.	s.	°	′	″
Aug.	30	P.	23	3	37.01	98	44	48.5
Sept.	3	F.			36.98			45.9
	27	F.			. .			46.4
Mean . . .			23	3	36.995	98	44	46.93
Div., Flex., etc.					. .		—	0.10

WEISSE 22².

1875.			h.	m.	s.	°	′	″
Sept.	3	F.	23	3	37.21	98	44	43.0
Div., Flex., etc.					. .		—	0.10

WEISSE 103.

1875.			h.	m.	s.	°	′	″
Aug.	30	P.	23	7	. .	99	36	12.8
Sept.	3	F.			32.84			12.6
	24	P.			32.82			12.0
	27	F.			. .			12.9
Oct.	2	E.			32.93			15.6
Mean . . .			23	7	32.863	99	36	13.18
Div., Flex., etc.					. .		—	0.12

WEISSE 104.

1875.			h.	m.	s.	°	′	″
Aug.	30	P.	23	7	. .	99	36	39.3
Sept.	3	F.			32.99			39.8
	24	P.			32.95			37.6
	27	F.			. .			39.8
Oct.	2	E.			32.98			40.6
Mean . . .			23	7	32.973	99	36	39.42
Div., Flex., etc.					. .		—	0.12

WEISSE 109.

1875.			h.	m.	s.	°	′	″
Aug.	30	P.	23	7	41.53	99	37	6.0
Sept.	3	F.			41.43			5.4
	24	P.			41.40			4.3
	27	F.			. .			4.8
Oct.	2	E.			41.47			6.5
Mean . . .			23	7	41.458	99	37	5.40
Div., Flex., etc.					. .		—	0.12

ψ^1 AQUARII.

1875.			h.	m.	s.	°	′	″
Sept.	7 (3 5)	F.	23	9	20.51	99	46	7.3
Oct.	20	P.			20.56			7.3
	25	Sk.			20.64			6.5
Mean . . .			23	9	20.570	99	46	7.03
Div., Flex., etc.					. .		—	0.12

B. A. C. 8102.

1875.			h.	m.	s.	°	′	″
Oct.	27	F.	23	10	22.19	98	24	29.0
Nov.	2	P.			22.22			28.7
	8	F.			22.19			28.6
Mean . . .			23	10	22.200	98	24	28.77
Div., Flex., etc.					. .		—	0.08

LALANDE 45562.

1875.			h.	m.	s.	°	′	″
Oct.	28	P.	23	10	29.53	97	50	40.6
	29	Sk.			29.55			40.8
Nov.	5	P.			29.44			40.0
Mean . . .			23	10	29.507	97	50	40.47
Div., Flex., etc.					. .		—	0.04

B. A. C. 8113.

1875.			h.	m.	s.	°	′	″
Sept.	20	P.	23	12	4.23	123	12	44.6
Oct.	7	F.			4.31			49.7
	25	Sk.			4.26			44.5
Mean . . .			23	12	4.267	123	12	46.27
Div., Flex., etc.					. .		+	0.23

B. A. C. 8172.

1875.			h.	m.	s.	°	′	″
Sept.	20	P.	23	21	17.85	126	13	56.3
	24	P.			17.88			57.7
Oct.	7	F.			17.94			55.8
	12	F.			17.87			57.3
Mean . . .			23	21	17.850	126	13	56.78
Div., Flex., etc.					. .		+	0.25

DURCH. 18°, 5165.

1875.			h.	m.	s.	°	′	″
Aug.	30	P.	23	26	15.57	71	17	40.1
Div., Flex., etc.					. .		—	0.33

B. A. C. 8201.

1875.			h.	m.	s.	°	′	″
July	21 (6.0)	Sk.	23	26	15.78	128	30	35.1
Sept.	20	P.			15.70			31.2
	24	P.			15.94			33.3
Oct.	7	F.			15.83			32.7
Mean . . .			23	26	15.812	128	30	33.08
Div., Flex., etc.					. .		+	0.32

WEISSE (2) 628.

1875.			h.	m.	s.	°	′	″
Aug.	25	P.	23	30	28.30	71	30	27.9
	30	P.			28.20			28.7
Mean . . .			23	30	28.250	71	30	28.30
Div., Flex., etc.					. .		—	0.34

ANONYMOUS.

1875.			h.	m.	s.	°	′	″
Aug.	20	P.	23	41	13.66	95	9	24.8
	21	P.			13.83			24.3
Oct.	28	P.			13.81			24.9
Mean . . .			23	41	13.767	95	9	24.67
Div., Flex., etc.					. .		+	0.10

ANONYMOUS.

1875.			h.	m.	s.	°	′	″
Sept.	4	P.	23	41	24.48	95	37	28.7
	20	P.			24.53			27.8
Oct.	25	Sk.			24.36			27.1
Mean . . .			23	41	24.457	95	37	27.87
Div., Flex., etc.					. .		+	0.08

Weisse 839.

1875.		h.	m.	s.	°	′	″
Sept. 8	P.	23	42	3.05	95	22	41.1
14	P.			3.00			40.2
24	P.			3.19			40.7
Oct. 25	Sk.			2.96			40.3
29	Sk.			2.97			40.2
Mean . . .		23	42	3.034	95	22	40.50
Div., Flex., etc.				. .		+	0.09

Weisse 848.

1875.		h.	m.	s.	°	′	″
Aug. 20	P.	23	42	20.04	95	7	49.9
21	P.			20.19			50.0
Oct. 28	P.			20.17			51.1
Mean . . .		23	42	20.133	95	7	50.33
Div., Flex., etc.				. .		+	0.10

B. A. C. 8309.

1875.		h.	m.	s.	°	′	″
July 21 (7.5)	Sk.	23	48	4.96	130	59	49.6
Aug. 20	P.			4.96			51.6
Sept. 3 (5.0)	F.			5.08			51.8
Mean . . .		23	48	5.000	130	59	51.00
Div., Flex., etc.				. . .		+	0.37

B. A. C. 8332.

1875.		h.	m.	s.	°	′	″
July 21 (6.5)	Sk.	23	53	2.22	120	10	52.0
Sept. 24	P.			2.27			52.0
Oct. 13 (7.0)	Sk.			2.36			49.5
29	Sk.			2.37			51.0
Mean . . .		23	53	2.305	120	10	51.12
Div., Flex., etc.				. .		+	0.24

B. A. C. 8343.

1875.		h.	m.	s.	°	′	″
Sept. 8	P.	23	55	16.20	130	50	37.0
Oct. 13 (8.0)	Sk.			16.27			33.9
28	P.			16.33			41.4
29	Sk.			16.28			38.7
Mean . . .		23	55	16.270	130	50	37.75
Div., Flex., etc.				. .		+	0.37

Weisse 1114.

1875.		h.	m.	s.	°	′	″
Aug. 21	P.	23	55	25.20	93	43	24.1
Sept. 4	P.			25.18			24.9
7	F.			. .			24.2
Oct. 25	Sk.			25.10			24.7
Mean . . .		23	55	25.160	93	43	24.48
Div., Flex., etc.				. .		+	0.08

B. A. C. 8348.

1875.		h.	m.	s.	°	′	″
Nov. 2	P.	23	55	30.49	127	55	26.1
6	Sk.			30.72			29.9
10	Sk.			30.50			27.6
Mean . . .		23	55	30.570	127	55	27.87
Div., Flex., etc.				. .		+	0.31

B. A. C. 8352.

1875.		h.	m.	s.	°	′	″
Sept. 3	F.	23	55	55.32	120	24	59.2
Nov. 5	P.			55.06		25	1.2
12	P.			55.35		25	2.7
17	P.			55.17		24	59.8
Mean . . .		23	55	55.225	120	25	0.72
Div., Flex., etc.				. .		+	0.24

B. A. C. 8357.

1875.		h.	m.	s.	°	′	″
Aug. 20	P.	23	57	1.45	126	56	. .
Sept. 3	F.			1.68			52.8
Nov. 5	P.			1.33			51.8
6	Sk.			1.58			52.9
10	Sk.			1.39			51.3
Mean . . .		23	57	1.486	126	56	52.20
Div., Flex., etc.				. .		+	0.29

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1875.

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B. A. C. 8374, +28° 19′.

1875.	h.	m.	s.	Mag.
Dec. 2	0	0	7.73	6.5

B. A. C. 8375, −39° 36′.

Nov. 17	0	0	31.15	

Lalande 47310, +36° 33′.

Nov. 12	0	1	35.81	8.8

α Andromedæ, +28° 24′.

Nov. 16	0	1	55.78	
30			55.78	

(*) +36° 42′.

Nov. 12	0	5	43.95	8.8

Lalande 100, +36° 42′.

Nov. 12	0	6	34.95	7.8
Dec. 2			35.05	7.5

γ Pegasi, +14° 30′.

Nov. 16	0	6	47.98	
17		6	48.05	6.0
Dec. 22		6	48.04	
30		6	47.96	

Lalande 231, +39° 5′.

Nov. 12	0	10	23.22	8.0
16			23.02	8.3

Lalande 409, +37° 3′.

Nov. 12	0	15	41.88	7.8
16			41.81	7.2

Lalande 489, +38° 19′.

Nov. 12	0	18	29.45	8.3

Weisse 305, + 3° 13′.

Nov. 30	0	19	30.82	
Dec. 22			30.93	

(*)+0° 27′.

Dec. 2	0	19	47.83	8.0

Weisse 321, −4° 40′.

1875.	h.	m.	s.	Mag.
Nov. 16	0	20	34.09	8.8

(*)−36° 25′.

Nov. 12	0	23	11.93	8.5
17			12.15	

(*)+38° 16′.

Dec. 2	0	24	40.84	
22			40.62	

Lalande 713, +38° 16′.

Dec. 2	0	24	44.44	
22			44.41	

(*)+35° 8′.

Nov. 16	0	25	18.42	8.8

Lalande 767, +35° 8′.

Nov. 11	0	26	12.24	
17			12.24	

Weisse 444, −9° 26′.

Nov. 12	0	27	36.78	9.0

(* 127) Washington, + 2° 37′.

Dec. 2	0	29	11.92	

Weisse 510, +7° 19′.

Nov. 11	0	31	14.63	8.0
16			14.67	7.5

Weisse (2) 832, +26° 1′.

Dec. 22	0	32	51.38	8.0

Weisse 588, +2° 56′.

Nov. 16	0	35	20.30	8.0

λ Sculptoris, −39° 11′.

Nov. 11	0	36	41.67	
30			41.52	

β Ceti, −18° 40′.

1875.	h.	m.	s.	Mag.
Oct. 7	0	37	18.83	
Nov. 12			18.77	
17			18.75	
Dec. 15			18.70	
27			18.83	

(*)−1° 53′.

Nov. 16	0	39	21.06	8.5
Dec. 22			21.11	8.5

Lacaille 220, −29° 12′.

Oct. 7	0	42	34.25	
Nov. 11			34.38	6.0

(*)−24° 5′.

Nov. 12	0	42	35.39	8.5

O. Arg. S. 435, −24° 52′.

Nov. 16	0	42	35.61	8.3
30			35.48	8.3

ν Andromedæ, +40° 23′

Dec. 20	0	42	55.48	
27			55.50	

Lamont 223, −24° 50′.

Nov. 2	0	43	4.39	
17			4.19	
30			4.13	6.0
Dec. 2			4.11	

Lalande 1504, (1st *), +38° 28.

Nov. 17	0	47	43.58	9.0
Dec. 22			43.70	8.5
27			43.65	8.5

Lalande 1504, (2d *), +38° 30′.

Nov. 17	0	47	43.81	8.5
Dec. 22			43.70	8.0
27			43.78	8.0

γ Cassiopeæ, +60° 1′.

Nov. 30	0	49	10.86	
Dec. 2			10.79	
15			10.89	

(*)+1° 54′.

1875.	h.	m.	s.	Mag.
Dec. 20	0	51	58.19	9.5
22			58.03	
27			57.91	9.0

*ϕ*⁴ Ceti, − 12° 4′.

Oct. 7	0	52	28.12	
Nov. 12			28.21	

Weisse 950, + 9° 25′.

Dec. 15	0	55	25.50	

70 Piscium, + 7° 15′.

Nov. 11	0	55	36.80	7.0

Weisse 972, + 9° 25′.

Nov. 30	0	56	31.97	
Dec. 2			31.91	
15			32.19	

ε Piscium, + 7° 13′.

Nov. 11	0	56	27.32	
Dec. 17			27.44	
20			27.43	
22			27.41	

O. Arg. S. 626, − 24° 40′.

Nov. 30	1	0	4.04	6.0

O. Arg. S. 635, − 24° 40′.

Nov. 30	1	1	8.54	6.5

B. A. C. 326, − 33° 30′.

Dec. 15	1	1	46.56	8.0
17			46.94	
20			46.61	8.0

B. A. C. 355, − 32° 55′.

Nov. 30	1	5	15.95	7.5
Dec. 15			16.18	
20			16.32	

34 Ceti, − 2° 55′.

Dec. 27	1	5	22.04	

1875.	h.	m.	s.	Mag.
WEISSE 88, – 2° 47′.				
Dec. 22 . .	1	7	42.48	
27 . .			42.63	7.5
WEISSE 91, – 2° 51′.				
Dec. 22 . .	1	7	52.31	
27 . .			52.36	8.5
(*)– 32° 28′.				
Dec. 22 . .	1	18	55.02	
B. A. C. 445, –30° 33′.				
Dec. 20 . .	1	22	54.94	
27 . .			54.78	8.0
η PISCIUM, + 14° 42′.				
Nov. 11 . .	1	24	47.78	
12 . .			47.77	
17 . .			47.79	
30 . .			47.75	
Dec. 2 . .			47.83	
15 . .			47.84	
17 . .			47.80	
WEISSE 432, – 2° 18′.				
Dec. 20 . .	1	26	20.47	9.0
22 . .			20.30	
(*)– 2° 18′.				
Dec. 20 . .	1	27	16.49	9.0
B. A. C. 466, – 37° 31′.				
Nov. 17 . .	1	27	20.53	
(*)+ 3° 26′.				
Dec. 17 . .	1	31	13.98	
B. A. C. 491, – 10° 5′.				
Nov. 12 . .	1	31	22.74	6.0
30 . .			22.72	
(*)+ 3° 26′.				
Dec. 20 . .	1	31	34.03	9.0
(*)+ 2° 54′.				
Dec. 27 . .	1	33	6.35	8.0
τ ANDROMEDÆ, + 39° 57′.				
Nov. 15 . .	1	33	12.55	
17 . .			12.47	5.0
22 . .			12.34	
(*)+ 39° 44′.				
Nov. 12 . .	1	35	14.35	6.5
τ CETI, – 16° 38′.				
Nov. 17 . .	1	38	15.22	
30 . .			15.40	

1875.	h.	m.	s.	Mag.
o PISCIUM, + 8° 32′.				
Nov. 12 . .	1	38	47.66	
Dec. 2 . .			47.62	
17 . .			47.61	
22 . .			47.68	
(*)+0° 21′.				
Dec. 27 . .	1	40	35.67	9.0
WEISSE 778+ 3° 35′.				
Dec. 27 . .	1	44	31.14	8.0
LALANDE 3390, + 36° 47′.				
Nov. 30 . .	1	45	0.67	
Dec. 2 . .			0.69	
15 . .			0.68	6.0
(*)+ 36° 40′.				
Dec. 22 . .	1	45	30.84	
LALANDE 3412, + 36° 40′.				
Nov. 17 . .	1	45	48.93	
Dec. 15 . .			48.80	7.0
22 . .			48.73	
(*)+ 36° 40′.				
Nov. 17 . .	1	45	49.05	
B. A. C. 575, + 40° 6′.				
Dec. 20 . .	1	47	22.89	
27 . .			22.82	
β ARIETIS, + 20° 12′.				
Dec. 17 . .	1	47	44.28	
B. A. C. 627, – 30° 35′.				
Nov. 17 . .	1	55	39.67	5.5
Dec. 15 . .			39.75	5.5
(*)–4° 59′.				
Dec. 15 . .	1	58	51.99	7.5
WEISSE 1048, –4° 59′.				
Nov. 17 . .	1	59	57.81	
Dec. 2 . .			57.77	
15 . .			57.79	6.5
WEISSE 1069, –4° 49′.				
Dec. 20 . .	2	0	44.99	7.5
22 . .			44.85	7.5
O. ARG. S. 1354, –29° 36′.				
Dec. 22 . .	2	4	7.86	7.5
64 CETI, +7° 58′.				
Dec. 2 . .	2	4	45.22	
20 . .			45.19	6.0

1875.	h.	m.	s.	Mag.
GROOMBRIDGE 466, +52° 31′.				
Dec. 27 . .	2	5	11.92	
*ξ*¹ CETI, +8° 16′.				
Nov. 17 . .	2	6	22.57	
Dec. 17 . .			22.52	
WEISSE 102, +4° 18′.				
Dec. 20 . .	2	8	27.33	8.2
22 . .			27.39	8.0
27 . .			27.26	8.0
LALANDE 4238, +17° 51′.				
Dec. 2 . .	2	10	50.75	
15 . .			50.76	7.0
WEISSE 155, +12° 24′.				
Nov. 30 . .	2	12	5.23	7.0
(*)–11° 8′.				
Dec. 27 . .	2	13	5.80	9.0
WEISSE 186, –11° 12′.				
Dec. 20 . .	2	13	19.00	8.0
22 . .			19.08	8.2
27 . .			19.09	8.0
(*)+13° 2′.				
Dec. 17 . .	2	13	48.46	8.0
LALANDE 4342, +37° 8′.				
Nov. 30 . .	2	14	46.22	8.0
Dec. 2 . .			46.28	
15 . .			46.50	7.0
O. ARG. S. 1554, –24° 26′.				
Dec. 15 . .	2	20	11.45	7.5
O. ARG. S. 1558, –24° 24′.				
Dec. 15 . .	2	20	35.70	8.2
20 . .			35.56	8.2
LACAILLE 749, –34° 22′.				
Nov. 30 . .	2	22	43.97	5.5
Dec. 22 . .			44.37	6.0
B. A. C. 766, +24° 40′.				
Dec. 2 . .	2	23	21.15	6.0
17 . .			21.04	6.0
LACAILLE 767, –33° 42′.				
Dec. 15 . .	2	24	56.51	
20 . .			56.46	
(*)–33° 42′.				
Nov. 30 . .	2	25	28.17	7.0

1875.	h.	m.	s.	Mag.
B. A. C. 793, +6° 17′.				
Dec. 22 . .	2	29	13.79	6.0
27 . .			13.77	
B. A. C. 803, –30° 35′.				
Nov. 30 . .	2	30	45.55	
Dec. 15 . .			45.70	5.5
WEISSE (2) 727. +25° 41′.				
Dec. 20 . .	2	31	20.77	8.8
(*)+25° 41′.				
Dec. 2 . .	2	31	44.46	8.0
γ CETI, +2° 43′.				
Nov. 30 . .	2	36	49.55	
Dec. 2 . .			49.43	
15 . .			49.50	
20 . .			49.51	
27 . .			49.48	
(*)+8° 1′.				
Dec. 15 . .	2	48	30.57	9.0
WEISSE (2) 1148, +25° 35′.				
Nov. 27 . .	2	48	45.22	8.3
30 . .			45.38	
WEISSE 881, +14° 41′.				
Dec. 15 . .	2	51	44.14	8.0
22 . .			44.11	
α CETI, +3° 36′.				
Nov. 27 . .	2	55	44.75	
Dec. 15 . .			44.82	
27 . .			44.76	
(*)+37° 6′.				
Dec. 15 . .	2	58	6.72	
20 . .			6.73	
WEISSE 1066, +13° 47′.				
Nov. 30 . .	3	1	13.89	8.5
WEISSE (26), +9° 31′.				
Nov. 27 . .	3	4	3.59	
30 . .			3.66	7.5
(*)+38° 27′.				
Dec. 15 . .	3	5	0.57	
20 . .			0.63	
22 . .			0.26	
27 . .			0.34	
WEISSE (2) 58, +38° 27′.				
Dec. 15 . .	3	5	4.51	
20 . .			4.63	8.5
22 . .			4.54	8.0
27 . .			4.63	

1875.	h.	m.	s.	Mag.
Weisse (2) 67, +38° 29′.				
Dec. 20	3	5	21.61	
22			21.65	8.3
27			21.68	
Lalande 5997, – 18° 5′.				
Nov. 30	3	7	24.48	8.0
ζ Arietis, + 20° 35′.				
Nov. 27	3	7	43.17	
Weisse (2) 209, + 23° 52′.				
Dec. 15	3	11	0.66	
20			0.36	
B. A. C. 1047, – 27° 4′.				
Nov. 27	3	15	24.84	
30			24.62	6.0
(*)+ 24° 58′.				
Dec. 20	3	16	19.97	9.0
27			19.80	9.5
66 Arietis, + 22° 21′.				
Nov. 30	3	21	8.23	
Dec. 27			8.33	
(*)+ 5° 26′.				
Dec. 20	3	22	50.71	
(*)+ 5° 29′.				
Dec. 20	3	22	59.63	
17 Eridani, – 5° 30′.				
Nov. 27	3	24	24.98	5.5
(*)+ 46° 50′.				
Dec. 27	3	25	29.20	
Lacaille 1124, – 26° 2′.				
Nov. 27	3	26	32.72	
Dec. 22			32.94	
(*)+ 31° 36′.				
Dec. 15	3	27	14.25	
(*)+ 31° 17′.				
Dec. 20	3	27	35.45	8.5
(*)+ 46° 50′.				
Dec. 27	3	27	57.55	
(*)+ 46° 50′.				
Dec. 27	3	28	17.29	

1875.	h.	m.	s.	Mag.
(*)+ 31° 36′.				
Dec. 15	3	28	46.17	
B. A. C. 1130, – 28° 18′.				
Nov. 27	3	33	35.66	6.0
Dec. 15			35.55	5.5
20			35.60	6.0
Weisse (2) 776, + 44° 57′.				
Dec. 27	3	36	50.90	8.0
16 Tauri, + 23° 54′.				
Dec. 20	3	37	22.57	
22			22.50	
57 Pleiadum, + 23° 52′.				
Dec. 20	3	37	40.88	
(*)+ 23° 52′.				
Dec. 22	3	37	47.05	
Lacaille 1196, – 31° 29′.				
Nov. 27	3	38	8.71	6.5
21 Tauri, + 24° 8′.				
Dec. 15	3	38	27.84	6.0
22 Tauri, + 24° 8′.				
Dec. 15	3	38	36.42	6.5
Weisse (2) 847, + 44° 57′.				
Dec. 27	3	39	21.49	8.0
23 Pleiadum, + 23° 17′.				
Dec. 22	3	40	2.26	
η Tauri, + 23° 43′.				
Nov. 30	3	40	3.32	
Weisse (2) 882, + 44° 34′.				
Nov. 27	3	41	23.18	6.0
τ^6 Eridani, – 23° 38′.				
Dec. 20	3	41	28.18	5.5
Radcliffe 1084, + 40° 25′.				
Dec. 27	3	43	40.65	7.8
O. Arg. S. 2571, – 27° 30′.				
Dec. 15	3	44	20.93	8.0

1875.	h.	m.	s.	Mag.
Lalande 7206, + 34° 43′.				
Nov. 27	3	48	25.35	6.0
Dec. 20			25.56	6.0
Weisse (2) 1030, + 35° 35′.				
Dec. 22	3	48	37.10	
27			37.21	8.2
(*)+ 35° 35′.				
Dec. 22	3	49	31.36	
γ^1 Eridani, – 13° 52′.				
Nov. 27	3	52	11.86	
Dec. 15			11.81	
20			11.78	
22			11.82	
Weisse (2) 1143, + 35° 2′.				
Dec. 27	3	54	35.77	
A^2 Tauri, + 21° 41′.				
Dec. 27	3	57	56.40	
(*)+21° 43′.				
Dec. 20	3	57	57.36	8.0
22			57.16	
27			57.26	
O. Arg. S. 2803, –23° 36′.				
Dec. 20	4	0	50.32	
Lalande 7773, +44° 26′.				
Nov. 27	4	5	22.46	
(*)+44° 28′.				
Dec. 27	4	6	19.77	9.2
(*)+44° 28′.				
Nov. 27	4	6	23.49	
Dec. 27			23.62	8.0
B. A. C. 1307, +49° 44′.				
Dec. 20	4	9	50.85	
22			50.71	5.5
51 Tauri, +21° 17′.				
Nov. 27	4	10	59.44	
Dec. 27			59.50	6.0
(*)+33° 50′.				
Dec. 22	4	16	17.62	
55 Persei, +33° 50′.				
Dec. 22	4	16	22.58	
Weisse (2) 344 +16° 32′.				
Dec. 27	4	17	17.72	8.3

1875.	h.	m.	s.	Mag.
ε Tauri, +18° 54′.				
Dec. 22	4	21	19.13	
Lacaille 1463, –32° 41′.				
Dec. 27	4	22	53.79	7.0
(*)+35° 35′.				
Dec. 22	4	24	47.54	8.2
B. A. C. 1404, –30° 43′.				
Dec. 27	4	25	28.85	7.0
α Tauri, +15° 16′.				
Nov. 27	4	28	44.97	
Dec. 20			45.04	
(*)+27° 0′.				
Dec. 22	4	29	1.10	8.5
Weisse (2) 676, +41° 51′.				
Dec. 27	4	32	45.47	8.0
(*)+38° 8′.				
Dec. 22	4	34	9.04	7.5
(*)+38° 11′.				
Dec. 22	4	34	20.19	6.0
π′ Orionis, +6° 44′.				
Dec. 22	4	43	3.39	5.0
Lacaille 1611, –35° 19′.				
Dec. 27	4	44	36.35	
ι Aurigæ, +32° 58′.				
Dec. 27	4	48	51.36	
Weisse 1105, +1° 30′.				
Dec. 22	4	51	37.23	7.5
27			37.18	8.0
11 Orionis, +15° 13′.				
Dec. 27	4	57	25.67	
Weisse 111, +30° 15′.				
Dec. 22	5	6	14.95	
(*)+38° 58′.				
Dec. 22	5	19	9.49	
(*)+38° 58′.				
Dec. 22	5	19	28.87	

	1875.	h.	m.	s.	Mag.
LALANDE 10621, +38° 7′.	Dec. 22 . .	5	32	56.40	
WEISSE 1034, +9° 51′.	Dec. 22 . .	5	42	12.28	8.5
(*)+66° 53′.	Dec. 22 . .	5	47	50.91	
γ GEMINORUM, +16° 30′.	Dec. 22 . .	6	30	29.54	
ζ AQUILÆ, +13° 41′.	Oct. 5 . .	18	59	39.76	
α SAGITTARII, −19° 10′.	Oct. 5 . .	19	10	19.35	
δ AQUILÆ, +2° 52′.	Oct. 5 . .	19	19	11.72	
B. A. C. 6700, −21° 3′.	Oct. 9 . .	19	28	11.93	
B. A. C. 6711, +38° 29′.	Oct. 5 . .	19	29	14.88	
(*)+7° 18′.	Oct. 9 . .	19	30	40.25	
O. ARG. S. 19941, −26° 47′.	Oct. 5 . .	19	39	20.68	
α AQUILÆ, +8° 33′.	Oct. 7 . .	19	44	41.07	
β AQUILÆ, +6° 6′.	Oct. 5 . .	19	49	10.28	
	7 . .			10.38	
WEISSE 175, +39° 4′.	Oct. 5 . .	19	53	45.68	
(*)+36° 42′.	Oct. 7 . .	19	55	19.96	5.5
(*)+36° 44′.	Oct. 9 . .	19	56	20.95	
(*)+36° 41′.	Oct. 7 . .	19	56	39.45	6.5
	9 . .			39.62	

	1875.	h.	m.	s.	Mag.
(*)+33° 7′.	Oct. 5 . .	20	0	44.94	
	9 . .			45.07	8.5
(*)+33° 7′.	Oct. 5 . .	20	1	55.49	
	7 . .			55.58	8.5
	9 . .			55.56	8.0
(*)+33° 4′.	Oct. 5 . .	20	3	21.35	
LALANDE 38708, +38° 45′.	Oct. 7 . .	20	5	20.64	
	9 . .			20.60	7.0
(*)+36° 21′.	Oct. 5 . .	20	8	30.51	
*b*³ CYGNI, +36° 24.	Oct. 5 . .	20	9	50.87	
B. A. C. 6969, +36° 21′.	Oct. 5 . .	20	9	58.83	
	7 . .			59.35	7.5
(*)+36° 44′.	Oct. 5 . .	20	15	1.23	
B. A. C. 7006, +36° 44′.	Oct. 5 . .	20	15	1.23	
25 VULPECULÆ, +24° 3′.	Oct. 9 . .	20	16	40.92	5.5
(*)+36° 44′.	Oct. 7 . .	20	16	49.14	
O. ARG. S. 20533, −21° 20′.	Oct. 5 . .	20	21	44.13	
	7 . .			44.26	6.5
(*)−0° 8′.	Oct. 7 . .	20	26	54.14	
B. A. C. 7114, +40° 40′.	Oct. 7 . .	20	30	5.58	
	9 . .			5.54	
B. A. C. 7130, +7° 9′.	Oct. 5 . .	20	32	42.97	
(*)+37° 45′.	Oct. 9 . .	20	33	57.14	8.5

	1875.	h.	m.	s.	Mag.
52 CYGNI, +30° 17′.	Oct. 5 . .	20	40	29.88	
	7 . .			29.82	5.0
	9 . .			30.11	5.5
(*)−21° 29′.	Oct. 7 . .	20	44	15.93	8.5
(*)+38° 49′.	Oct. 9 . .	20	44	26.22	
(*)+37° 56′.	Oct. 7 . .	20	47	18.26	
17 DELPHINI, +13° 15′.	Oct. 5 . .	20	49	41.41	
	9 . .			41.48	
B. A. C. 7269, + 3° 42′.	Oct. 7 . .	20	51	32.86	7.0
RADCLIFFE 5050, + 43° 55′.	Oct. 5 . .	20	54	15.67	
	7 . .			15.90	
(*)− 32° 50′.	Oct. 5 . .	20	58	45.92	
(*)− 12° 15′.	Oct. 5 . .	21	3	59.73	
(*)− 12° 12′.	Oct. 5 . .	21	5	38.13	
ζ CYGNI, + 29° 43′.	Oct. 7 . .	21	7	36.89	
B. A. C. 7378, −20° 41′.	Oct. 5 . .	21	9	34.64	
B. A. C. 7408, − 9° 52′.	Oct. 5 . .	21	15	16.07	
	7 . .			16.09	7.0
1 PEGASI, + 19° 16′.	Nov. 11 . .	21	16	18.40	
LALANDE 41624, + 38° 4′.	Oct. 7 . .	21	17	47.43	
(*)+ 38° 6′.	Oct. 5 . .	21	20	48.67	
(*)−25° 46′.	Oct. 7 . .	21	24	53.29	

	1875.	h.	m.	s.	Mag.
β AQUARII, −6° 7′.	Oct. 5 . .	21	24	58.61	
	Nov. 11 . .			58.62	
ξ AQUARII, − 8° 25′.	Oct. 5 . .	21	31	5.80	
	Nov. 12 . .			5.70	
5 PEGASI, + 18° 44′.	Oct. 7 . .	21	31	54.45	
	Nov. 11 . .			54.44	
WEISSE (2) 871, +34° 5′.	Oct. 5 . .	21	35	45.51	
	7 . .	21	35	45.74	
	Nov. 11 . .			45.62	
(*)+ 34° 6′.	Oct. 5 . .	21	36	3.15	
	Nov. 11 . .			3.54	
ε PEGASI, + 9° 18′.	Nov. 12 . .	21	38	2.80	
B. A. C. 7584, + 25° 2′.	Nov. 11 . .	21	39	16.37	
B. A. C. 7586, − 24° 59′.	Nov. 11 . .	21	40	42.57	
B. A. C. 7599, −17° 19′.	Nov. 12 . .	21	42	55.32	
	16 . .			55.49	5.0
LACAILLE 8945, −36° 16′.	Nov. 11 . .	21	45	2.47	
WEISSE 1063, −5° 55′.	Oct. 5 . .	21	46	3.41	
μ CAPRICORNI, − 14° 8′.	Nov. 16 . .	21	46	28.78	
u PISCIS AUSTRALIS, −29° 3′.	Oct. 5 . .	21	53	39.12	
O. ARG. S. 21796, − 23° 54′.	Nov. 11 . .	21	53	40.41	
	16 . .			40.56	8.5
α AQUARII, − 0° 55′.	Nov. 16 . .	21	59	21.75	

1875.	h.	m.	s.	Mag.
23 Pegasi, +28° 20′.				
Oct. 5 . .	21	59	54.54	
7 . .			54.73	
(*)+52° 15′.				
Nov. 12 . .	22	3	11.51	8.3
(*)+36° 47′.				
Oct. 5 . .	22	3	46.76	
O. Arg. S. 21964, −22° 1′.				
Nov. 11 . .	22	4	50.34	
B. A. C. 7772, −2° 13′.				
Nov. 12 . .	22	10	7.15	
θ Aquarii, −8° 24′.				
Oct. 5 . .	22	10	14.16	
7 . .			14.17	
Nov. 11 . .			14.20	
(*)−35° 7′.				
Nov. 12 . .	22	13	30.19	6.5
(*)−35° 7′.				
Nov. 12 . .	22	14	43.28	7.5
(*)−35° 7′.				
Nov. 12 . .	22	14	50.29	6.5
(*)−6° 45′.				
Oct. 5 . .	22	14	51.15	7.0
Weisse 281, −6° 49′.				
Oct. 5 . .	22	15	13.91	8.0
7 . .			14.03	7.5
(*)−8° 6′.				
Nov. 11 . .	22	15	41.45	8.3
(*)−8° 6′.				
Nov. 11 . .	22	15	55.79	8.5
π Aquarii, +0° 45′.				
Oct. 5 . .	22	18	53.46	
(*)−31° 5′.				
Oct. 5 . .	22	23	9.25	8.0
Nov. 11 . .			9.29	8.0

1875.	h.	m.	s.	Mag.
(*)−31° 5′.				
Nov. 12 . .	22	25	9.15	8.0
B. A. C. 7861, −10° 15′.				
Oct. 5 . .	22	27	31.44	7.0
7 . .			31.42	7.5
(*)−28° 12′.				
Nov. 12 . .	22	28	7.74	
O. Arg. S. 22282, −22° 27′.				
Oct. 5 . .	22	30	46.25	8.0
7 . .			46.36	
ζ Pegasi, +10° 11′.				
Nov. 12 . .	22	35	13.75	
ο Pegasi, +28° 37′.				
Oct. 5 . .	22	35	52.98	
7 . .			53.20	
O. Arg. N. 24689, +57° 53′.				
Nov. 11 . .	22	42	33.53	8.0
(*)−33° 31′.				
Oct. 7 . .	22	43	1.02	6.0
λ Aquarii, −8° 14′.				
Oct. 5 . .	22	46	5.59	
7 . .			5.46	
(*)+35° 22′.				
Nov. 11 . .	22	48	53.61	7.0
(*)+35° 22′.				
Nov. 11 . .	22	49	10.29	8.0
(*)+35° 22′.				
Nov. 11 . .	22	49	13.13	8.5
Lalande 44918, +38° 43′.				
Oct. 7 . .	22	51	49.87	
B. A. C. 8010, −9° 23′.				
Oct. 5 . .	22	53	48.08	
Nov. 17 . .			48.06	
α Pegasi, +14° 32′.				
Nov. 11 . .	22	58	32.14	
17 . .			32.10	

1875.	h.	m.	s.	Mag.
A Piscium, +1° 26′.				
Oct. 5 . .	23	2	16.65	
7 . .			16.72	
B. A. C. 8065, +1° 26′.				
Oct. 5 . .	23	2	59.30	
7 . .			59.25	
Lalande 45323, +38° 12′.				
Nov. 11 . .	23	3	3.81	6.5
12 . .			3.95	7.0
O. Arg. S. 22670.				
Nov. 17 . .	23	5	58.67	9.0
O. Arg. S. 22712, −22° 57′.				
Nov. 11 . .	23	9	3.27	8.0
O. Arg. S. 22721, −21° 52′.				
Oct. 7 . .	23	9	58.21	
Nov. 17 . .			58.21	
O. Arg. S. 22723, −21° 51′.				
Oct. 7 . .	23	10	12.14	
Nov. 17 . .			12.18	
(*)+36° 49′.				
Oct. 5 . .	23	14	41.33	
7 . .			41.39	
(*)+66° 21′.				
Nov. 11 . .	23	17	10.51	
12 . .			10.64	8.3
(*)+66° 18′.				
Nov. 12 . .	23	20	21.54	8.0
(*)+54° 8′.				
Oct. 7 . .	23	20	51.06	
Radcliffe 6081.				
Oct. 7 . .	23	21	21.05	
Nov. 11 . .			20.87	8.5
θ Piscium, +5° 42′.				
Nov. 17 . .	23	21	37.68	
30 . .			37.63	

1875.	h.	m.	s.	Mag.
(*)+35° 6′.				
Nov. 11 . .	23	30	51.96	
12 . .			52.09	7.5
(*)+35° 6′.				
Nov. 11 . .	23	31	16.59	
12 . .			16.59	6.5
75 Pegasi, +17° 42′.				
Nov. 17 . .	23	31	38.31	5.5
Lalande 46496, +6° 32′.				
Oct. 7 . .	23	37	34.00	
Nov. 12 . .			34.15	8.0
17 . .			34.18	8.5
B. A. C. 8280, +59° 16′.				
Oct. 7 . .	23	42	46.47	6.5
Nov. 17 . .			46.83	
79 Pegasi, +28° 8′.				
Nov. 12 . .	23	43	19.96	
B. A. C. 8296, +20° 57′.				
Nov. 12 . .	23	46	2.74	
(*)+21° 2′.				
Nov. 12 . .	23	46	19.31	
ω Piscium, +6° 11′.				
Dec. 2 . .	23	52	53.55	
22 . .			53.66	
Weisse 1090, +0° 21′.				
Nov. 12 . .	23	53	39.33	
(*)+0° 21′.				
Nov. 12 . .	23	54	10.15	
Lalande 9701, −35° 27′.				
Nov. 17 . .	23	56	35.85	6.0
(*)+0° 55′.				
Nov. 12 . .	23	57	14.81	
(*)+0° 50′.				
Nov. 12 . .	23	58	22.22	8.0

MEAN DECLINATIONS FOR 1875.0

OF

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1875.

MEAN DECLINATIONS FOR 1875.0

MURAL CIRCLE.

ψ^2 Piscium, $1^h\ 1^m\ 15^s$.

1875.		°	′	″
January	5 . .	+20	4	25.4

40 Ceti, $1^h\ 10^m\ 35^s$.

January	5 . .	− 2	56	4.1

B. A. C. 445, $1^h\ 22^m\ 51^s$.

January	5 . .	−30	32	24.5

Lacaille 444, $1^h\ 27^m\ 18^s$.

January	11 . .	−24	48	55.6

105 Piscium, $1^h\ 32^m\ 56^s$.

January	5 . .	+15	46	14.3

B. A. C. 527, $1^h\ 36^m\ 30^s$.

January	11 . .	−32	57	29.6

Lalande 3412, $1^h\ 45^m\ 49^s$.

January	5 . .	+36	42	18.0

γ Arietis, (2d *,) $1^h\ 46^m\ 30^s$.

January	11 . .	+18	40	48.1

γ Arietis, (1st *,) $1^h\ 46^m\ 30^s$.

January	11 . .	+18	40	57.7

56 Ceti, $1^h\ 50^m\ 49^s$.

January	14 . .	−23	8	18.6

B. A. C. 643, $1^h\ 58^m\ 55^s$.

January	5 . .	−29	53	50.7
	11 . .			50.8
	14 . .			52.7

η Arietis, $2^h\ 5^m\ 49^s$.

January	5 . .	+20	37	22.1

20 Arietis, $2^h\ 8^m\ 36^s$.

January	11 . .	+25	12	5.8
	14 . .			6.3

70 Ceti, $2^h\ 15^m\ 51^s$.

1875.		°	′	″
January	5 . .	− 1	27	17.7

κ Fornacis, $2^h\ 16^m\ 48^s$.

January	11 . .	−24	23	7.5
	14 . .			9.2

Weisse 437, $2^h\ 27^m\ 40^s$.

January	5 . .	− 6	33	22.4
	11 . .			24.2
	14 . .			25.8

O. Arg. S. 1655, $2^h\ 29^m\ 12^s$.

January	16 . .	−17	50	17.2
	22 . .			17.7

Lacaille 816, $2^h\ 33^m\ 52^s$.

January	5 . .	−26	6	34.3
	14 . .			34.8

μ Arietis, $2^h\ 35^m\ 19^s$.

January	16 . .	+19	28	39.5

Weisse (2) 972, $2^h\ 41^m\ 19^s$.

January	5 . .	+24	46	21.8

41 Arietis, $1^h\ 42^m\ 38^s$.

January	16 . .	+26	44	36.9
	22 . .			36.4

17 Persei, $2^h\ 43^m\ 49^s$.

January	11 . .	+34	32	37.5

(* 9.2), $2^h\ 48^m\ 30^s$.

January	25 . .	+ 7	58	53.3

Lacaille 922, $2^h\ 50^m\ 1^s$.

January	22 . .	−25	48	38.6

47 Arietis, $2^h\ 50^m\ 57^s$.

January	5 . .	+20	9	57.4

4 Eridani, $2^h\ 51^m\ 50^s$.

1875.		°	′	″
January	16 . .	−24	21	53.9

B. A. C. 940, $2^h\ 54^m\ 6^s$.

January	11 . .	−25	46	34.6

τ^3 Eridani, $2^h\ 56^m\ 53^s$.

January	22 . .	−24	6	58.1

(* 8.5), $2^h\ 58^m\ 42^s$.

January	5 . .	−23	37	57.5

Lacaille 988, $3^h\ 2^m\ 44^s$.

January	5 . .	−30	47	39.1
	16 . .			39.8

ζ Arietis, $3^h\ 7^m\ 43^s$.

January	22 . .	+20	34	46.8
	25 . .			47.4

15 Eridani, $3^h\ 12^m\ 52^s$.

January	5 . .	−22	58	8.5

τ^4 Eridani. $3^h\ 13^m\ 58^s$.

February	4 . .	−22	12	49.4

B. A. C. 1047, $3^h\ 15^m\ 25^s$.

January	5 . .	−27	3	33.3
	16 . .			33.8

B. A. C. 1073, $3^h\ 21^m\ 6^s$.

January	5 . .	−27	45	30.3
	16 . .			31.4

66 Arietis, $3^h\ 21^m\ 8^s$.

January	11 . .	+22	22	17.5

(* 7.0), $3^h\ 27^m\ 14^s$.

January	16 . .	+31	35	49.0
February	4 . .			49.5

(* 8.6), $3^h\ 27^m\ 36^s$.

1875.		°	′	″
January	22 . .	+31	17	6.7
	25 . .			7.9
February	1 . .			4.6

9 Tauri, $3^h\ 30^m\ 38^s$.

January	11 . .	+22	47	44.9

Lacaille 1196, $3^h\ 38^m\ 9^s$.

January	5 . .	−31	24	59.9
	14 . .		25	2.2

O. Arg. S. 2488, $3^h\ 38^m\ 27^s$.

January	11 . .	−22	19	58.7
	22 . .		20	0.4

(* 8.0), $3^h\ 39^m\ 10^s$.

January	16 . .	+23	14	1.4

B. A. C. 1165, $3^h\ 40^m\ 4^s$.

January	25 . .	+23	54	0.3

Weisse 751, $3^h\ 40^m\ 26^s$.

February	4 . .	+12	3	41.3

27 Pleiadum, $3^h\ 40^m\ 48^s$.

January	25 . .	+23	55	55.7

(* 7.0), $3^h\ 45^m\ 24^s$.

January	5 . .	−32	39	55.0
	11 . .			57.4

Weisse (2) 1030, $3^h\ 48^m\ 38^s$.

January	14 . .	+35	38	12.2
	22 . .			12.7
February	4 . .			13.2

(* 7.5), $3^h\ 49^m\ 36^s$.

February	1 . .	+36	7	47.4

Lacaille 1291, $3^h\ 51^m\ 8^s$.

January	25 . .	−30	1	26.2

1875.		°	′	″
τ^9 Eridani, $3^h\ 54^m\ 36^s$.				
February	13	−24	22	21.8
A¹ Tauri, $3^h\ 57^m\ 20^s$.				
January	5	+21	44	19.4
A² Tauri, $3^h\ 57^m\ 57^s$.				
January	11	+21	40	10.5
(* 8.3), $3^h\ 57^m\ 59^s$.				
January	22	+21	42	58.5
February	4			58.6
B. A. C. 1273, $4^h\ 0^m\ 29^s$.				
January	16	−27	59	44.0
(* 8.0), $4^h\ 2^m\ 24^s$.				
January	25	− 7	49	(0.7)
February	1			51.3
Weisse 24, $4^h\ 3^m\ 37^s$.				
January	14	+14	54	28.2
Rumker 1110, $4^h\ 5^m\ 22^s$.				
January	5	+16	57	15.2
	11			13.1
o^1 Eridani, $4^h\ 5^m\ 46^s$.				
February	13	− 7	9	56.8
(* 8.5), $4^h\ 6^m\ 16^s$.				
January	22	+44	27	45.7
February	1			46.6
Lalande 7817, $4^h\ 6^m\ 23^s$.				
January	22	+44	26	55.4
February	11			57.4
(* 9.2), $4^h\ 6^m\ 23^s$.				
February	4	− 6	50	11.0
Lalande 7833, $4^h\ 6^m\ 56^s$.				
February	17	+44	22	0.3
(* 8.2), $4^h\ 8^m\ 20^s$.				
January	14	−31	36	12.1
Weisse (2) 137, $4^h\ 9^m\ 27^s$.				
January	25	+44	22	30.4
February	17			29.7
Lalande 7994, $4^h\ 11^m\ 11^s$.				
January	11	+37	41	30.5

1875.		°	′	″
B. A. C. 1340, $4^h\ 14^m\ 30^s$.				
January	5	−25	19	37.5
	14			38.7
55 Persei, $4^h\ 16^m\ 23^s$.				
January	22	+33	50	20.0
February	1			18.2
(* 8.0), $4^h\ 17^m\ 18^s$.				
January	25	+16	35	45.3
February	13			43.0
(* 7.8), $4^h\ 18^m\ 8^s$.				
January	14	−20	33	50.1
February	4			52.5
	11			54.3
(* 9.2), $4^h\ 20^m\ 58^s$.				
January	22	+28	27	51.1
(* 8.2), $4^h\ 24^m$ 47s.				
February	17	+35	33	49.4
	22			47.8
B. A. C. 1404, $4^h\ 25^m\ 30^s$.				
January	11	−30	42	59.1
(* 8.2), $4^h\ 25^m\ 52^s$.				
January	14	+15	33	6.4
(* 9.2), $4^h\ 25^m\ 58^s$.				
January	22	+28	27	51.1
	25			(41.1)
February	1			52.0
	4			57.7
Weisse 554, $4^h\ 27^m\ 30^s$.				
February	11	+ 5	18	15.5
	13			16.7
v^7 Eridani, $4^h\ 30^m\ 43^s$.				
January	11	−30	49	12.0
(* 8.0), $4^h\ 32^m\ 38^s$.				
February	1	−27	1	53.8
	17			51.7
(* 6.0), $4^h\ 34^m$ 21.				
January	14	+38	11	4.3
(* 9.2), $4^h\ 35^m\ 8^s$.				
January	22	−25	53	32.4
	25			40.8
(* 9.2), $4^h\ 41^m\ 22^s$.				
February	17	+10	41	41.8
	22			43.7

1875.		°	′	″
(* 8.5), $4^h\ 41^m\ 25^s$.				
February	11	+10	42	22.5
	17			23.3
	22			24.0
(* 8.6), $4^h\ 41^m\ 38^s$.				
February	11	+10	43	19.9
	13			20.6
(* 9.0), $4^h\ 41^m\ 57^s$.				
February	4	+10	38	7.4
(* 9.0), $4^h\ 41^m\ 59^s$.				
February	4	+10	39	54.0
(* 8.0), $4^h\ 42^m\ 6^s$.				
January	11	−29	59	14.8
	14			14.3
(* 8.5), $4^h\ 42^m\ 46^s$.				
February	13	+10	44	34.9
(* 9.0), $4^h\ 46^m\ 50^s$.				
January	22	+43	57	56.0
O. Arg. S. 3513, $4^h\ 50^m\ 50^s$.				
January	14	−27	54	13.1
	25			13.5
Schjellerup 1589, $4^h\ 51^m\ 10^s$.				
February	13	+ 1	22	10.8
	17			6.3
Lacaille 1673, $4^h\ 54^m\ 12^s$.				
February	1	−28	37	57.5
	4			55.6
	11			56.2
Lacaille 1675, $4^h\ 54^m\ 37^s$.				
February	26	−32	25	48.1
(* 8.2), $4^h\ 56^m\ 37^s$.				
February	17	−31	34	39.1
(* 9.0), $4^h\ 56^m\ 47^s$.				
February	17	−31	35	17.3
(* 7.8), $4^h\ 57^m\ 33^s$.				
January	22	+44	33	31.3
February	22			30.9
O. Arg. S. 3630, $4^h\ 59^m\ 0^s$.				
January	14	−27	50	(15.0)
February	4			9.2

1875.		°	′	″
(* 8.3), $5^h\ 1^m\ 44^s$.				
January	25	+29	37	37.7
February	11			36.0
Weisse (2) 1414, $5^h\ 1^m\ 46^s$.				
January	25	+29	38	7.7
February	11			6.6
O. Arg. S. 3720 $5^h\ 4^m\ 21^s$.				
January	14	−25	32	34.7
(* 9.3), $5^h\ 6^m\ 2^s$.				
February	17	−25	35	6.9
	22			3.9
B. A. C. 1615, $5^h\ 6^m\ 41^s$.				
January	22	−30	22	44.9
(* 8.0), $5^h\ 8^m\ 49^s$.				
February	1	+30	14	13.4
B. A. C. 1641, $5^h\ 11^m\ 18^s$.				
March	4	−35	4	7.5
o Columbæ, $5^h\ 13^m\ 0^s$.				
February	17	−35	1	10.9
	26			10.4
March	4			12.2
Weisse (2) 430, $5^h\ 17^m\ 6^s$.				
January	22	+37	55	52.2
O. Arg. S. 3920, $5^h\ 18^m\ 38^s$.				
February	11	−16	9	34.6
(* 8.8), $5^h\ 19^m\ 12^s$.				
January	14	+39	3	33.1
February	1			(23.5)
	4			30.0
	13			28.6
(* 9.0), $5^h\ 21^m\ 16^s$.				
February	26	+38	53	58.1
B. A. C. 1713, $5^h\ 22^m\ 23^s$.				
February	17	−26	41	24.8
	22			25.1
Groombridge 980, $5^h\ 22^m\ 52^s$.				
January	25	+38	13	18.6
O. Arg. N. 5930, $5^h\ 24^m\ 39^s$.				
March	4	+70	16	44.7

(* 8.3) $5^h 27^m 2^s$.

1875.		° ′ ″
February	11	− 5 25 53.3
	13	52.2

(* 8.3), $5^h 27^m 48^s$.

January	14	− 5 41 39.1
	22	38.0

GROOMBRIDGE 990, $5^h 28^m 28^s$.

February	1	+51 21 39.1

θ ORIONIS, $5^h 29^m 7^s$.

February	26	− 5 28 27.1

θ ORIONIS, $5^h 29^m 7^s$.

February	26	− 5 28 20.2

(* 8.2), $5^h 34^m 57^s$.

February	22	+38 17 28.2

(* 8.0), $5^h 35^m 29^s$.

January	25	+38 11 18.7

(* 9.0), $5^h 35^m 40^s$.

January	22	+38 12 23.7
	25	24.2

O. ARG. S. 4213, $5^h 36^m 4^s$.

February	1	−29 47 12.9

(* 8.6), $5^h 37^m 42^s$.

February	17	+38 5 14.7
	22	16.5
March	4	15.6

LALANDE 10871, $5^h 39^m 35^s$.

February	4	+35 6 35.1
	26	34.4

LACAILLE 1977, $5^h 40^m 36^s$.

February	11	−31 43 17.3
	13	16.9

WEISSE 1034, $5^h 42^m 13^s$.

March	4	+ 9 50 (47.8)
	8	59.0

LACAILLE 1993, $5^h 42^m 54^s$.

March	10	−35 43 18.3

O. ARG. S. 4395, $5^h 47^m 3^s$.

January	22	−25 58 35.7

(* 8.5), $5^h 48^m 37^s$.

February	1	+72 26 34.3
	22	31.4

(* 7.8), $5^h 49^m 54^s$.

1875.		° ′ ″
February	11	−29 56 22.4

(* 8.2), $5^h 49^m 54^s$.

February	11	−29 59 30.3

O. ARG. S. 4453, $5^h 50^m 42^s$.

February	17	−28 58 27.7
	26	29.8

O. ARG, N. 6356, $5^h 50^m 52^s$.

January	25	+72 23 42.8
February	13	42.3

LACAILLE 2065, $5^h 51^m 17^s$.

March	8	−31 33 6.4

LACAILLE 2062, $5^h 51^m 24^s$.

February	4	−23 14 2.9

O. ARG. N. 6390, $5^h 53^m 18^s$.

March	4	+72 18 37.1

LACAILLE 2085, $5^h 53^m 23^s$.

March	10	−34 29 21.2

LACAILLE 2090, $5^h 54^m 27^s$.

January	22	−34 22 8.0

LACAILLE 2092, $5^h 54^m 37^s$.

February	17	−33 49 45.5

RUMKER 1680, $5^h 56^m 6^s$.

February	1	+26 21 7.9

(* 9.0), $5^h 59^m 47^s$.

February	13	−28 35 14.0

LALANDE 11529, $5^h 59^m 50^s$.

February	4	+37 59 43.9
	26	42.0

(* 9.0), $5^h 59^m 57^s$.

March	8	+20 7 43.0
	10	48.0

(* 9.0), $5^h 59^m 58^s$.

February	22	+37 58 29.6

LACAILLE 2130, $6^h 1^m 17^s$.

March	13	−29 44 45.9

(* 9.0), $6^h 2^m 25^s$.

1875.		° ′ ″
February	1	+31 26 31.4

WEISSE (2) 79, $6^h 5^m 24^s$.

February	17	+31 26 29.0
	22	25.1

(* 9.0), $6^h 7^m 30^s$.

March	4	+38 53 5.4
	8	8.8
	10	(11.6)

LACAILLE 2027, $6^h 11^m 8^s$.

March	13	−29 44 51.4
	16	54.1

κ COLUMBÆ, $6^h 12^m 8^s$.

February	4	−35 5 58.9
	13	6 2.3
	26	2.8

LALANDE 12053, $6^h 13^m 3^s$.

February	1	+21 8 31.5

(* 8.5), $6^h 15^m 29^s$.

February	17	−29 33 37.2
	22	38.2
March	8	37.6
	10	(33.3)

LACAILLE 2232, $6^h 16^m 9^s$.

March	13	−29 36 43.1

LALANDE 12134, $6^h 16^m 6^s$.

February	11	+37 22 40.6
March	4	38.9

LACAILLE 2271, $6^h 20^m 53^s$.

March	13	−29 37 55.4
	16	58.5

11 MONOCEROTIS (1st *), $6^h 22^m 46^s$.

February	26	− 6 57 18.0

11 MONOCEROTIS (2d *), $6^h 22^m 46^s$.

February	26	− 6 57 24.0

O. ARG. S. 5176, $6^h 24^m 7^s$.

February	13	−25 48 17.6
	17	17.6
	22	18.3

ξ^1 CANIS MAJORIS, $6^h 26^m 39^s$.

March	8	−23 19 48.4
	10	50.0

(* 8.3), $6^h 27^m 16^s$.

1875.		° ′ ″
March	4	−31 9 41.6

LACAILLE 2323, $6^h 27^m 47^s$.

March	13	−27 18 56.8
	16	56.9

LACAILLE 2342, $6^h 30^m 16^s$.

March	18	−25 44 28.7

O. ARG. S. 5343, $6^h 30^m 56^s$.

February	1	−24 1 4.4
	11	4.7

LALANDE 12805, $6^h 34^m 36^s$.

February	17	+32 40 32.2
	22	33.0
	26	33.6

LALANDE 12798, $6^h 34^m 46^s$.

February	4	+37 15 56.4
	13	56.1

O. ARG. S. 5543, $6^h 37^m 19^s$.

March	4	−23 13 (51.6
	8	48.4
	10	46.3

(* 9.0), $6^h 37^m 47^s$.

February	1	−23 16 44.1

O. ARG. S. 5615, $6^h 39^m 52^s$.

March	3	−27 13 25.5
	16	27.9

(* 8.0), $6^h 40^m 25^s$.

February	17	−31 31 33.3
	22	33.8

O. ARG. S. 5704, $6^h 42^m 59^s$.

February	4	−26 23 51.8
	11	51.3

LACAILLE 2454, $6^h 43^m 41^s$.

March	18	−28 4 31.7

(* 8.2), $6^h 43^m 49^s$.

March	8	−28 36 37.8

O. ARG. S. 5745, $6^h 44^m 35^s$.

March	8	−28 30 41.0

(* 8.0), $6^h 46^m 10^s$.

February	1	−28 33 43.0
	13	42.6
March	4	43.4

(* 9.0), 6^h 46^m 15^s.

1875.		°	′	″
February	1 . .	−28	35	18.6
March	4 . .			19.5

(* 8.5), 6^h 48^m 31^s.

March	13 . .	−24	13	53.5

(* 8.8), 6^h 49^m 27^s.

February	17 . .	−28	47	26.2
	22 . .			25.8

(* 8.5), 6^h 50^m 10^s.

February	4 . .	−31	32	40.0

O. Arg. S. 5906, 6^h 50^m 21^s.

March	10 . .	−28	52	40.5
	16 . .			37.9
	18 . .			36.1

(* 8.3), 6^h 52^m 16^s.

February	11 . .	−30	43	(53.0)
March	22 . .			46.8

O. Arg. S. 6004, 6^h 54^m 10.

March	18 . .	−28	47	30.5

(* 8.0), 6^h 54^m 52^s.

February	1 . .	−23	42	51.1
	13 . .			51.0
March	8 . .			48.5

6^h 55^m 27^s.

March	8 . .	−23	41	7.9

(* 9.0), 6^h 56^m 26^s.

March	4 . .	−30	27	5.5

(* 9.0), 6^h 56^m 30^s.

March	4 . .	−30	26	20.1
	13 . .			14.8

22 Canis Majoris, 6^h 56^m 44^s.

February	26 . .	−27	45	27.8

γ Canis Majoris, 6^h 58^m 7^s.

March	25 . .	−15	26	59.3

(* 9.5), 7^h 1^m 37^s.

February	11 . .	−14	42	43.3

(* 8.5), 7^h 2^m 26^s.

February	1 . .	−26	8	33.8
	4 . .			32.0

(* 9.0), 7^h 2^m 28^s.

March	22 . .	−14	37	29.4

Lacaille 2623, 7^h 2^m 31^s.

1875.		°	′	″
February	1 . .	−26	9	53.1

(* 8.5), 7^h 2^m 37^s.

March	22 . .	−14	41	19.4

(* 9.0), 7^h 2^m 45^s.

February	13 . .	−14	41	27.6
	17 . .			20.4
	22 . .			23.7

O. Arg. S. 6343, 7^h 5^m 41^s.

March	8 . .	−30	27	32.1
	13 . .			30.1
	16 . .			36.0

(* 8.2), 7^h 5^m 53^s.

March	25 . .	−14	48	36.5

Weisse 196, 7^h 7^m 35^s.

February	4 . .	−14	22	8.5

B. A. C. 2383, 7^h 9^m 19^s.

March	10 . .	+26	54	44.4

(* 9.0), 7^h 9^m 24^s.

March	4 . .	+41	45	19.8

Weisse 274, 7^h 10^m 10^s.

February	17 . .	−14	16	47.9
	22 . .			48.9
March	22 . .			45.5

(* 8.3), 7^h 10^m 20^s.

February	1 . .	−23	29	16.4
	11 . .			24.3

Weisse 283, 7^h 10^m 24^s.

March	22 . .	−14	17	28.7

Weisse (2) 327, 7^h 11^m 56^s.

February	26 . .	+22	15	1.7

(* 9.0), 7^h 13^m 1^s.

March	8 . .	+25	12	48.3

(* 8.0), 7^h 13^m 23^s.

March	13 . .	−29	39	30.2
	16 . .			33.6

(* 8.5), 7^h 13^m 26^s.

March	8 . .	+25	13	47.7

(* 8.5), 7^h 15^m 18^s.

February	4 . .	−14	27	44.0
March	25 . .			47.7

(*8.5), 7^h 15^m 52^s.

1875.		°	′	″
March	10 . .	+45	5	24.4

(* 7.3), 7^h 17^m 16^s.

February	13 . .	−24	39	59.4

η Canis Majoris, 7^h 19^m 10^s.

February	17 . .	−29	3	40.3
	22 . .			38.7

O. Arg. S. 6754, 7^h 19^m 14^s.

February	1 . .	−18	46	47.2
March	4 . .			45.1

(* 6.0), 7^h 19^m 21^s.

March	4 . .	−18	46	8.2

β Canis Minoris, 7^h 20^m 24^s.

February	11 . .	+ 8	32	22.3
	26 . .			22.0

(* 9.2), 7^h 21^m 13^s.

March	13 . .	+15	32	53.9

Lalande 14473, 7^h 21^m 37^s.

February	4 . .	+41	6	7.0

Weisse (2) 625, 7^h 23^m 25^s.

March	16 . .	+40	42	45.0

(* 8.2), 7^h 23^m 29^s.

March	22 . .	−14	46	43.1

Weisse (2) 667, 7^h 24^m 10^s.

March	25 . .	+15	30	41.9

(* 8.7), 7^h 24^m 32^s.

March	8 . .	−20	32	21.8

Weisse (2) 682, 7^h 24^m 32^s.

March	25 . .	+15	34	29.4

(* 7.8), 7^h 25^m 3^s.

March	8 . .	−20	32	52.6

Weisse (2) 727, 7^h 26^m 0^s.

February	13 . .	+16	14	51.8
	22 . .			51.9

Weisse (2) 730, 7^h 26^m 44^s.

February	11 . .	+41	44	8.2

Weisse (2) 840, 7^h 29^m 50^s.

February	17 . .	+21	38	59.9
March	4 . .		39	0.1
	13 . .			2.1

O. Arg. S. 7063, 7^h 29 50^s.

1875.		°	′	″
February	1 . .	−29	8	14.9

o Geminorum, 7^h 31^m 1^s.

March	10 . .	+34	52	6.5

(* 8.0), 7^h 34^m 14^s.

February	26 . .	+10	24	56.1
March	22 . .			56.9

(* 8.0), 7^h 34^m 49^s.

February	22 . .	−14	21	22.9
March	8 . .			22.1

(*), 7^h 42^m 36^s.

March	4 . .	−23	53	58.0

(* 8.5), 7^h 42^m 50^s.

March	13 . .	−23	27	29.2
	22 . .			29.8

B. A. C. 2599, 7^h 43^m 48^s.

April	5 . .	−24	36	5.0
	6 . .			4.9

ξ Navis, 7^h 44^m 2^s.

February	17 . .	−24	32	50.6
	22 . .			53.2
	26 . .			52.2

(* 9.0), 7^h 45^m 52^s.

March	8 . .	+ 0	26	33.0
	25 . .			37.8

Lacaille 3061, 7^h 50^m 0^s.

March	13 . .	−31	12	23.8
	22 . .			24.4

(* 9.0), 7^h 51^m 30^s.

February	26 . .	−30	32	11.2

Lacaille 3093, 7^h 54^m 3^s.

April	5 . .	−36	40	33.9
	6 . .			35.1

(* 9.0), 7^h 54^m 6^s.

March	4 . .	−30	0	17.6

8 Cancri, 7^h 58^m 8^s.

March	13 . .	+13	28	23.0
	22 . .			22.1
	25 . .			20.6

Lacaille 3168, 8^h 4^m 6^s.

March	8 . .	−37	19	0.4
	25 . .			0.5
April	5 . .			0.1
	6 . .			1.4

B. A. C. 2749, S. P., $8^h\ 6^m\ 54^s$.

1875. ° ′ ″
August 21 . . +72 47 33.8
25 . . 32.0

LACAILLE 3192, $8^h\ 7^m\ 43^s$.

February 22 . . −29 32 16.1
26 . . 15.6

LACAILLE 3209, $8^h\ 8^m\ 41^s$.

March 22 . . −31 21 49.1

LACAILLE 3257, $8^h\ 13^m\ 32^s$.

March 13 . . −35 3 44.3
April 5 . . 46.9
6 . . 47.0

31 LYNCIS, $8^h\ 14^m\ 17^s$.

March 4 . . +43 35 12.5
8 . . 11.7
25 . . 12.5

(* 6.5), $8^h\ 21^m\ 2^s$.

April 5 . . −26 44 4.5
6 . . 4.4

B. A. C. 2846, $8^h\ 22^m\ 36^s$.

April 14 . . −25 43 14.1

O. ARG. S. 8610, $8^h\ 24^m\ 12^s$.

February 22 . . −29 57 6.4
March 13 . . 5.0
22 . . 3.8

(* 8.5), $8^h\ 27^m\ 25^s$.

April 6 . . +24 26 13.7

(* 7.5), $8^h\ 28^m\ 51^s$.

April 5 . . +24 28 49.6

(* 8.5), $8^h\ 29^m\ 11^s$.

March 25 . . +27 34 39.9

(* 7.2), $8^h\ 30^m\ 38^s$.

March 8 . . − 9 16 52.5

δ HYDRÆ, $8^h\ 31^m\ 2^s$.

April 14 . . + 6 8 13.9
20 . . 16.0

O. ARG. S. 8806, $8^h\ 33^m\ 0^s$.

March 13 . . −25 59 45.8
22 . . 45.4

(*), $8^h\ 34^m\ 30^s$.

March 25 . . +20 36 10.6

(* 8.5), $8^h\ 35^m\ 16^s$.

1875. ° ′ ″
April 6 . . −31 43 42.5

B. A. C. 2930, $8^h\ 37^m\ 11^s$.

August 21 . . +80 28 37.3
25 . . 35.8

35 LYNCIS, $8^h\ 43^m\ 34^s$.

April 20 . . +44 11 22.3

(* 9.0), $8^h\ 44^m\ 47^s$.

April 5 . . −41 15 20.1

(* 8.5), $8^h\ 45^m\ 14^s$.

March 8 . . −41 16 40.6

(* 8.5), $8^h\ 49^m\ 26^s$.

March 22 . . −34 56 14.1
25 . . 14.6

(*), $8^h\ 49^m\ 50^s$.

March 13 . . −35 1 45.8

(* 8.5), $8^h\ 50^m\ 1^s$.

April 14 . . −32 56 56.3

LACAILLE 3595, $8^h\ 50^m\ 21^s$.

April 14 . . −32 55 29.5

WEISSE (2) 1252, $8^h\ 51^m\ 48^s$.

April 6 . . +21 38 59.7

B. A. C. 3070, $8^h\ 53^m\ 58^s$.

April 8 . . −28 19 20.6

B. A. C. 3082, $8^h\ 55^m\ 47^s$.

April 5 . . −26 10 22.3
20 . . 23.8
21 . . 23.0

LACAILLE 3643, $8^h\ 56^m\ 25^s$.

March 25 . . −26 4 58.9

O. ARG. S. 9276, $8^h\ 57^m\ 24^s$.

March 22 . . −30 31 30.6

ξ CANCRI, $9^h\ 2^m\ 11^s$.

April 22 . . +22 32 58.7

B. A. C. 3121, $9^h\ 2^m\ 36^s$.

April 6 . . −25 21 19.0
23 . . 19.0

LACAILLE 3690, $9^h\ 3^m\ 2^s$.

April 6 . . −25 20 3.9

20 HYDRÆ, $9^h\ 3^m\ 30^s$.

1875. ° ′ ″
April 8 . . − 8 16 53.4

O. ARG. S. 9418, $9^h\ 4^m\ 16^s$.

April 21 . . −29 18 39.5

36 LYNCIS, $9^h\ 5^m\ 28^s$.

April 20 . . +43 43 51.6

WEISSE (2) 81, $9^h\ 5^m\ 46^s$.

March 22 . . +20 33 (25.8)
25 . . 38.5
April 5 . . 34.1
14 . . 37.7

WEISSE (2) 79, $9^h\ 5^m\ 48^s$.

March 8 . . +20 32 (11.7)
22 . . 6.0
25 . . 7.4

LALANDE 18288, $9^h\ 10^m\ 43^s$.

April 21 . . +35 53 13.1

B. A. C 3174, $9^h\ 12^m\ 3^s$.

April 23 . . −38 52 43.6

α LYNCIS, $9^h\ 13^m\ 28^s$.

April 6 . . +34 55 10.6
22 . . 9.7

(* 9.0), $9^h\ 14^m\ 46^s$.

March 22 . . −28 43 51.1
25 . . (42.2)

(*), $9^h\ 15^m\ 3^s$.

April 8 . . −28 35 50.4

(* 7.5), $9^h\ 16^m\ 4^s$.

April 5 . . −34 49 38.3

WEISSE 337, $9^h\ 17^m\ 1^s$.

April 14 . . −14 57 36.6

(* 7.8), $9^h\ 17^m\ 42^s$.

April 20 . . −34 59 10.7
21 . . 10.2

LACAILLE 3834, $9^h\ 21^m\ 22^s$.

April 23 . . −33 21 19.0

ω LEONIS, $9^h\ 21^m\ 37^s$.

April 22 . . + 9 35 59.6

λ LEONIS, $9^h\ 24^m\ 37^s$.

April 6 . . +23 31 4.6
8 . . 5.1

(* 8.5), $9^h\ 25^m\ 28^s$.

1875. ° ′ ″
March 22 . . −36 5 41.3
25 . . 38.2

LACAILLE 3905, $9^h\ 28^m\ 15^s$.

April 5 . . −38 5 9.7
14 . . 9.6

B. A. C. 3296, $9^h\ 31^m\ 47^s$.

April 22 . . −31 37 3.9

O. ARG. S. 9938, $9^h\ 32^m\ 11^s$.

April 21 . . −27 52 30.5

LACAILLE 3946, $9^h\ 32^m\ 16^s$.

April 23 . . −35 32 7.7

(* 8.5), $9^h\ 33^m\ 6^s$.

March 22 . . −29 54 25.5

B. A. C. 3306, $9^h\ 33^m\ 37^s$.

April 14 . . −39 2 57.3

(* 8.0), $9^h\ 34^m\ 0^s$.

April 14 . . +38 57 51.2
20 . . 52.8

ψ LEONIS, $9^h\ 36^m\ 57^s$.

April 29 . . +14 35 31.2

WEISSE (2) 817, $9^h\ 39^m\ 43^s$.

March 25 . . +27 44 5.1
April 23 . . 3.6

(*8.0), $9^h\ 40^m\ 18^s$.

April 5 . . −37 9 32.2

15 LEONIS MINORIS, $9^h\ 40^m\ 34^s$.

April 6 . . +46 36 8.1
22 . . 8.0

(* 6.5), $9^h\ 40^m\ 44^s$.

April 8 . . +12 8 44.4

(* 8.0), $9^h\ 42^m\ 7^s$.

April 5 . . −37 8 43.4

(* 7.5), $9^h\ 42^m\ 22^s$.

April 20 . . −37 36 41.1

(* 7.5), $9^h\ 44^m\ 48^s$.

March 22 . . +18 4 0.6

WEISSE 960, $9^h\ 46^m\ 31^s$.

April 21 . . +17 59 36.4

B. A. C. 3385, 9h 47m 22s.

1875.		° ′ ″
April	22	−26 44 53.1
	29	55.6

(*8.5), 9h 47m 51s.

March	25	+19 25 31.9

B. A. C. 3391, 9h 48m 33s.

April	6	−25 20 42.5
	23	42.0

RUMKER 3002, 9h 48m 40s.

April	20	+19 24 47.3

B. A. C. 3405, 9h 51m 8s.

April	5	−32 49 34.6

LACAILLE 4089, 9h 53m 8s.

April	14	−28 42 29.5

LACAILLE 4095, 9h 53m 31s.

April	8	−35 17 37.4

(* 8.2), 9h 55m 52s.

April	20	−38 46 56.6
	21	52.3

WEISSE (2) 1172, 9h 56m 27s.

April	29	+38 37 38.9

LACAILLE 4111, 9h 56m 34s.

April	23	−33 34 20.4

LACAILLE 4115, 9h 57m 14s.

April	22	−29 58 31.8

η LEONIS, 10h 0m 34s.

April	6	+17 22 16.3

GROOMBRIDGE 1616, 10h 2m 22s.

March	25	+50 7 15.2
April	8	15.3
	14	13.4

GROOMBRIDGE 1618, 10h 3m 44s.

March	25	+50 5 8.1

WEISSE 94, 10h 7m 19s.

April	21	+12 18 26.4

B. A. C. 3489, 10h 7m 34s.

April	22	−26 24 43.8

(* 8.5), 10h 7m 26s.

April	5	−29 48 42.8
	29	44.1

γ² LEONIS, 10h 13m 6s.

1875.		° ′ ″
April	20	+20 28 21.1
	23	21.2

LACAILLE 4250, 10h 14m 36s.

April	22	−32 30 4.8

LALANDE 20114, 10h 15m 37s.

April	29	−23 4 57.3

43 LEONIS, 10h 16m 30s.

April	6	+ 7 10 36.0
	8	36.8

30 LEONIS MAJORIS, 10h 18m 46s.

April	5	+34 25 54.5
	8	54.8

LACAILLE 4286, 10h 19m 39s.

April	23	−28 33 37.6

μ HYDRÆ, 10h 20m 4s.

April	14	−16 11 56.8
	21	56.3

O. ARG. N. 10874, 10h 22m 29s.

April	29	+56 38 10.5

(* 7.5), 10h 22m 42s.

April	20	−35 34 55.7

B. A. C. 3596, 10h 23m 43s.

April	22	−29 1 29.9

34 LEONIS MINORIS, 10h 26m 24s.

April	5	+35 37 54.7
	6	54.7

(* 9.2), 10h 26m 41s.

April	21	+17 33 19.9

35 LEONIS MINORIS, 10h 29m 14s.

April	8	+36 58 28.1

(* 9.0), 10h 29m 25s.

April	14	− 3 57 33.2

37 LEONIS MINORIS, 10h 31m 44s.

April	23	+32 37 29.4

33 SEXTANTIS, 10h 35m 5s.

April	6	− 1 5 6.2

WEISSE 608, 10h 35m 15s.

1875.		° ′ ″
April	20	+14 35 (34.6)
	21	23.0
	22	23.2

B. A. C. 3677, 10h 36m 57s.

May	10	−32 3 40.9
	11	42.1
	12	41.4

(* 9.0), 10h 37m 3s.

April	29	−35 50 32.2

WEISSE (2) 776, 10h 39m 14s.

April	23	+36 17 41.7

37 SEXTANTIS, 10h 39m 36s.

April	14	+ 7 1 52.4

k LEONIS, 10h 39m 49s.

May	14	+14 51 14.6

WEISSE 716, 10h 41m 30s.

April	5	+12 33 3.8

39 SEXTANTIS, 10h 42m 42s.

April	6	− 8 26 20.9
	8	21.3

B. A. C. 3726, 10h 45m 50s.

April	14	+ 1 41 16.6
	20	18.7

O. ARG. S. 10936, 10h 46m 17s.

April	21	−29 24 59.0

(* 8.5), 10h 47m 18s.

April	23	− 0 41 29.8

WEISSE 859, 10h 48m 14s.

April	29	− 0 51 10.7
May	10	9.8

B. A. C. 3737, 10h 48m 19s.

May	12	+ 6 30 46.5

B. A. C. 3755, 10h 50m 54s.

April	22	−36 27 59.5

LALANDE 21081, 10h 52m 44s.

April	6	+36 45 50.2
	8	50.9

WEISSE 957, 10h 54m 12s.

1875.		° ′ ″
April	5	+ 4 24 38.6
May	11	39.2

B. A. C. 3773, 10h 54m 40s.

April	14	+ 0 43 3.3
	20	3.3

α URSÆ MAJORIS, S. P., 10h 56m 2s.

September	23	+62 25 30.1

B. A. C. 3778, 10h 56m 22s.

April	23	−26 9 19.7
	29	20.7

(* 8.0), 10h 57m 40s.

April	21	+ 0 38 32.7
May	10	35.2

WEISSE (2) 1185, 1h 0m 11s.

May	12	+37 24 44.9

*p*³ LEONIS, 11h 0m 33s.

April	22	+ 2 38 1.7
May	17	3.0

(*), 11h 1m 16s.

April	8	−32 52 42.9

(* 8.5), 11h 2m 7s.

April	20	−40 15 36.3

LACAILLE 4633, 11h 4m 36s.

May	14	−31 53 9.1

O. ARG. S. 11213, 11h 4m 44s.

May	10	−28 53 42.6
	11	42.2

*p*⁵ LEONIS, 11h 7m 20s.

April	6	+ 0 36 36.8
	14	35.8

O. ARG. S. 11250, 11h 8m 33s.

May	12	−25 23 36.9

O. ARG. N. 11590, 11h 8m 41s.

April	29	+69 53 59.8

O. ARG. N. 11619, 11h 9m 49s.

April	21	+69 52 18.4

φ LEONIS, 11h 10m 20s.

April	8	− 2 58 5.4
	22	7.1

ξ URSÆ MAJORIS, $11^h 11^m 33^s$.

1875.		°	′	″
May	17 . .	+32	13	57.0

O. ARG. S. 11318, $11^h 14^m 15^s$.

May	14 . .	−27	38	54.4

(* 9.2), $11^h 14^m 54^s$.

May	10 . .	+38	12	26.1

WEISSE (2) 257 (1st *), $11^h 15^m 23^s$.

May	11 . .	+37	46	2.3

WEISSE (2) 257 (2d *), $11^h 15^m 23^s$.

May	11 . .	+37	46	28.1

WEISSE (2) 266, $11^h 15^m 59^s$.

April	23 . .	+35	42	40.4

B. A. C. 3875, $11^h 17^m 9^s$.

April	14 . .	−35	28	45.1
	20 . .			46.6

ι LEONIS, $11^h 17^m 26^s$.

April	8 . .	+11	13	3.4
	22 . .			2.8
May	25 . .			5.4

80 LEONIS, $11^h 19^m 26^s$.

April	29 . .	+ 4	32	52.5
May	17 . .			55.9

RUMKER 3575, $11^h 19^m 59^s$.

April	21 . .	+18	32	53.3

B. A. C. 3917, $11^h 25^m 0^s$.

May	11 . .	+ 3	45	8.4
	12 . .			7.7

LALANDE 21902, $11^h 25^m 32^s$.

April	14 . .	+36	56	15.9
	20 . .			16.4

LACAILLE 4773, $11^h 26^m 21^s$.

April	8 . .	−28	27	7.9
	21 . .			7.3

B. A. C. 3928, $11^h 26^m 52^s$.

April	22 . .	−31	9	58.8
	23 . .			57.8
May	17 . .			56.8

O. ARG. N. 11873, $11^h 27^m 56^s$.

May	10 . .	+71	29	29.1

WEISSE (2) 511, $11^h 28^m 33^s$.

1875.		°	′	″
April	29 . .	+16	42	5.6

O. ARG. N. 11901, $11^h 30^m 6^s$.

May	12 . .	+71	14	48.8

O. ARG. S. 11531, $11^h 32^m 2^s$.

April	20 . .	−24	53	54.3
May	11 . .			52.3

WEISSE (2) 608, $11^h 32^m 24^s$.

May	14 . .	+17	47	39.2

CARRINGTON 1741, $11^h 34^m 18^s$.

April	21 . .	+81	16	22.5

B. A. C. 3969, $11^h 35^m 42^s$.

May	10 . .	−31	48	16.9

B. A. C. 3974, $11^h 37^m 14^s$.

May	12 . .	−36	29	43.4

LACAILLE 4867, $11^h 37^m 44^s$.

April	8 . .	−29	3	18.6
	22 . .			19.2

(* 8.5), $11^h 38^m 18^s$.

April	23 . .	+38	36	59.6
	29 . .		37	0.6

LACAILLE 4886, $11^h 40^m 52^s$.

May	14 . .	−35	12	41.6

WEISSE (2) 812, $11^h 42^m 33^s$.

April	20 . .	+15	12	4.3
	21 . .			3.5

B. A. C. 4015, $11^h 46^m 36^s$.

April	8 . .	−33	12	45.1
	22 . .			45.1
	23 . .			45.4

B. A. C. 4016, $11^h 47^m 3^s$.

May	12 . .	−34	22	12.3
	14 . .			13.1

B. A. C. 4021, $11^h 47^m 42^s$.

May	10 . .	+ 5	34	28.9
	11 . .			28.2

(* 9.0), $11^h 49^m 18^s$.

May	17 . .	+11	3	0.1

WEISSE (2) 1013, $11^h 52^m 54^s$.

April	8 . .	+33	51	47.7
	21 . .			47.3

WEISSE (2) 1079, $11^h 56^m 0^s$.

1875.		°	′	″
April	23 . .	+43	50	12.6
	29 . .			12.6

WEISSE (2) 1086, $11^h 56^m 12^s$.

April	23 . .	+43	47	52.8
	29 . .			51.5

O. ARG. S. 11850, $11^h 56^m 16^s$.

May	10 . .	−25	40	(0.0)
	11 . .			10.8

WEISSE 947, $11^h 56^m 21^s$.

April	20 . .	+ 8	31	12.1
	22 . .			11.7

B. A. C. 4993, $11^h 57^m 18^s$.

May	19 . .	−38	18	43.5

WEISSE (2) 1190, $12^h 1^m 2^s$.

April	21 . .	+37	42	39.5

B. A. C. 4095, $12^h 3^m 37^s$.

May	14 . .	−34	0	31.4

LACAILLE 5044, $12^h 4^m 1^s$.

April	20 . .	−24	15	47.5

O. ARG. S. 11982, $12^h 5^m 33^s$.

April	29 . .	−25	14	44.0
May	25 . .			41.4

LACAILLE 5063, $12^h 6^m 46^s$.

May	10 . .	−33	25	47.5
	11 . .			49.1
	12 . .			49.0

LACAILLE 5065, $12^h 6^m 56^s$.

May	17 . .	−38	13	59.3

12 VIRGINIS, $12^h 7^m 6^s$.

May	19 . .	+10	57	28.1
	31 . .			30.8

B. A. C. 4128, $12^h 10^m 15^s$.

April	22 . .	+33	45	36.7

RUMKER 3911, $12^h 13^m 34^s$.

April	21 . .	+ 6	22	53.7

O. ARG. S. 12101, $12^h 14^m 47^s$.

May	17 . .	−26	2	16.0

12 COMÆ, $12^h 16^m 14^s$.

May	25 . .	+26	32	26.8
	31 . .			26.1

LACAILLE 5125, $12^h 16^m 31^s$.

1875.		°	′	″
April	29 . .	−24	10	46.1
May	10 . .			42.7

6 CORVI, $12^h 16^m 52^s$.

April	29 . .	−24	8	49.2
May	10 . .			46.3

WEISSE (2) 348, $12^h 17^m 48^s$.

May	25 . .	+26	32	43.6

RADCLIFFE 2857, $12^h 18^m 24^s$.

May	12 . .	+64	29	5.5

LACAILLE 5143, $12^h 18^m 46^s$.

April	23 . .	−25	17	42.9

RADCLIFFE 2860, $12^h 19^m 17^s$.

May	12 . .	+64	29	40.0

LACAILLE 5144, $12^h 19^m 47^s$.

May	19 . .	−27	3	22.8

B. A. C. 4202, $12^h 21^m 46^s$.

May	11 . .	−38	20	56.4

B. A. C. 4214, $12^h 23^m 45^s$.

May	31 . .	−23	0	16.6

LACAILLE 5191, $12^h 25^m 30^s$.

May	14 . .	−31	50	36.6

(*8.5), $12^h 26^m 55^s$.

May	10 . .	−31	45	45.9

q VIRGINIS, $12^h 27^m 21^s$.

May	19 . .	− 8	45	43.5

WEISSE (2) 556, $12^h 27^m 23^s$.

April	23 . .	+24	58	23.7

O. ARG. S. 12254, $12^h 28^m 30^s$.

May	17 . .	−22	47	11.4

B. A. C. 4253, $12^h 31^m 5^s$.

May	31 . .	−26	26	49.0

B. A. C. 4262, $12^h 33^m 9^s$.

May	14 . .	−39	17	58.1

LALANDE 23654, $12^h 33^m 17^s$.

May	11 . .	+34	53	57.9
	12 . .			56.4

1875.		°	′	″
Lalande 23666, 12^{h} 34^{m} 7^{s}.				
April	23	+34	51	10.9
May	10			11.7
28 Virginis, 12^{h} 35^{m} 31^{s}.				
April	29	− 6	48	47.2
June	4			45.8
(*), 12^{h} 36^{m} 14^{s}.				
May	25	− 4	45	35.3
Lacaille 5278, 12^{h} 40^{m} 3^{s}.				
May	19	−32	37	50.3
35 Virginis, 12^{h} 41^{m} 33^{s}.				
May	12	+ 4	15	18.7
O. Arg. S. 12444, 12^{h} 42^{m} 28^{s}.				
May	11	−25	10	52.6
(* 9.0), 12^{h} 42^{m} 39^{s}.				
April	29	+18	24	55.2
Lalande 23919, 12^{h} 43^{m} 18^{s}.				
May	25	+36	0	15.8
Lacaille 5301, 12^{h} 45^{m} 2^{s}.				
May	14	−30	24	12.1
Lacaille 5302, 12^{h} 45^{m} 7^{s}.				
May	31	−30	31	14.4
(* 8.5), 12^{h} 45^{m} 55^{s}.				
May	10	−38	37	55.4
38 Virginis, 12^{h} 46^{m} 49^{s}.				
May	17	− 2	52	22.7
June	4			23.9
ψ Virginis, 12^{h} 47^{m} 52^{s}.				
May	19	− 8	51	34.6
k Virginis, 12^{h} 53^{m} 15^{s}.				
May	12	− 3	8	14.5
	14			13.5
	17			11.7
June	4			14.1
(* 7.8), 12^{h} 53^{m} 39^{s}.				
May	25	+69	22	52.7
37 Comæ, 12^{h} 54^{m} 19^{s}.				
May	31	+31	27	36.5

1875.		°	′	″
Groombridge 1947, 12^{h} 54^{m} 27^{s}.				
May	25	+69	27	4.8
Lacaille 5367, 12^{h} 55^{m} 37^{s}.				
May	19	−27	36	48.3
(* 8.4), 12^{h} 57^{m} 28^{s}.				
May	10	−16	56	48.3
	17			51.1
O. Arg. S. 12626, 12^{h} 58^{m} 28^{s}.				
May	11	−14	49	31.2
B. A. C. 4378, 12^{h} 59^{m} 40^{s}.				
June	4	−40	55	5.1
g Virginis, 13^{h} 1^{m} 22^{s}.				
June	10	−10	4	18.7
ψ Hydræ, 13^{h} 2^{m} 21^{s}.				
May	12	−22	26	55.2
	14			57.2
B. A. C. 4405, 13^{h} 4^{m} 2^{s}.				
May	25	−41	33	53.0
	31			56.1
Lalande 24579, 13^{h} 7^{m} 53^{s}.				
May	19	+37	33	3.2
B. A. C. 4437, 13^{h} 9^{m} 57^{s}.				
June	4	−30	50	38.7
γ Hydræ, 13^{h} 12^{m} 9^{s}.				
May	11	−22	30	41.1
	12			39.2
	14			41.7
62 Virginis, 13^{h} 13^{m} 48^{s}.				
May	19	−10	38	45.7
(* 8.8), 13^{h} 14^{m} 22^{s}.				
May	17	+12	54	23.2
(* 9.0), 13^{h} 15^{m} 31^{s}.				
May	25	+38	28	13.1
(* 8.0), 13^{h} 19^{m} 56^{s}.				
May	11	−34	59	10.2
i Virginis, 13^{h} 20^{m} 8^{s}.				
May	14	−12	3	23.7
	31			20.6
June	4			23.6

1875.		°	′	″
g Ursæ Majoris, 13^{h} 20^{m} 14^{s}.				
May	22	+55	38	22.8
Lacaille 5553, 13^{h} 21^{m} 10^{s}.				
May	19	−25	45	10.6
(* 8.3), 13^{h} 21^{m} 29^{s}.				
May	17	−32	50	25.4
(* 8.8), 13^{h} 25^{m} 22^{s}.				
May	25	+61	53	56.2
75 Virginis, 13^{h} 26^{m} 12^{s}.				
June	16	−14	43	11.8
h Virginis, 13^{h} 26^{m} 24^{s}.				
June	10	− 9	31	13.2
(* 8.0), 13^{h} 26^{m} 32^{s}.				
May	31	− 1	46	46.7
June	4			50.5
(* 9.5), 13^{h} 29^{m} 35^{s}.				
May	11	+ 7	12	6.2
B. A. C. 4541 (1st *,) 13^{h} 29^{m} 55^{s}.				
May	14	−25	51	34.6
B. A. C. 4541 (2d *), 13^{h} 29^{m} 56^{s}.				
May	14	−25	51	24.6
Lacaille 5635, 13^{h} 33^{m} 9^{s}.				
May	22	−26	56	33.1
Weisse 566, 13^{h} 34^{m} 3^{s}.				
May	25	− 8	0	27.0
B. A. C. 4560, 13^{h} 34^{m} 22^{s}.				
May	17	−12	8	53.7
Weisse 569, 13^{h} 34^{m} 25^{s}.				
May	25	− 8	2	2.1
83 Virginis, 13^{h} 37^{m} 46^{s}.				
June	16	−15	32	58.5
86 Virginis, 13^{h} 39^{m} 18^{s}.				
May	31	−11	47	53.8
June	21			58.6
Weisse (2) 814, 13^{h} 39^{m} 30^{s}.				
June	10	+22	24	51.9
B. A. C. 4586, 13^{h} 39^{m} 42^{s}.				
May	11	−35	37	31.5

1875.		°	′	″
B. A. C. 4593, 13^{h} 40^{m} 55^{s}.				
May	19	− 6	4	46.1
Weisse (2) 866, 13^{h} 42^{m} 9^{s}.				
May	14	+38	31	3.8
g Centauri, 13^{h} 42^{m} 14^{s}.				
May	21	−33	49	32.4
June	18			32.3
Weisse (2) 899, 13^{h} 43^{m} 27^{s}.				
June	4	+18	30	6.5
(*), 13^{h} 43^{m} 30^{s}.				
May	17	−37	30	48.4
Lalande 25494, 13^{h} 44^{m} 30^{s}.				
May	25	+21	52	37.9
Piazzi 220, 13^{h} 44^{m} 32^{s}.				
May	25	+21	53	52.1
Weisse (2) 976, 13^{h} 46^{m} 5^{s}.				
June	16	+38	20	15.1
B. A. C. 4631, 13^{h} 46^{m} 16^{s}.				
June	1	−35	2	45.8
(* 8.5), 13^{h} 46^{m} 26^{s}.				
May	31	−28	23	48.1
Lacaille 5758, 13^{h} 49^{m} 20^{s}.				
May	11	−37	42	19.8
	14			20.1
Lacaille 5763, 13^{h} 49^{m} 27^{s}.				
May	19	−27	1	29.3
47 Hydræ, 13^{h} 51^{m} 32^{s}.				
June	21	−24	21	40.8
(* 8.5), 13^{h} 52^{m} 2^{s}.				
June	10	−36	42	54.5
Weisse (2) 1159, 13^{h} 53^{m} 35^{s}.				
May	17	+23	28	42.2
Brisbane 4727, 13^{h} 53^{m} 46^{s}.				
May	25	−36	51	38.2
June	16			44.7
(* 8.0), 13^{h} 53^{m} 56^{s}.				
May	31	−36	43	28.4

B. A. C. 4671, $13^h\ 55^m\ 17^s$.

1875.		° ′ ″
May	22	−26 49 29.9

(* 8.0), $13^h\ 56^m\ 36^s$.

June	4	−37 10 11.5

(*), $13^h\ 57^m\ 28^s$.

May	11	−37 40 45.7

π HYDRÆ, $13^h\ 59^m\ 17^s$.

May	14	−26 4 45.4
	17	43.4
June	21	45.9

WEISSE (2) 1314, $14^h\ 0^m\ 34^s$.

May	19	+34 58 59.1
June	18	57.4

LACAILLE 5837, $14^h\ 2^m\ 59^s$.

June	16	−30 1 40.2

LACAILLE 5842, $14^h\ 4^m\ 6^s$.

May	31	−29 11 33.1
June	4	35.7
	10	36.2

50 HYDRÆ, $14^h\ 5^m\ 38^s$.

June	18	−26 40 18.1
	21	19.8

B. A. C. 4719, $14^h\ 7^m\ 49^s$.

May	11	−28 41 49.3
	14	48.3
	22	48.1

LACAILLE 5873, $14^h\ 8^m\ 59^s$.

June	16	−31 28 29.8

ι VIRGINIS, $14^h\ 9^m\ 29^s$.

May	17	− 5 24 9.1
	19	10.0
June	10	10.8

λ VIRGINIS, $14^h\ 12^m\ 22^s$.

May	19	−12 47 41.4
	31	39.1

LACAILLE 5898, $14^h\ 13^m\ 11^s$.

June	4	−34 6 8.6
	21	8.4

B. A. C. 4773, $14^h\ 17^m\ 59^s$.

May	22	+ 6 23 18.6

WEISSE 314, $14^h\ 18^m\ 24^s$.

May	17	+ 3 6(20.8)
June	10	15.9
	16	13.3

B. A. C. 4776, $14^h\ 18^m\ 37^s$.

1875.		° ′ ″
May	19	−26 17 0.9

106 VIRGINIS, $14^h\ 22^m\ 8^s$.

June	18	− 6 20 17.2
	21	17.7

O. ARG. S. 13683, $14^h\ 23^m\ 43^s$.

May	31	−24 1 55.0
June	4	54.4

(*8.3), $14^h\ 29^m\ 11^s$.

May	17	+37 41 16.1
June	10	15.7

σ BOOTIS, $14^h\ 29^m\ 15^s$.

May	22	+30 17 20.2

(*9.0), $14^h\ 29^m\ 45^s$.

June	18	−27 41 17.1
	21	20.7

LACAILLE 6038, $14^h\ 33^m\ 21^s$.

May	19	−35 35 48.0

ζ BOOTIS, $14^h\ 35^m\ 12^s$.

May	31	+14 15 58.5
June	4	56.5
	10	57.1

B. A. C. 4852, $14^h\ 36^m\ 2^s$.

May	22	−34 38 3.1
	29	1.0

B. A. C. 4858, $14^h\ 37^m\ 20^s$.

May	25	−34 39 37.9
June	21	39.4

34 BOOTIS, $14^h\ 37^m\ 58^s$.

June	16	+27 3 35.0

57 HYDRÆ, $14^h\ 40^m\ 40^s$.

May	19	−26 7 15.2

LACAILLE 6109, $14^h\ 42^m\ 16^s$.

May	31	−31 54 11.1

WEISSE (2) 932, $14^h\ 43^m\ 45^s$.

June	4	+36 34 14.8
	10	14.1

WEISSE (2) 936, $14^h\ 44^m\ 12^s$.

June	4	+36 35 28.1
	10	27.4

B. A. C. 4901, $14^h\ 45^m\ 2^s$.

June	21	−37 17 14.6

B. A. C. 4937, $14^h\ 52^m\ 16^s$.

1875.		° ′ ″
May	19	+50 8 26.3
	31	27.7
June	4	26.8

LACAILLE 6186, $14^h\ 53^m\ 20^s$.

June	16	−37 33 35.2

δ LIBRÆ, $14^h\ 54^m\ 18^s$.

May	22	− 8 1 17.4
	29	17.9

B. A. C. 4941, $14^h\ 54^m\ 46^s$.

June	18	− 2 5 25.9
	21	28.4

(*9.2), $14^h\ 57^m\ 55^s$.

June	10	+10 24 22.3

LACAILLE 6219, $14^h\ 58^m\ 1^s$.

May	19	−30 3 55.7

O. ARG. S. 14257, $14^h\ 59^m\ 45^s$.

May	29	−29 1 8.8
June	4	6.1

LACAILLE 6239, $15^h\ 1^m\ 5^s$.

June	16	−38 3 11.0

B. A. C. 4984, $15^h\ 2^m\ 34^s$.

May	22	−23 30 24.0
	31	21.4

23 LIBRÆ, $15^h\ 6^m\ 12^s$.

June	18	−24 50 9.1
	21	10.0

ι LIBRÆ, $15^h\ 6^m\ 14^s$.

May	19	−19 10 30.5

26 LIBRÆ, $15^h\ 7^m\ 32^s$.

June	10	−17 18 0.5

2 LUPI, $15^h\ 10^m\ 15^s$.

May	22	−29 41 15.1
June	21	14.5

O. ARG. S. 14428, $15^h\ 10^m\ 41^s$.

May	31	−20 15 35.9

WEISSE (2) 237, $15^h\ 11^m\ 37^s$.

July	8	+37 31 47.8

(* 8.5), $15^h\ 13^m\ 12^s$.

June	4	−37 9 1.9
	16	2.7

B. A. C. 5062, $15^h\ 15^m\ 32^s$.

1875.		° ′ ″
June	18	−26 14 22.4

(* 8.3), $15^h\ 16^m\ 54^s$.

June	10	−37 3 16.5

11 URSÆ MAJORIS, S. P., $15^h\ 17^m\ 12^s$.

January	22	+72 16 38.1
	25	36.3

(* 7.0), $15^h\ 18^m\ 20^s$.

June	21	−36 9 21.5

RUMKER 5072, $15^h\ 19^m\ 49^s$.

June	16	+38 38 1.9

τ′ SERPENTIS, $15^h\ 20^m\ 1^s$.

May	21	+15 52 10.0

ι DRACONIS, $15^h\ 22^m\ 12^s$.

June	4	+59 24 14.5

(* 8.0), $15^h\ 25^m\ 43^s$.

July	8	−37 12 55.4

B. A. C. 5133, $15^h\ 28^m\ 37^s$.

July	14	−28 34 50.3

LALANDE 28391, $15^h\ 28^m\ 36^s$.

June	10	+27 7 49.9
	16	49.4

39 LIBRÆ, $15^h\ 29^m\ 27^s$.

June	18	−27 43 8.7
	21	9.4

B. A. C. 5167, $15^h\ 33^m\ 55^s$.

June	4	−28 53 40.0
July	8	40.9

LACAILLE 6499, $15^h\ 36^m\ 19^s$.

July	14	−31 12 5.4

B. A. C. 5195, $15^h\ 38^m\ 6^s$.

June	8	−29 38 46.8
	21	47.3

B. A. C. 5198, $15^h\ 38^m\ 38^s$.

June	16	−27 40 5.4

B. A. C. 5215 $15^h\ 40^m\ 44^s$.

June	4	−28 24 1.8
	10	2.3

A Scorpii (2d *), 15^h 46^m 8^s.

1875.		°	′	″
July	14	−24	57	7.7

B. A. C. 5253, 15^h 46^m 27^s.

July	8	−24	9	32.2

ξ Lupi (1st *), 15^h 48^m 51^s.

June	4	−33	35	53.8

ξ Lupi (2d *), 15^h 48^m 52^s.

June	4	−33	35	46.8

ρ Scorpii, 15^h 49^m 12^s.

June	21	−28	50	49.9
July	7			50.0

γ Serpentis, 15^h 50^m 42^s.

June	10	+16	4	15.5
	16			14.2
	18			15.8

Lacaille 6641. 15^h 53^m 55^s.

July	14	−36	23	23.1

B. A. C. 5314, 15^h 55^m 48^s.

June	18	−25	30	53.4
	21			54.3

O. Arg. N. 15839, 15^h 57^m 27^s.

July	8	+69	59	30.0
	13			30.9

Weisse (2) 1081, 15^h 58^m 3^s.

June	16	+ 6	23	57.0

O. Arg. S. 15240, 16^h 0^m 6^s.

June	10	−20	31	44.6

B. A. C. 5365, 16^h 2^m 40^s.

July	7	−24	15	1.0

B. A. C. 5374, 16^h 3^m 18^s.

June	18	−29	5	2.5
	21			3.7
July	14			3.9

ν^1 Scorpii, 16^h 4^m 46^s.

July	16	−19	7	22.5

ν^2 Scorpii, 16^h 4^m 46^s.

July	16	−19	8	0.1

Lalande 29654, 16^h 8^m 48^s.

June	16	+38	23	23.4

B. A. C. 5429, 16^h 10^m 34^s.

1875.		°	′	″
June	18	−28	18	3.8
	21			4.5
July	14			4.4

B. A. C. 5430, 16^h 10^m 34^s.

July	17	−27	43	53.7

O. Arg. S. 15566, 16^h 15^m 26^s.

July	16	−22	49	15.4

O. Arg. S. 15571, 16^h 15^m 45^s.

July	13	−16	43	21.9

Lacaille 6815 (1st *), 16^h 15^m 56^s.

July	7	−32	54	15.2

Lacaille 6815 (2d *), 16^h 15^m 56^s.

July	7	−32	54	18.6

(* 7.8), 16^h 18^m 6^s.

June	16	−23	6	56.7

χ Ophiuchi, 16^h 19^m 49^s.

June	18	−18	10	14.9
	21			14.9
July	14			14.7

B. A. C. 5508, 16^h 23^m 15^s.

July	13	−34	25	47.9
	16			47.4
	17			48.3

Lacaille 6888, 16^h 27^m 55^s.

July	8	−40	2	32.5

B. A. C. 5538, 16^h 28^m 11^s.

June	18	−34	59	44.4
	21			45.4
July	14			44.1

Lacaille 6922, 16^h 32^m 6^s.

June	16	−33	29	41.6
	23			40.1
July	7			39.3
	13			40.2

B. A. C. 5567, 16^h 33^m 17^s.

July	16	−20	9	43.8

O. Arg. S. 15847, 16^h 34^m 33^s.

July	17	−24	34	34.9

(* 9.0), 16^h 35^m 15^s.

July	7	−30	9	19.6
	14			22.7

B. A. C. 5600, 16^h 36^m 33^s.

1875.		°	′	″
July	8	−27	13	8.5

39 Herculis, 16^h 36^m 34^s.

June	18	+27	9	33.9
	21			33.4

O. Arg. S. 15896, 16^h 37^m 10^s.

July	8	−27	13	13.1
	13			11.2

B. A. C. 5625, 16^h 40^m 39^s.

July	16	+ 2	28	9.5

Lacaille 6999, 16^h 42^m 35^s.

June	16	−37	17	45.0

(* 7.0), 16^h 46^m 38^s.

July	8	−38	12	21.5
	13			21.2
	14			22.1

Lalande 30745. 16^h 47^m 6^s.

June	23	+38	9	47.4
July	7			47.1

23 Ophiuchi, 16^h 47^m 56^s.

June	18	− 5	56	50.1
	21			51.4

(* 8.0), 16^h 48^m 31^s.

July	8	−38	13	53.2
	13			55.2
	14			52.3

(* 8.0), 16^h 48^m 46^s.

July	16	−36	58	57.8

26 Ophiuchi, 16^h 52^m 32^s.

June	21	−24	47	46.3
July	12			44.8

B. A. C. 5718, 16^h 53^m 49^s.

July	17	−31	57	19.2

Weisse 1033, 16^h 55^m 42^s.

July	7	− 9	6	2.0

31 Ophiuchi, 16^h 57^m 5^s.

July	14	−25	27	53.0

Lalande 31055, 16^h 58^m 34^s.

June	23	− 4	51	8.9
July	2			7.9

B. A. C. 5759, 16^h 59^m 5^s.

1875.		°	′	″
July	8	−26	20	28.7

B. A. C. 5768, 17^h 0^m 50^s.

July	17	−30	14	7.3

Lalande 31199, 17^h 3^m 40^s.

July	7	−20	29	29.4

B. A. C. 5789, 17^h 4^m 27^s.

July	14	−26	53	0.5

B. A. C. 5792, 17^h 4^m 37^s.

June	23	−27	36	20.3

(*9.0), 17^h 5^m 31^s.

July	12	−35	9	3.8

B. A. C. 5818, 17^h 8^m 55^s.

July	2	−30	12	30.5

B. A. C. 5820, 17^h 9^m 23^s.

July	17	−30	1	24.0

B. A. C. 5833, 17^h 11^m 14^s.

July	8	−31	13	31.8

O. Arg. S. 16623, 17^h 12^m 48^s.

July	14	−26	25	6.8

B. A. C. 5846, 17^h 14^m 2^s.

June	23	−24	46	40.5
July	2			38.2
	7			39.9
	12			37.2

(*9.2), 17^h 17^m 5^s.

July	8	+35	19	35.0

d Ophiuchi, 17^h 19^m 24^s.

July	17	−29	45	6.5

(*8.0), 17^h 21^m 16^s.

June	23	+37	53	50.5
July	2			49.9

Lacaille 7312, 17^h 21^m 52^s.

July	7	−33	36	47.9

Lacaille 7324, 17^h 22^m 34^s.

July	7	−33	36	15.4

LACAILLE 7330, $17^{h}\ 24^{m}\ 10^{s}$.

1875.		°	′	″
July	12 . .	−34	10	55.0

O. ARG. S. 16952, $17^{h}\ 27^{m}\ 40^{s}$

July	8 . .	−18	9	58.4
	16 . .			54.6

52 OPHIUCHI, $17^{h}\ 27^{m}\ 49^{s}$.

July	17 . .	−21	57	26.2

(*8.5), $17^{h}\ 31^{m}\ 21^{s}$.

June	23 . .	−32	7	55.1

(*7.5), $17^{h}\ 31^{m}\ 54^{s}$.

July	2 . .	−32	8	9.2

B. A. C. 5964, $17^{h}\ 32^{m}\ 52^{s}$.

June	23 . .	−32	8	39.1
July	2 . .			37.2

(*), $17^{h}\ 34^{m}\ 47^{s}$.

July	8 . .	−23	45	59.3

O. ARG. S. 17094, $17^{h}\ 34^{m}\ 51^{s}$.

July	16 . .	−23	40	13.7

ι HERCULIS, $17^{h}\ 35^{m}\ 57^{s}$.

July	17 . .	+46	4	25.5

O. ARG. S. 17133, $17^{h}\ 36^{m}\ 51^{s}$.

July	17 . .	−21	40	21.2

LACAILLE 7430, $17^{h}\ 39^{m}\ 33^{s}$.

July	14 . .	−34	15	38.7

(*8.5), $17^{h}\ 44^{m}\ 10^{s}$.

August	21 . .	−34	48	48.6

(*8.0), $17^{h}\ 44^{m}\ 52^{s}$.

July	7 . .	−34	35	15.5

(*8.0), $17^{h}\ 45^{m}\ 18^{s}$.

July	16 . .	−34	49	58.4

(*8.5), $17^{h}\ 45^{m}\ 28^{s}$.

July	2 . .	−34	48	50.7
August	21 . .			53.9

(*7.7), $17^{h}\ 45^{m}\ 44^{s}$.

July	2 . .	−34	47	59.1

B. A. C. 6044, $17^{h}\ 45^{m}\ 45^{s}$.

1875.		°	′	″
June	23 . .	−27	15	6.5

30 DRACONIS, $17^{h}\ 46^{m}\ 2^{s}$.

September	4 . .	+50	48	40.6

(*8.0), $17^{h}\ 46^{m}\ 16^{s}$.

July	16 . .	−34	50	53.8
August	21 . .			55.0

(*8.0), $17^{h}\ 46^{m}\ 32^{s}$.

July	7 . .	−34	30	48.6
	14 . .			48.7

(*7.5), $17^{h}\ 46^{m}\ 42^{s}$.

July	8 . .	+37	44	28.7
	17 . .			30.3

B. A. C. 6076, $17^{h}\ 51^{m}\ 43^{s}$.

September	2 . .	−33	23	45.4

(*6.0), $17^{h}\ 54^{m}\ 26^{s}$.

June	23 . .	+36	17	59.1
July	7 . .			60.0

O. ARG. S. 17503, $17^{h}\ 54^{m}\ 40^{s}$.

July	8 . .	−15	38	34.7

O. ARG. S. 17510, $17^{h}\ 55^{m}\ 3^{s}$.

July	14 . .	−24	15	4.8
	16 . .			2.8

O. ARG. S. 17512, $17^{h}\ 55^{m}\ 6^{s}$.

July	14 . .	−24	14	31.8
	16 . .			31.5

B. A. C. 6098, $17^{h}\ 55^{m}\ 12^{s}$.

September	8 . .	−20	44	2.8
	9 . .			3.8

7 SAGITTARII, $17^{h}\ 55^{m}\ 14^{s}$.

August	25 . .	−24	16	43.5
September	4 . .			45.6

B. A. C. 6103, $17^{h}\ 56^{m}\ 28^{s}$.

September	6 . .	−35	54	8.8
	7 . .			7.1

(* 8.5), $17^{h}\ 57^{m}\ 35^{s}$.

July	2 . .	−37	26	17.1
August	21 . .			19.9

B. A. C. 6127, $18^{h}\ 0^{m}\ 10^{s}$.

September	16 . .	−28	28	9.7

B. A. C. 6131, $18^{h}\ 0^{m}\ 58^{s}$.

August	30 . .	−31	10	28.1
September	2 . .			28.8

(* 8.0), $18^{h}\ 5^{m}\ 8^{s}$.

1875.		°	′	″
June	23 . .	+36	29	46.4
July	7 . .			46.6
	8 . .			46.2
	14 . .			47.5

12 SAGITTARII, $18^{h}\ 5^{m}\ 28^{s}$.

September	8 . .	−23	8	43.3
	9 . .			43.9

(* 6.0), $18^{h}\ 5^{m}\ 32^{s}$.

July	2 . .	+38	27	2.2
August	21 . .			2.6

LALANDE 33472, $18^{h}\ 5^{m}\ 42^{s}$.

July	16 . .	+36	26	34.0
August	25 . .			31.0

LACAILLE 7629, $18^{h}\ 7^{m}\ 12^{s}$.

September	4 . .	−34	37	(45.3)
	6 . .			40.0
	7 . .			41.0

LALANDE 33602, $18^{h}\ 8^{m}\ 52^{s}$.

August	30 . .	+35	9	47.6

B. A. C. 6187, $18^{h}\ 9^{m}\ 7^{s}$.

September	2 . .	−27	45	6.5

LACAILLE 7657, $18^{h}\ 10^{m}\ 13^{s}$.

September	9 . .	−34	43	46.9

B. A. C. 6199, $18^{h}\ 11^{m}\ 0^{s}$.

September	7 . .	−25	38	55.3
	8 . .			55.1

LACAILLE 7662, $18^{h}\ 12^{m}\ 24^{s}$.

June	23 . .	−37	32	18.7

B. A. C. 6210, $18^{h}\ 13^{m}\ 1^{s}$.

August	25 . .	−15	52	49.7
September	4 . .			50.6
	6 . .			49.6

B. A. C. 6217, $18^{h}\ 13^{m}\ 50^{s}$.

July	2 . .	−24	58	8.0
September	16 . .			10.1

B. A. C. 6220, $18^{h}\ 14^{m}\ 7^{s}$.

July	16 . .	−28	29	2.1

B. A. C. 6226, $18^{h}\ 15^{m}\ 4^{s}$.

July	8 . .	−36	17	47.1
	14 . .			47.9

(* 8.5), $18^{h}\ 16^{m}\ 34^{s}$.

August	21 . .	−29	35	13.3

B. A. C. 6244, $18^{h}\ 17^{m}\ 50^{s}$.

1875.		°	′	″
September	2 . .	−31	49	15.7
	9 . .			15.8
	14 . .			17.2

21 SAGITTARII, $18^{h}\ 17^{m}\ 56^{s}$.

July	7 . .	−20	36	23.9
August	30 . .			23.7

LACAILLE 7708, $18^{h}\ 19^{m}\ 0^{s}$.

September	7 . .	−36	5	10.2
	8 . .			10.6

B. A. C. 6270, $18^{h}\ 21^{m}\ 13^{s}$.

September	4 . .	−26	39	29.4
	6 . .			28.0

(* 8.0), $18^{h}\ 21^{m}\ 13^{s}$.

September	4 . .	−26	40	11.5
	6 . .			14.1

(* 8.0), $18^{h}\ 22^{m}\ 37^{s}$.

July	16 . .	+35	59	59.2

B. A. C. 6283, $18^{h}\ 22^{m}\ 38^{s}$.

August	25 . .	−28	52	29.7

(* 8.0), $18^{h}\ 22^{m}\ 48^{s}$.

July	16 . .	+35	57	17.5

23 SAGITTARII, $18^{h}\ 22^{m}\ 56^{s}$.

September	16 . .	−23	20	53.4

LACAILLE 7757, $18^{h}\ 24^{m}\ 14^{s}$.

July	14 . .	−35	26	6.5

LALANDE 34274, $18^{h}\ 24^{m}\ 34^{s}$.

July	2 . .	+35	42	57.6

LACAILLE 7765, $18^{h}\ 26^{m}\ 36^{s}$.

September	9 . .	−39	47	15.7

25 SAGITTARII, $18^{h}\ 26^{m}\ 56^{s}$.

June	23 . .	−24	18	55.3
July	9 . .			56.4
August	21 . .			54.8

B. A. C. 6317, $18^{h}\ 27^{m}\ 16^{s}$.

September	7 . .	−32	59	9.0
	8 . .			10.3

B. A. C. 6321, $18^{h}\ 28^{m}\ 4^{s}$.

August	30 . .	−29	47	45.4
September	2 . .			45.0

LALANDE 34412, $18^{h}\ 28^{m}\ 37^{s}$.

July	7 . .	+37	20	16.1

B. A. C. 6334, $18^h\ 30^m\ 12^s$.

1875.		°	′	″
September	4	−32	47	6.6
	6			6.2
	14			6.9

LACAILLE 7815, $18^h\ 32^m\ 23^s$.

July	2	−33	58	5.2
	16			1.8
August	25			4.8

LACAILLE 7823, $18^h\ 34^m\ 16^s$.

September	8	−39	24	8.7
	9			9.0

λ CORONÆ AUSTRALIS, $18^h\ 35^m\ 16^s$.

August	30	−38	26	28.4
September	2			28.3
	7			26.6

2 AQUILÆ, $18^h\ 35^m\ 27^s$.

September	16	− 9	10	12.8
	20			12.1

B. A. C. 6377, $18^h\ 38^m\ 52^s$.

September	4	−29	45	33.8
	6			35.4
	21			35.5
	24			35.6

LACAILLE 7846, $18^h\ 39^m\ 3^s$.

June	23	−40	32	13.0
July	2			14.6
	16			10.5
August	21			13.9

LACAILLE 7858, $18^h\ 39^m\ 57^s$.

August	25	−37	8	45.5
September	2			45.6

5 AQUILÆ (1st *), $18^h\ 40^m\ 3^s$.

September	14	− 1	5	28.8

5 AQUILÆ (2d *), $11^h\ 40^m\ 3^s$.

September	14	− 1	5	37.9

B. A. C. 6401, $18^h\ 42^m\ 53^s$.

September	7	−26	54	37.7
	8			38.8

WEISSE 1056, $18^h\ 43^m\ 1^s$.

July	7	− 6	3	8.6

WEISSE 1058, $18^h\ 43^m\ 2^s$.

July	7	− 6	5	1.2

B. A. C. 6413, $18^h\ 44^m\ 43^s$.

September	9	−29	31	30.3
	20			29.9
	29			31.3

B. A. C. 6414, $18^h\ 44^m\ 44^s$.

1875.		°	′	″
August	30	−30	52	49.7

33 SAGITTARII, $18^h\ 46^m\ 34^s$.

September	2	−21	30	39.2
	21			39.2

B. A. C. 6435, $18^h\ 46^m\ 56^s$.

June	23	−37	32	23.3
September	4			28.7
	6			26.1

(* 8.0), $18^h\ 47^m\ 50^s$.

July	2	−33	24	49.9
	16			49.6

(* 8.3), $18^h\ 48^m\ 10^s$.

July	2	−33	25	29.5

B. A. C. 6444, $18^h\ 48^m\ 14^s$.

September	14	−37	30	1.2
	16			3.8

B. A. C. 6447, $18^h\ 48^m\ 21^s$.

September	24	−16	31	35.7
	27			36.8

O. ARG. S. 18847, $18^h\ 48^m\ 34^s$.

September	24	−16	30	16.9
	27			18.6

B. A. C. 7926, $18^h\ 48^m\ 48^s$.

August	21	−33	29	17.3

B. A. C. 6455, $18^h\ 50^m\ 7^s$.

September	7	−30	59	11.9
	8			14.0

B. A. C. 6474, $18^h\ 52^m\ 12^s$.

August	25	−28	13	8.3
	30			8.3
September	8			10.1

B. A. C. 7955, $18^h\ 53^m\ 16^s$.

September	21	−37	3	45.5

γ LYRÆ, $18^h\ 54^m\ 19^s$.

September	4	+32	31	9.2
	6			9.5

B. A. C. 6490, $18^h\ 54^m\ 52^s$.

July	16	−25	0	57.3

12 AQUILÆ, $18^h\ 55^m\ 2^s$.

September	2	− 5	54	46.7

LALANDE 35499, $18^h\ 55^m\ 49^s$.

1875.		°	′	″
August	21	−19	16	52.8

g AQUILÆ, $18^h\ 56^m\ 21^s$.

September	20	− 3	52	41.6

B. A. C. 6505, $18^h\ 57^m\ 10^s$.

September	14	−25	24	47.2
	16			47.9

(* 9.2), $18^h\ 57^m\ 22^s$.

June	23	− 8	46	15.9

LACAILLE 7990, $18^h\ 58^m\ 28^s$.

September	7	−37	59	8.4
	8			9.5

B. A. C. 6515, $18^h\ 58^m\ 43^s$.

September	24	−27	28	26.1

B. A. C. 6525, $18^h\ 59^m\ 40^s$.

September	27	−28	49	40.0

B. A. C. 6531, $19^h\ 0^m\ 15^s$.

September	9	−25	53	38.7
	29			38.9

a CORONÆ AUSTRALIS, $19^h\ 0^m\ 56^s$.

August	25	−38	5	48.2
September	21			46.7

LACAILLE 8008, $19^h\ 1^m\ 17^s$.

August	30	−36	21	38.8

B. A. C. 6546, $19^h\ 2^m\ 0^s$.

September	2	−27	18	38.9
	4			37.5
	6			38.4

LALANDE 36002, $19^h\ 4^m\ 25^s$.

July	16	+38	18	37.5

B. A. C. 6562, $19^h\ 5^m\ 34^s$.

September	7	−26	6	50.3
	8			50.6

(* 7.5), $19^h\ 6^m\ 25^s$.

September	24	−29	29	3.5

B. A. C. 6569, $19^h\ 6^m\ 48^s$.

August	21	−29	27	13.4
September	9			12.8
	14			12.5
	20			12.7
	24			10.8

LACAILLE 8041, $19^h\ 7^m\ 16^s$.

1875.		°	′	″
September	29	−37	9	43.8

B. A. C. 6576, $19^h\ 7^m\ 58^s$.

August	30	−24	23	25.2

(* 7.0), $19^h\ 8^m\ 40^s$.

September	21	−32	6	6.3

LACAILLE 8060, $19^h\ 10^m\ 16^s$.

September	27	−33	22	26.2

d SAGITTARII, $19^h\ 10^m\ 22^s$.

August	25	−19	10	23.0

LACAILLE 8066, $19^h\ 10^m\ 54^s$.

September	4	−33	29	52.1
	6			51.1
	20			51.8

(* 6.8), $19^h\ 10^m\ 59^s$.

September	27	−33	22	58.3

LACAILLE 8077, $19^h\ 13^m\ 17^s$.

September	7	−35	12	39.4
	8			40.3
	29			40.0

v SAGITTARII, $19^h\ 14^m\ 36^s$.

August	30	−16	11	15.6
September	2			15.9

ρ^2 SAGITTARII, $19^h\ 14^m\ 36^s$.

September	9	−18	32	16.3
	14			16.6

LACAILLE 8090, $19^h\ 15^m\ 38^s$.

September	21	−35	12	15.5

χ^1 SAGITTARII, $19^h\ 17^m\ 42^s$.

September	24	−24	44	56.1

LALANDE 36557, $19^h\ 17^m\ 50^s$.

August	25	−15	15	56.8

B. A. C. 6639, $19^h\ 19^m\ 5^s$.

September	4	−29	59	18.1
	6			17.4

B. A. C. 6643, $19^h\ 19^m\ 6^s$.

August	25	−15	17	54.9
September	2			56.1

B. A. C. 6663, $19^h\ 21^m\ 2^s$.

September	20	+19	38	40.6
	27			39.6

(* 6.7), 19^h 21^m 29^s.

1875. ° ′ ″
September 29 . . −15 21 16.3

Lacaille 8120, 19^h 22^m 14^s.

August 30 . . −32 20 45.9

Lacaille 8128, 19^h 23^m 34^s.

September 7 . . −36 13 8.2
8 . . 7.9
21 . . 7.8

B. A. C. 6684, 19^h 25^m 13^s.

September 9 . . −30 37 35.3
14 . . 33.2
24 . . 33.3

B. A. C. 6694, 19^h 27^m 5^s.

September 4 . . −24 7 37.7
6 . . 36.9

Lacaille 8159, 19^h 28^m 36^s.

September 20 . . −32 57 51.5
27 . . 54.0

Lacaille 8169, 19^h 29^m 59^s.

August 30 . . −33 11 23.0
September 2 . . 21.1

O. Arg. S. 19845, 19^h 33^m 6^s.

September 24 . . −27 58 50.1

Lacaille 8185, 19^h 33^m 34^s.

September 7 . . −37 10 30.4
8 . . 32.4

Lacaille 8186, 19^h 33^m 58^s.

September 9 . . −36 55 12.9
14 . . 13.0
21 . . 12.2

45 Aquilæ, 19^h 34^m 19^s.

September 29 . . − 0 54 32.6

Lacaille 8196, 19^h 35^m 20^s.

September 4 . . −37 49 53.2
6 . . 51.2

e^2 Sagittarii, 19^h 35^m 25^s.

September 20 . . −16 24 54.1

Lacaille 8197, 19^h 35^m 51^s.

September 27 . . −41 54 15.6

O. Arg. S. 19933, 19^h 38^m 37^s.

August 30 . . −27 34 5.3
September 2 . . 6.1

Lacaille 8231, 19^h 41^m 17^s.

1875. ° ′ ″
September 7 . . −38 5 8.3

O. Arg. S. 19978, 19^h 41^m 26.

August 21 . . −29 5 38.4
September 21 . . 39.4
24 . . 39.4

B. A. C. 6786, 19^h 42^m 45^s.

September 20 . . −27 1 40.8

Weisse 1068, 19^h 43^m 27^s.

September 29 . . −14 14 12.8

B. A. C. 6795, 19^h 44^m 2^s.

September 9 . . −27 23 51.0
14 . . 51.5
27 . . 52.2

B. A. C. 6814, 19^h 46^m 52^s.

August 25 . . −24 14 59.2
September 8 . . 59.8

b Sagittarii, 19^h 49^m 19^s.

August 30 . . −27 29 58.2
September 2 . . 56.9
7 . . 57.0
21 . . 55.5

Lacaille 8278, 19^h 50^m 0^s.

September 24 . . −37 1 2.8
29 . . 4.6

Lacaille 8293, 19^h 52^m 1^s.

September 9 . . −38 2 21.9
14 . . 23.5

Lacaille 8302, 19^h 52^m 45^s.

September 20 . −32 30 51.9

Lacaille 8300, 19^h 53^m 54^s.

September 27 . −38 55 31.3

B. A. C. 6864, 19^h 53^m 59^s.

September 8 . . −23 4 43.8

O. Arg. S. 20156, 19^h 54^m 27^s.

August 21 . . −28 20 24.8
25 . . 23.8

Lacaille 8309, 19^h 55^m 16^s.

September 2 . . −39 11 49.7

B. A. C. 6877, 19^h 56^m 26^s.

September 24 . . −32 24 17.9

(* 6.5), 19^h 56^m 41^s.

1875. ° ′ ″
August 30 . . +36 45 6.3

O. Arg. S. 20200, 19^h 57^m 6^s.

September 21 . . −22 32 16.9

62 Aquilæ, 19^h 58^m 0^s.

September 6 . . − 1 3 21.5
29 . . 23.2

64 Sagittarii, 19^h 58^m 15^s.

September 7 . . −11 57 2.8
8 . . 4.3

Lacaille 8341, 19^h 59^m 30^s.

September 9 . . −36 0 44.5
14 . . 43.4

B. A. C. 6907, 20^h 1^m 28^s.

August 31 . . −15 23 16.6
September 27 . . 19.1

18 Vulpeculæ, 20^h 5^m 22^s.

August 30 . . +26 32 5.7
September 2 . . 6.2

B. A. C. 6947, 20^h 7^m 33^s.

September 4 . . −27 24 16.6
6 . . 16.3

B. A. C. 6948, 20^h 8^m 8^s.

September 7 . . −30 23 4.8
8 . . 5.7
9 . . 6.0
14 . . 5.2

Lacaille 8385, 20^h 8^m 18^s.

September 24 . . −36 49 59.9
29 . . 60.1

Lacaille 8399, 20^h 11^m 20^s.

September 27 . . −33 7 11.1

Lacaille 8406, 20^h 12^m 48^s.

August 30 . . −36 3 58.2
31 . . 57.1

(* 7.3), 20^h 13^m 23^s.

September 27 . . −33 7 49.1

B. A. C. 6992, 20^h 13^m 48^s.

August 25 . . −15 10 37.0
September 2 . . 38.8

β Capricorni, 20^h 14^m 2^s.

August 25 . . −15 10 27.8

Lacaille 8418, 20^h 15^m 1^s.

1875. ° ′ ″
September 24 . . −35 46 25.4
29 . . 26.4

Lacaille 8421, 20^h 15^m 46^s.

September 7 . . −35 31 40.5
8 . . 41.5

25 Vulpeculæ, 20^h 16^m 44^s.

September 4 . . +24 2 55.4
6 . . 55.5

Lacaille 8432, 20^h 18^m 6^s.

September 9 . . −34 2 22.9
14 . . 21.6

B. A. C. 7021, 20^h 18^m 18^s.

August 31 . . −26 57 (42.5)
September 20 . . 37.5
23 . . 38.2

B. A. C. 7025, 20^h 18^m 50^s.

August 21 . . −37 48 19.6

ρ Capricorni, 20^h 21^m 46^s.

August 30 . . −18 13 30.9
September 24 . . 30.3

B. A. C. 7044, 20^h 21^m 54^s.

September 2 . . −18 17 3.5

41 Cygni, 20^h 24^m 20^s.

September 7 . . +29 57 9.1
8 . . 9.4
29 . . 9.3

B. A. C. 7069, 20^h 24^m 57^s.

September 6 . . −22 34 30.5

B. A. C. 7070, 20^h 24^m 59^s.

September 4 . . −22 34 55.1
6 . . 55.8

Lacaille 8476, 20^h 24^m 59^s.

September 27 . . −31 48 12.8

Lacaille 8492, 20^h 27^m 7^s.

September 9 . . −30 53 57.1
14 . . 55.1

B. A. C. 7087, 20^h 27^m 18^s.

August 21 . . −14 8 56.2
25 . . 56.6

Lacaille 8497, 20^h 29^m 27^s.

September 20 . . −41 39 28.9

Star	1875.		°	′	″
ζ DELPHINI, $20^h\ 29^m\ 33^s$.	September	24	+14	14	40.9
B. A. C. 7114, $20^h\ 30^m\ 8^s$.	August	30	+40	40	7.2
		31			6.2
	September	23			6.0
LACAILLE 8513, $20^h\ 32^m\ 14^s$.	September	2	−36	14	7.5
τ^2 CAPRICORNI, $20^h\ 32^m\ 20^s$.	September	4	−15	23	28.9
		6			29.4
48 CYGNI, $20^h\ 32^m\ 26^s$.	September	29	+31	8	13.8
B. A. C. 7133, $20^h\ 33^m\ 1^s$.	September	7	−24	32	50.5
		8			51.6
B. A. C. 7148, $20^h\ 34^m\ 3^s$.	September	9	−28	26	12.7
		14			12.3
B. A. C. 7155, $20^h\ 34^m\ 44^s$.	September	27	−40	0	14.9
B. A. C. 7172, $20^h\ 37^m\ 41^s$.	September	24	− 4	21	52.1
LACAILLE 8546, $20^h\ 37^m\ 46^s$.	September	23	−30	55	42.1
B. A. C. 7175, $20^h\ 38^m\ 14^s$.	September	4	−39	39	2.7
		6			4.7
17 CAPRICORNI, $20^h\ 38^m\ 58^s$.	September	20	−21	57	59.5
B. A. C. 7187, $20^h\ 39^m\ 54^s$.	August	30	−26	52	14.3
		31			15.5
	September	2			15.5
		29			14.5
B. A. C. 7197, $20^h\ 41^m\ 8^s$.	September	7	−23	11	33.9
		8			34.4
LACAILLE 8587, $20^h\ 43^m\ 7^s$.	September	27	−32	30	59.3
β MICROSCOPII, $20^h\ 44^m\ 15^s$.	September	24	−33	38	37.7
O. ARG. S. 20906, $20^h\ 44^m\ 37^s$.	September	23	−31	9	47.4
4 AQUARII, $20^h\ 44^m\ 50^s$.	September	9	− 6	5	32.3
		14			32.6
LACAILLE 8609, $20^h\ 45^m\ 48^s$.	September	4	−36	39	48.9
		6			48.9
LACAILLE 8610, $20^h\ 45^m\ 48^s$.	September	23	−31	11	16.7
B. A. C. 7248, $20^h\ 47^m\ 42^s$.	September	20	−19	15	57.7
		29			57.9
B. A. C. 7252, $20^h\ 49^m\ 24^s$.	September	2	−26	46	16.2
17 DELPHINI, $20^h\ 49^m\ 44^s$.	September	7	+13	14	44.8
		8			45.1
B. A. C. 7263, $20^h\ 50^m\ 42^s$.	August	31	−16	30	40.5
	September	27			40.8
LACAILLE 8630, $20^h\ 52^m\ 8^s$.	September	24	−36	36	39.8
20 CAPRICORNI, $20^h\ 52^m\ 33^s$.	September	9	−19	31	5.8
LACAILLE 8635, $20^h\ 53^m\ 9^s$.	September	24	−36	32	30.5
1 PISCIS AUSTRALIS, $20^h\ 53^m\ 40^s$.	September	4	−32	44	41.6
		6			40.1
η CAPRICORNI, $20^h\ 57^m\ 19^s$.	September	21	−20	20	51.0
LACAILLE 8677, $20^h\ 58^m\ 10^s$.	September	29	−36	45	20.4
δ MICROSCOPII, $20^h\ 58^m\ 30^s$.	September	2	−30	37	11.4
		7			11.2
A CAPRICORNI, $20^h\ 59^m\ 50^s$.	August	31	−25	30	15.4
	September	8			14.3
LACAILLE 8697, $21^h\ 1^m\ 26^s$.	September	27	−38	26	14.5
LACAILLE 8701, $21^h\ 1^m\ 33^s$.	September	20	−28	58	34.9
LACAILLE 8699, $21^h\ 1^m\ 35^s$.	September	4	−37	12	20.0
		6			18.2
B. A. C. 7340, $21^h\ 1^m\ 59^s$.	September	24	−24	7	51.2
f^2 CYGNI, $21^h\ 2^m\ 19^s$.	September	9	+47	8	47.7
		14			47.9
LACAILLE 8707, $21^h\ 2^m\ 37^s$.	September	23	−30	13	35.7
LACAILLE 8722, $21^h\ 5^m\ 1^s$.	September	29	−36	16	21.1
LACAILLE 8725, $21^h\ 5^m\ 34^s$.	September	7	−36	56	7.1
		8			8.8
LACAILLE 8736, $21^h\ 6^m\ 31^s$.	August	31	−30	10	34.1
φ CAPRICORNI, $21^h\ 8^m\ 33^s$.	September	24	−21	10	8.6
		27			9.8
LACAILLE 8758, $21^h\ 9^m\ 58^s$.	September	4	−31	15	58.8
		6			58.4
		20			60.6
O. ARG. S. 21286, $21^h\ 11^m\ 33^s$.	September	21	−29	17	14.8
θ^1 MICROSCOPII, $21^h\ 12^m\ 48^s$.	September	8	−41	20	13.5
		9			12.9
A CYGNI, $21^h\ 13^m\ 46^s$.	September	29	+43	25	14.4
LACAILLE 8790, $21^h\ 15^m\ 17^s$.	September	24	−29	57	58.3
1 PEGASI, $21^h\ 16^m\ 20^s$.	August	31	+19	16	14.4
B. A. C. 7419, $21^h\ 16^m\ 43^s$.	September	27	−25	44	9.1
B. A. C. 7422, $21^h\ 17^m\ 2^s$.	September	20	−26	5	43.0
LACAILLE 8821, $21^h\ 20^m\ 14^s$.	September	23	−28	16	1.4
5 PISCIS AUSTRALIS, $21^h\ 21^m\ 37^s$.	September	29	−31	46	52.8
b CAPRICORNI, $21^h\ 21^m\ 39^s$.	September	9	−22	21	0.5
B. A. C. 7463, $21^h\ 23^m\ 1^s$.	September	20	−19	41	30.2
LACAILLE 8834, $21^h\ 23^m\ 32^s$.	September	24	−26	15	25.3
2 PEGASI, $21^h\ 24^m\ 19^s$.	August	31	+23	5	29.4
B. A. C. 7479, $21^h\ 25^m\ 24^s$.	September	27	−25	8	27.5
8 PISCIS AUSTRALIS, $21^h\ 28^m\ 58^s$.	September	29	−26	43	39.7
7 PISCIS AUSTRALIS, $21^h\ 29^m\ 20^s$.	September	23	−33	36	19.9
B. A. C. 7515, $21^h\ 31^m\ 12^s$.	September	14	− 0	56	58.7
LACAILLE 8867, $21^h\ 31^m\ 38^s$.	September	20	−34	14	21.8
d AQUARII, $21^h\ 33^m\ 15^s$.	August	31	+ 1	40	58.2
	September	24			59.0
(* 6.5), $21^h\ 34^m\ 15^s$.	September	27	−33	5	44.6
LACAILLE 8889, $21^h\ 34^m\ 49^s$.	September	27	−33	4	28.9
LACAILLE 8907, $21^h\ 38^m\ 16^s$.	September	14	−28	41	59.6
LACAILLE 8906, $21^h\ 38^m\ 17^s$.	September	29	−29	17	50.5

Lacaille 8911, 21^{h} 39^{m} 0^{s}.

1875. ° ′ ″
September 23 . . −33 17 18.7

λ Capricorni, 21^{h} 39^{m} 50^{s}.

August 31 . . −11 56 28.7

θ Piscis Australis, 21^{h} 40^{m} 27^{s}.

September 20 . . −31 28 32.3
24 . . 31.3

Lacaille 8948, 21^{h} 45^{m} 44^{s}.

September 29 . . −37 28 52.4

γ Gruis, 21^{h} 46^{m} 23^{s}.

August 31 . . −37 57 5.8

Lacaille 8965, 21^{h} 48^{m} 46^{s}.

September 14 . . −31 13 45.9
20 . . 46.0
27 . . 47.1

B. A. C. 7632, 21^{h} 48^{m} 55^{s}.

September 23 . . −37 50 40.9
24 . . 40.4

Weisse 1139, 21^{h} 49^{m} 51^{s}.

September 28 . . − 5 20 52.9

18 Pegasi, 21^{h} 53^{m} 56^{s}.

August 31 . . + 6 7 8.9

Lacaille 9000, 21^{h} 55^{m} 18^{s}.

September 24 . . −32 44 8.3

Lacaille 9004, 21^{h} 56^{m} 5^{s}.

1875. ° ′ ″
September 14 . . −30 30 22.3
20 . . 21.9
27 . . 23.3
29 . . 21.7

λ Gruis, 21^{h} 58^{m} ^{s}35.

September 23 . . −40 8 43.3

32 Aquarii, 21^{h} 58^{m} 24^{s}.

September 28 . . − 1 30 36.0

B. A. C. 7697, 22^{h} 0^{m} 41^{s}.

August 31 . . −11 3 21.6

B. A. C. 7715, 22^{h} 2^{m} 55^{s}.

September 24 . . −28 54 19.6
27 . . 20.6

B. A. C. 7729, 22^{h} 4^{m} 25^{s}.

September 14 . . −27 45 58.1
20 . . 56.5
29 . . 56.7

39 Aquarii, 22^{h} 5^{m} 43^{s}.

September 23 . . −14 48 29.7

B. A. C. 7768, 22^{h} 9^{m} 39^{s}.

September 24 . . −26 31 9.2
28 . . 10.8

Lacaille 9091, 22^{h} 11^{m} 0^{s}.

September 20 . . −37 13 5.7
27 . . 9.9

45 Aquarii, 22^{h} 12^{m} 20^{s}.

1875. ° ′ ″
September 23 . . −13 55 46.2

47 Aquarii, 22^{h} 14^{m} 44^{s}.

September 29 . . −22 13 25.7

Lacaille 9119, 22^{h} 17^{m} 18^{s}.

September 27 . . −39 45 32.5

Lacaille 9127, 22^{h} 17^{m} 48^{s}.

September 24 . . −27 29 28.4

Lacaille 9135, 22^{h} 20^{m} 43^{s}.

September 23 . . −27 3 15.1

Lacaille 9142, 21^{h} 21^{m} 58^{s}.

September 29 . . −22 42 28.9

37 Pegasi, 22^{h} 23^{m} 41^{s}.

September 28 . . + 3 47 51.4

Lacaille 9167, 22^{h} 26^{m} 10^{s}.

September 27 . . −35 46 51.6

60 Aquarii, 22^{h} 27^{m} 38^{s}.

September 23 . . − 2 13 0.4

B. A. C. 7872, 22^{h} 29^{m} 38^{s}.

September 29 . . −32 18 31.4

Piazzi 154, 22^{h} 29^{m} 39^{s}.

1875. ° ′ ″
September 29 . . −32 17 16.7

19 Piscis Australis, 22^{h} 35^{m} 27^{s}.

September 23 . . −30 0 47.9

Lacaille 9292, 22^{h} 46^{m} 25^{s}.

September 23 . . −40 5 3.3

59 Pegasi, 23^{h} 5^{m} 28^{s}.

September 23 . . + 8 2 30.8

Lacaille 9447, 23^{h} 13^{m} 26^{s}.

September 23 . . −23 30 21.9

B. A. C. 8172, 23^{h} 21^{m} 20^{s}.

September 23 . . −36 13 56.7

B. A. C. 8273, S. P., 23^{h} 41^{m} 58^{s}.

May 17 . . +67 6 45.5
25 . . 46.2

B. A. C. 8355, S. P., (1st *), 23^{h} 56^{m} 14^{s}.

May 12 . . +65 24 12.4
14 . . 13.7

B. A. C. 8355, S. P., (2d *), 23^{h} 56^{m} 16^{s}.

May 12 . . +65 24 18.0
17 . . 16.3

CATALOGUE

OF

MISCELLANEOUS STARS

OBSERVED WITH THE

TRANSIT CIRCLE.

1875.

CATALOGUE

OF

MISCELLANEOUS STARS

OBSERVED IN

THE YEAR 1875

WITH

THE TRANSIT CIRCLE.

[NOTE.—Stars designated simply by hour and number (*e.g.*, XVII, 9) are from a list of zero-stars, selected by Professor Hall, to be used in a revision of the positions of the Washington Zones. "Transit Zones" and "Mural Zones" refer to the "Washington Zones, 1846–1849." The magnitudes are the means of the estimates in the individual observations.]

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1875.0.	Annual Precession.	Mean year.	No. of obs.	Mean N. P. Distance, 1875.0.	Annual Precession.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
1	B. A. C. 8375 . . .	. .	0 0 31.44	+ 3.070	5.9	3	129 34 27.0	— 20.05	5.9	3
2	B. A. C. 8376 . . .	8.8	1 1.95	3.067	6.0	3	131 10 32.8	20.05	6.0	3
3	4 Ceti	. .	1 19.97	3.072	5.9	3	93 14 42.6	20.05	5.9	3
4	B. A. C. 2	. .	1 42.17	3.066	6.0	3	124 13 33.8	20.05	6.0	3
5	5 Ceti	. .	1 48.09	3.072	5.9	3	93 8 39.3	20.05	5.9	3
6	B. A. C. 5	. .	0 2 18.82	+ 3.072	5.9	3	92 55 7.0	— 20.05	5.9	3
7	B. A. C. 22	. .	4 58.52	3.047	5.9	3	131 4 7.9	20.05	5.9	3
8	B. A. C. 24	7.0	5 22.54	3.050	5.9	3	125 49 59.5	20.05	5.9	4
9	Lamont 18	8.0	6 15.82	3.071	5.8	3	91 55 21.5	20.04	5.8	3
10	B. A. C. 38	. .	8 57.99	3.027	5.8	3	130 47 28.8	20.04	5.8	3
11	B. A. C. 69	8.2	0 14 40.81	+ 3.001	5.7	3	129 55 57.7	— 20.01	5.7	3
12	Lalande 512 . . .	6.0	18 59.76	3.075	5.8	3	88 45 9.9	19.98	5.8	3
13	B. A. C. 104 . . .	. .	22 16.39	2.961	5.7	3	130 36 21.4	19.96	5.7	4
14	B. A. C. 118. . . .	. .	24 21.14	2.952	5.7	3	130 12 26.7	19.94	5.7	3
15	B. A. C. 136	. .	27 36.13	2.957	5.8	4	125 40 25.9	19.91	5.7	3
16	B. A. C. 144	. .	0 28 33.69	+ 2.939	5.7	3	128 41 7.5	— 19.90	5.7	3
17	B. A. C. 166 . . .	. .	32 38.81	3.183	5.6	10	59 49 24.7	19.85	5.6	9
18	B. A. C. 192 . . .	6.0	36 41.89	2.899	5.7	3	129 8 56.7	19.80	5.7	3
19	B. A. C. 202 . . .	6.0	38 9.29	2.892	5.7	3	129 6 38.8	19.77	5.7	3
20	Weisse 753	. .	44 36.40	3.085	5.8	3	87 12 33.6	19.67	5.8	3
21	B. A. C. 237	6.5	0 44 52.24	+ 3.085	5.8	1	87 17 37.5	— 19.67	5.8	1
22	B. A. C. 259	. .	49 49.20	3 296	5.7	7	52 10 44.9	19.58	5.7	6
23	Schjellerup 337 . .	. .	51 51.82	3.091	5.8	3	86 22 44.7	19.54	5.8	3
24	Durch. 3°, 133 . . .	. .	52 15.29	3.091	5.8	3	86 28 11.6	19.53	5.8	3
25	B. A. C. 272 . . .	. .	52 34.99	2.896	5.7	3	120 1 59.9	19.53	5.7	3

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1875.0.	Annual Precession.	Mean year.	No. of obs.	Mean N. P. Distance, 1875.0.	Annual Precession.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
26	Lalande 1799	. .	0 55 54.30	+ 3.097	5.8	3	85 37 10.7	− 19.46	5.8	2
27	B. A. C. 289	. .	56 28.25	2.867	5.7	3	122 13 31.0	19.45	5.7	3
28	Weisse 982	. .	57 13.06	3.098	5.7	4	85 26 9.8	19.43	5.7	4
29	B. A. C. 303	6.5	58 24.17	3.102	5.8	5	85 0 51.3	19.40	5.8	5
30	B. A. C. 326	. .	1 1 46.77	2.837	5.6	3	123 28 54.7	19.33	5.6	3
31	B. A. C. 332	. .	1 2 18.18	+ 3.003	5.8	4	100 50 44.4	− 19.32	5.8	4
32	B. A. C. 334	. .	2 44.23	3.325	5.5	19	55 2 34.5	19.31	5.5	18
33	B. A. C. 355	. .	5 16.44	2.829	5.7	3	122 54 49.2	19.24	5.7	3
34	B. A. C. 362	. .	6 28.86	2.838	5.8	3	121 27 52.3	19.22	5.8	3
35	B. A. C. 366	. .	6 58.27	2.794	5.9	3	125 52 10.3	19.20	5.9	3
36	B. A. C. 411	. .	1 16 28.16	+ 2.734	5.9	2	127 42 21.7	− 18.95	5.9	3
37	B. A. C. 415	. .	17 1.32	2.737	6.0	3	127 15 1.4	18.93	6.0	3
38	B. A. C. 421	. .	17 42.00	2.799	6.0	3	121 35 52.2	18.91	6.0	3
39	B. A. C. 424	. .	18 23.02	2.787	5.9	3	122 27 43.7	18.89	5.9	4
40	B. A. C. 445	. .	22 55.10	2.793	5.8	3	120 32 26.4	18.75	5.8	3
41	B. A. C. 458	. .	1 25 41.85	+ 2 783	5.7	3	120 37 49.4	− 18.67	5.7	3
42	B. A. C. 466	. .	27 20.42	2.691	5.7	3	127 30 28.7	18.62	5.7	3
43	B. A. . C 489^1	. .	30 21.85	2.769	5.4	3	120 32 54.6	18.51	5.4	3
44	B. A. C. 526	. .	35 58.08	2.636	5.7	3	128 46 4.5	18.32	5.7	3
45	B. A. C. 528	. .	36 32.32	2.653	5.6	4	127 27 50.0	18.30	5.6	4
46	B. A. C. 536	. .	1 38 15.73	+ 2.907	5.7	3	106 35 47.8	− 18.24	5.7	3
47	B. A. C. 553	. .	42 20.26	2.625	5.7	4	127 47 4.0	18.09	5.7	4
48	Weisse 767	. .	44 14.13	3.180	5.8	3	79 34 35.9	18.02	5.8	3
49	Weisse 791^1	. .	45 24.27	3.179	5.8	2	79 48 30.8	17.97	5.8	2
50	Weisse 791^2	. .	45 24.31	3.179	5.8	2	79 48 27.4	17.97	5.8	3
51	B. A. C. 569	3.5	1 45 57.58	+ 3.403	5.8	5	61 1 52.0	− 17.95	5.8	4
52	B. A. C. 570	. .	46 6.52	2.563	5.9	3	130 27 15.5	17.94	5.9	3
53	B. A. C. 578	. .	48 0.27	2.577	5.9	3	129 12 46.2	17.87	5.9	3
54	B. A. C. 609	7.0	52 44.47	3.203	5.8	3	78 18 44.5	17.68	5.8	3
55	Durch. 2°, 315	. .	55 22.55	3.098	5.7	1	87 43 35.4	17.56	5.7	1
56	B. A. C. 625^1	. .	1 55 34.73	+ 3.097	5.8	3	87 50 25.1	− 17.56	5.8	2
57	B. A. C. 625^2	3.5	55 34.90	3.097	5.8	4	87 50 28.3	17.56	5.7	3
58	B. A. C. 627	6.0	55 39.91	2.690	5.7	3	120 36 12.5	17.55	5.7	3
59	Durch. 10°, 285	. .	58 11.09	3.191	5.9	4	79 47 43.7	17.45	5.9	4
60	B. A. C. 713	7.0	2 12 1.99	2.532	5.3	3	126 33 52.5	16.82	5.2	4
61	B. A. C. 746	. .	2 17 57.23	+ 2.477	5.3	3	128 8 40.7	− 16.53	5.3	3
62	B. A. C. 751	. .	19 32.09	2.398	5.0	1	131 24 42.9	16.45	5.0	1
63	Lalande 4528	. .	20 38.89	3.294	5.8	3	73 55 4.9	16.40	5.8	3
64	B. A. C. 765	. .	22 44.44	2.539	5.8	2	124 22 19.6	16.29	5.8	3
65	B. A. C. 783	. .	27 5.76	2.470	5.5	3	126 58 51.1	16.06	5.5	3

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1875.0.	Annual Precession.	Mean year.	No. of obs.	Mean N. P. Distance, 1875.0.	Annual Precession.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
66	B. A. C. 788 . . .	. .	2 27 54.34	+ 2.505	5.4	2	125 12 3.2	— 16.02	5.5	3
67	Lalande 4803 . . .	. .	29 13.85	3.161	6.0	5	83 42 39.0	15.95	6.0	5
68	Lalande 4830 . . .	. .	30 34.20	3.692	5.9	1	52 48 55.9*	15.88	5.9	1
69	B. A. C. 812 . . .	. .	32 55.32	2.580	5.8	3	120 44 0.1	15.75	5.6	4
70	B. A. C. 818 . . .	. .	33 22.35	2.412	5.8	4	128 31 47.1	15.73	5.8	4
71	B. A. C. 832 . . .	. .	2 35 44.05	+ 2.358	5.8	3	130 23 29.9	— 15.60	5.8	3
72	B. A. C. 840 . . .	. .	37 8.04	2.389	5.8	3	128 55 4.7	15.52	5.8	3
73	B. A. C. 853 . . .	. .	38 29.20	2.329	5.9	3	131 3 36.3	15.45	5.9	3
74	B. A. C. 855 . . .	. .	39 5.93	2.516	5.8	3	123 3 14.1	15.41	5.8	3
75	B. A. C. 873 . . .	. .	42 29.53	2.438	5.9	3	126 4 23.1	15.22	5.9	3
76	B. A. C. 872 . . .	. .	2 42 37.78	+ 3.511	5.9	4	63 15 22.9	— 15.22	5.9	4
77	B. A. C. 871 . . .	. .	42 41.90	3.748	5.8	4	52 11 51.4	15.21	5.8	5
78	B. A. C. 878^{1} . . .	. .	43 38.56	2.390	5.9	3	127 55 26.1	15.16	5.9	3
79	B. A. C. 879 . . .	. .	43 51.58	2.504	5.9	3	122 55 55.6	15.14	5.9	3
80	B. A. C. 881 . . .	5.5	44 35.62	3.301	5.3	4	75 26 4.0	15.10	5.3	4
81	B. A. C. 886 . . .	. .	2 45 11.51	+ 2.423	5.9	3	126 21 45.0	— 15.07	5.9	3
82	Weisse 794	. .	47 11.42	3.144	6.0	2	85 24 9.5	14.95	6.0	2
83	B. A. C. 902 . . .	. .	48 40.46	2.347	5.8	2	128 56 59.5	14.86	5.8	2
84	ρ² Arietis	. .	48 47.07	3.361	5.8	3	72 10 34.6	14.86	5.8	3
85	ρ³ Arietis	. .	49 22.83	3.356	5.8	3	72 28 37.0	14.82	5.8	3
86	B. A. C. 910 . . .	. .	2 50 19.34	+ 2.923	5.9	4	99 23 49.9	— 14.77	5.9	4
87	B. A. C. 921 . . .	4.0	52 4.04	3.419	5.1	3	69 9 41.0	14.66	5.1	3
88	B. A. C. 930 . . .	. .	52 40.23	2.339	5.9	2	128 41 40.2	14.63	5.9	2
89	B. A. C. 937 . . .	. .	53 31.41	2.280	5.5	3	130 48 24.3	14.58	5.5	3
90	B. A. C. 938 . . .	. .	53 32.24	2.280	5.5	3	130 48 23.9	14.58	5.5	3
91	B. A. C. 953 . . .	. .	2 57 10.27	+ 3.811	5.8	3	51 38 45.5	— 14.35	5.8	5
92	B. A. C. 984 . . .	. .	3 3 45.64	2.377	5.5	3	125 54 27.4	13.94	5.5	3
93	B. A. C. 994 . . .	5.2	6 23.73	3.044	5.3	4	91 39 55.1	13.78	5.3	4
94	B. A. C. 997 . . .	. .	6 45.77	2.522	5.8	3	119 28 51.9	13.75	5.8	3
95	B. A. C. 1003 . . .	6.5	8 7.67	2.351	5.5	3	126 24 45.7	13.66	5.5	3
96	B. A. C. 1005 . . .	. .	3 8 25.16	+ 2.501	5.9	3	120 16 19.7	— 13.65	5.9	3
97	B. A. C. 1009 . . .	. .	9 7.01	2.269	5.9	3	129 16 32.4	13.60	5.9	3
98	B. A. C. 1015 . . .	. .	9 45.22	2.356	5.9	3	126 1 27.2	13.56	5.9	3
99	B. A. C. 1013 . . .	5.0	9 45.74	2.911	5.1	2	99 17 8.1	13.56	5.1	3
100	B. A. C. 1021 . . .	. .	11 38.81	2.348	5.9	3	126 9 8.2	13.45	5.9	3
101	B. A. C. 1037 . . .	. .	3 13 57.53	+ 2.663	5.8	5	112 12 52.0	— 13.29	5.8	5
102	B. A. C. 1034 . . .	5.0	14 0.79	3.451	5.3	3	69 18 18.0	13.29	5.3	3
103	B. A. C. 1040 . . .	. .	14 41.80	3.587	5.6	3	62 50 35.2	13.24	5.6	3
104	B. A. C. 1052 . . .	6.2	16 55.81	3.529	5.6	3	65 43 13.3	13.10	5.6	3
105	B. A. C. 1057 . . .	. .	18 5.28	3.226	5.4	3	81 24 47.0	13.02	5.3	4

*This N. P. D. may be one revolution (15″.3) too great.

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1875.0.	Annual Precession.	Mean year.	No. of obs.	Mean N. P. Distance, 1875.0.	Annual Precession.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
106	B. A. C. 1060 . . .	. . .	3 18 43.53	+ 2.407	5.8	4	123 9 6.8	− 12.98	5.8	3
107	B. A. C. 1068 . . .	4.0	20 23.77	3.240	5.1	3	80 42 17.0	12.86	5.1	3
108	B. A. C. 1074 . . .	. .	21 6.08	2.315	5.9	3	126 21 34.5	12.82	5.9	3
109	B. A. C. 1085 . . .	. .	23 22.19	2.311	5.9	3	126 17 15.8	12.66	5.9	3
110	B. A. C. 1090 . . .	5.5	24 25.03	2.972	5.1	3	95 30 19.6	12.59	5.1	3
111	B. A. C. 1092 . . .	6.8	3 25 50.25	+ 3.237	5.4	3	81 3 2.6	− 12.50	5.4	3
112	B. A. C. 1100 . . .	. .	27 2.55	2.889	5.4	3	99 52 58.8	12.42	5.4	3
113	B. A. C. 1121 . . .	. .	32 2.88	2.450	5.8	3	120 14 30.9	12.07	5.8	3
114	B. A. C. 1134 . . .	. .	34 27.15	2.966	5.1	3	95 36 58.8	11.89	5.1	3
115	B. A. C. 1136^2 . . .	. .	35 17.26	2.142	5.6	3	130 45 31.8	11.84	5.6	3
116	B. A. C. 1145 . . .	. .	3 36 43.95	+ 2.124	5.6	3	131 10 15.7	− 11.74	5.6	3
117	B. A. C. 1147 . . .	6.0	37 27.37	3.550	5.1	3	66 16 53.9	11.68	5.1	4
118	B. A. C. 1149 . . .	. .	37 42.40	3.567	5.4	3	65 33 18.6	11.67	5.4	3
119	B. A. C. 1194 . . .	. .	42 53.10	2.420	5.9	3	120 32 45.2	11.29	5.9	3
120	B. A. C. 1212 . . .	7.0	46 31.26	2.960	5.6	3	95 44 10.6	11.03	5.6	3
121	B. A. C. 1216^1 . . .	8.0	3 48 0.82	+ 3.007	5.8	2	93 19 26.2	− 10.92	5.8	2
122	B. A. C. 1216^2 . . .	6.2	48 0.94	3.007	5.6	3	93 19 33.6	10.92	5.6	3
123	B. A. C. 1221 . . .	. .	49 28.98	3.530	5.6	3	67 53 2.3	10.81	5.6	3
124	B. A. C. 1236 . . .	. .	52 0.95	2.143	5.9	4	129 19 31.4	10.63	5.9	4
125	B. A. C. 1241 . . .	. .	53 45.37	3.317	5.2	3	77 51 53.8	10.49	5.2	3
126	B. A. C. 1251 . . .	5.2	3 56 30.46	+ 3.185	5.1	3	84 21 33.7	− 10.29	5.1	3
127	B. A. C. 1253 . . .	5.0	56 53.18	3.578	5.1	3	66 14 26.1	10.26	5.1	3
128	B. A. C. 1265 . . .	. .	59 16.92	3.704	5.4	4	61 20 20.3	10.08	5.4	5
129	B. A. C. 1275 . . .	6.0	4 2 2.84	3.342	5.1	5	76 56 6.5	9.87	5.1	5
130	B. A. C. 1285 . . .	7.0	4 41.10	3.179	5.1	4	84 48 15.8	9.67	5.1	4
131	B. A. C. 1294 . . .	6.0	4 6 6.96	+ 2.231	5.1	3	125 35 55.7	− 9.56	5.1	3
132	B. A. C. 1296 . . .	. .	6 49.36	3.225	5.2	2	82 36 19.4	9.51	5.2	3
133	B. A. C. 1302 . . .	7.0	8 40.64	3.391	5.6	3	74 54 50.2	9.36	5.6	3
134	B. A. C. 1310 . . .	. .	9 18.57	2.054	5.0	3	130 41 37.0	9.31	5.0	3
135	B. A. C. 1312 . . .	6.0	9 26.08	2.168	5.5	4	127 20 49.4	9.31	5.5	4
136	B. A. C. 1321 . . .	. .	4 12 4.13	+ 3.526	5.2	3	69 9 44.5	− 9.10	5.2	3
137	B. A. C. 1330 . . .	6.2	12 55.43	3.364	5.1	3	76 16 5.7	9.03	5.1	3
138	B. A. C. 1333 . . .	4.0	13 9.89	2.264	5.1	4	124 6 19.7	9.01	5.1	4
139	B. A. C. 1341 . . .	. .	14 58.63	3.640	5.8	3	64 40 3.3	8.87	5.8	3
140	B. A. C. 1342 . . .	. .	15 1.71	3.521	5.8	3	69 28 33.7	8.87	5.8	3
141	B. A. C. 1346 . . .	5.0	4 15 43.63	+ 3.445	5.1	3	72 45 10.6	− 8.81	5.1	3
142	62^2 Tauri	. .	16 27.62	3.608	5.8	3	65 59 31.5	8.75	5.8	3
143	B. A. C. 1356 . . .	. .	16 53.47	3.444	5.2	3	72 50 52.2	8.72	5.2	3
144	B. A. C. 1361 . . .	. .	17 40.15	3.482	5.8	3	71 14 49.1	8.66	5.8	3
145	B. A. C. 1365 . . .	. .	18 15.54	3.456	5.1	3	72 21 37.0	8.61	5.1	3

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			h. m. s.	s.			° ′ ″	″		
146	B. A. C. 1368 . . .	5.8	4 18 32.57	+ 2.200	5.1	3	125 50 16.5	− 8.59	5.1	4
147	B. A. C. 1372 . . .	5.0	19 20.63	2.246	5.7	3	124 18 32.7	8.53	5.7	3
148	B. A. C. 1370 . . .	. .	19 32.73	3.384	5.6	3	75 34 16.5	8.52	5.6	3
149	B. A. C. 1373 . . .	. .	20 35.75	3.546	5.9	3	68 39 40.5	8.43	5.9	3
150	B. A. C. 1378 . . .	. .	21 18.61	3.386	6.0	2	75 32 21.5	8.37	6.0	2
151	B. A. C. 1386 . . .	7.0	4 22 4.52	+ 3.096	5.1	3	88 53 54.5	− 8.31	5.1	3
152	B. A. C. 1389 . . .	. .	22 24.87	2.021	5.7	3	130 48 45.4	8.28	5.7	3
153	B. A. C. 1388 . . .	. .	22 58.22	3.506	5.9	2	70 26 3.1	8.24	5.9	2
154	Anonymous . . .	. .	23 37.72	3.278	5.2	1	80 25 50.7	8.19	5.2	1
155	B. A. C. 1407 . . .	. .	26 7.21	2.184	5.1	4	125 55 34.4	7.99	5.1	4
156	B. A. C. 1427 . . .	7.2	4 29 47.73	+ 2.989	5.1	4	93 52 10.8	− 7.69	5.1	4
157	B. A. C. 1431 . . .	6.3	30 47.22	3.088	5.1	4	89 15 26.3	7.61	5.1	4
158	B. A. C. 1434 . . .	. .	31 10.29	3.341	5.2	3	77 44 31.8	7.58	5.2	3
159	B. A. C. 1440 . . .	. .	32 13.38	2.337	5.3	4	120 41 0.8	7.50	5.2	5
160	B. A. C. 1442 . . .	6.5	33 5.93	3.335	5.6	3	78 3 0.2	7.42	5.6	3
161	B. A. C. 1449 . . .	5.0	4 34 44.64	+ 3.594	5.1	3	67 17 7.1	− 7.29	5.1	4
162	B. A. C. 1453 . . .	7.0	35 39.75	3.624	5.8	3	66 9 0.7	7.21	5.8	3
163	B. A. C. 1460 . . .	6.0	37 30.18	3.314	5.2	2	79 5 19.9	7.06	5.4	3
164	B. A. C. 1464 . . .	6.0	37 38.28	2.116	5.1	3	127 23 23.9	7.06	5.1	3
165	B. A. C. 1467 . . .	6.0	38 19.50	2.319	5.4	3	120 59 58.9	7.00	5.4	3
166	B. A. C. 1480 . . .	7.0	4 41 12.04	+ 2.216	5.1	4	124 14 3.8	− 6.76	5.1	4
167	B. A. C. 1483 . . .	5.5	41 42.16	2.031	5.4	3	129 35 1.0	6.72	5.4	3
168	B. A. C. 1488 . . .	. .	42 57.00	2.336	5.5	2	120 15 1.7	6.62	5.6	3
169	B. A. C. 1486 . . .	3.8	43 3.30	3.221	5.1	3	83 15 33.9	6.60	5.1	3
170	B. A. C. 1493 . . .	6.5	44 3.78	3.498	5.1	3	71 22 30.3	6.52	5.1	3
171	B. A. C. 1515 . . .	6.0	4 47 50.96	+ 3.324	5.1	3	78 46 49.6	− 6.21	5.1	3
172	B. A. C. 1519 . . .	. .	48 25.61	3.078	5.1	3	89 44 12.5	6.16	5.1	3
173	B. A. C. 1528 . . .	. .	50 30.47	3.663	5.6	3	65 8 41.2	5.99	5.6	3
174	B. A. C. 1533 . . .	6.5	50 43.74	2.008	5.3	3	129 49 53.7	5.97	5.3	3
175	Lalande 9335 . . .	. .	51 51.71	3.399	5.4	3	75 38 39.6	5.87	5.4	3
176	B. A. C. 1537 . . .	. .	4 51 53.95	+ 3.399	5.4	3	75 39 1.6	− 5.87	5.4	3
177	B. A. C. 1551 . . .	. .	55 37.50	3.576	5.2	3	68 35 28.5	5.56	5.2	3
178	Lalande 9484 . . .	. .	56 49.12	3.742	5.8	3	62 28 50.6	5.46	5.8	3
179	B. A. C. 1564 . . .	6.0	57 39.09	2.269	5.1	5	121 57 16.5	5.38	5.1	5
180	B. A. C. 1573 . . .	5.2	59 54.70	2.146	5.1	4	125 39 20.2	5.20	5.1	4
181	B. A. C. 1574 . . .	. .	4 59 58.52	+ 2.138	5.7	3	125 52 51.5	− 5.19	5.7	3
182	B. A. C. 1568 . . .	5.0	5 0 3.73	3.504	5.1	3	71 31 30.0	5.18	5.1	3
183	B. A. C. 1570 . . .	. .	0 24.63	3.549	5.6	3	69 44 55.5	5.16	5.6	3
184	B. A. C. 1588 . . .	3.0	1 42.33	2.953	6.0	3	95 15 0.1	5.05	5.8	4
185	B. A. C. 1591 . . .	5.0	2 32.72	3.430	5.1	3	74 33 52.9	4.98	5.1	3

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			h. m. s.	s.			° ′ ″	″		
186	B. A. C. 1599 . . .	7.5	5 3 47.75	+ 2.134	5.6	3	125 52 52.5	− 4.87	5.6	3
187	B. A. C. 1601 . . .	. .	4 30.81	3.442	5.2	3	74 6 41.5	4.81	5.2	3
188	B. A. C. 1611 . . .	4.5	6 45.42	3.134	5.1	3	87 17 23.3	4.61	5.1	3
189	Durch. 27°, 744 . . .	. .	9 2.42	3.753	5.1	1	62 26 ±	. .	. .	.
190	B. A. C. 1630 . . .	. .	9 20.31	2.126	5.1	3	125 58 13.3	4.40	5.1	3
191	B. A. C. 1627 . . .	. .	5 9 58.52	+ 3.928	5.6	3	56 45 40.2	− 4.34	5.6	3
192	B. A. C. 1633 . . .	. .	10 3.57	2.120	5.9	3	126 7 18.6	4.33	5.9	3
193	Weisse (2) 245 . . .	8.5	10 29.49	3.933	5.5	2	56 36 45.0	4.30	5.6	3
194	Weisse (2) 247 . . .	8.5	10 29.65	3.933	5.5	2	56 36 30.3	4.30	5.6	3
195	B. A. C. 1644 . . .	. .	11 48.77	2.201	5.6	3	123 40 34.0	4.18	5.6	3
196	B. A. C. 1650 . . .	. .	5 12 58.72	+ 2.155	5.3	3	125 1 8.0	− 4.08	5.3	3
197	B. A. C. 1660 . . .	. .	15 22.91	3.061	5.1	3	90 30 28.2	3.88	5.1	2
198	B. A. C. 1666 . . .	6.5	15 50.66	2.159	5.1	4	124 49 33.1	3.84	5.1	4
199	B. A. C. 1663 . . .	. .	16 9.49	4.071	5.2	3	52 44 3.1	3.81	5.2	3
200	B. A. C. 1665[1] . . .	. .	16 15.85	3.151	5.1	3	86 34 43.3	3.80	5.1	3
201	B. A. C. 1665[2] . . .	. .	5 16 16.89	+ 3.151	5.1	1	86 34 12.2	− 3.80	5.1	1
202	B. A. C. 1693 . . .	. .	19 16.64	1.976	5.6	3	129 47 43.7	3.54	5.6	3
203	B. A. C. 1694 . . .	. .	19 20.44	2.063	5.3	3	127 27 13.3	3.54	5.3	3
204	O. Arg. S. 3957 . . .	7.5	21 2.71	2.571	5.6	3	110 49 32.8	3.40	5.6	3
205	β Leporis	3.0	22 53.44	2.569	5.6	3	110 51 38.8	3.23	5.6	3
206	B. A. C. 1719 . . .	. .	5 23 4.83	+ 1.923	5.6	3	131 3 12.0	− 3.22	5.6	3
207	B. A. C. 1718 . . .	7.5	23 11.76	2.231	5.3	3	122 31 16.2	3.21	5.3	3
208	B. A. C. 1717 . . .	4.0	23 23.18	3.045	5.1	3	91 11 34.6	3.19	5.1	3
209	B. A. C. 1724 . . .	. .	23 56.85	2.065	5.7	3	127 20 9.3	3.15	5.7	3
210	B. A. C. 1726 . . .	3.5	24 53.03	3.514	5.1	3	71 30 4.2	3.06	5.1	3
211	B. A. C. 1739 . . .	4.0	5 26 46.67	+ 2.126	5.4	3	125 33 49.3	− 2.89	5.4	3
212	B. A. C. 1742 . . .	2.0	27 49.11	3.660	5.1	3	66 2 45.3	2.81	5.1	4
213	B. A. C. 1753 . . .	. .	28 39.10	2.137	5.9	3	125 13 36.8	2.73	5.9	3
214	B. A. C. 1762[1] . . .	. .	29 19.16	2.933	5.4	4	95 59 37.5	2.68	5.4	4
215	B. A. C. 1762[2] . . .	. .	29 19.66	2.933	5.1	1	95 59 47.6	2.68	5.1	1
216	B. A. C. 1767 . . .	2.0	5 30 10.50	+ 3.583	5.1	2	68 56 9.5	− 2.60	5.1	3
217	B. A. C. 1771 . . .	4.5	30 39.50	2.206	5.6	3	123 9 57.3	2.56	5.6	3
218	B. A. C. 1773 . . .	. .	30 52.15	2.200	5.7	3	123 21 16.1	2.54	5.7	3
219	B. A. C. 1792 . . .	. .	34 4.28	3.465	5.1	3	73 32 0.1	2.26	5.1	3
220	B. A. C. 1794 . . .	. .	34 27.07	3.026	5.3	3	92 0 40.2	2.23	5.3	4
221	B. A. C. 1798 . . .	. .	5 34 42.75	+ 1.926	5.4	3	130 46 45.4	− 2.21	5.4	3
222	B. A. C. 1806 . . .	5.0	36 0.82	3.105	5.1	2	88 35 16.9	2.10	5.1	3
223	B. A. C. 1814 . . .	5.0	37 46.35	2.150	5.1	3	124 43 51.7	1.94	5.1	3
224	B. A. C. 1825 . . .	. .	39 22.53	1.976	5.4	3	129 27 45.4	1.80	5.4	3
225	B. A. C. 1831 . . .	. .	40 8.16	3.098	5.8	3	88 52 37.5	1.74	5.8	3

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1875.0.	Annual Precession.	Mean year.	No. of obs.	Mean N. P. Distance, 1875.0.	Annual Precession.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
226	B. A. C. 1842 . . .	. .	5 41 16.66	+ 1.979	5.1	1	129 21 54.2	— 1.63	5.1	1
227	B. A. C. 1841 . . .	. .	41 21.25	2.228	5.7	3	122 21 19.3	1.63	5.7	3
228	B. A. C. 1843 . . .	. .	41 49.78	2.844	5.6	2	99 42 57.1	1.59	5.6	2
229	B. A. C. 1847 . . .	. .	42 20.35	2.094	5.2	1	126 16 43.6	1.55	5.2	1
230	B. A. C. 1845 . . .	4.0	42 49.60	4.157	5.8	4	50 53 26.5	1.50	5.8	3
231	B. A. C. 1859 . . .	. .	5 43 45.88	+ 2.191	5.1	3	123 28 23.5	— 1.42	5.1	3
232	Weisse 1110 . . .	7.0	44 56.63	3.414	5.8	1	75 37 48.4	1.32	5.8	1
233	B. A. C. 1865 . . .	7.0	45 8.95	2.281	5.1	1	120 39 33.8	1.30	5.1	1
234	B. A. C. 1862 . . .	. .	45 16.26	3.408	6.0	3	75 51 43.8	1.29	6.0	3
235	B. A. C. 1878 . . .	2.0	46 33.19	2.109	5.1	3	125 49 0.3	1.17	5.1	3
236	B. A. C. 1889 . . .	. .	5 48 17.61	+ 2.042	5.2	1	127 39 36.2	— 1.02	5.2	1
237	B. A. C. 1891 . . .	. .	48 34.67	2.177	5.6	2	123 49 50.0	1.00	5.6	2
238	B. A. C. 1892 . . .	. .	48 36.49	2.008	5.1	1	128 33 16.6	1.00	5.1	1
239	B. A. C. 1882 . . .	. .	48 37.38	3.810	5.9	3	61 4 48.8	1.00	5.9	3
240	B. A. C. 1896 . . .	. .	50 14.24	3.722	6.0	3	64 3 49.8	0.86	6.0	3
241	B. A. C. 1904 . . .	6.0	5 50 48.49	+ 1.952	5.4	3	129 58 51.4	— 0.81	5.4	3
242	B. A. C. 1900 . . .	. .	51 11.78	4.086	5.4	3	52 47 56.0	0.77	5.5	4
243	B. A. C. 1910 . . .	7.0	51 38.71	2.257	5.1	3	121 24 4.6	0.73	5.1	3
244	B. A. C. 1907 . . .	. .	51 51.22	3.376	5.6	3	77 12 21.9	0.71	5.6	3
245	B. A. C. 1922 . . .	. .	53 6.38	2.126	5.1	3	125 17 53.5	0.60	5.1	3
246	B. A. C. 1925 . . .	. .	5 54 8.73	+ 3.623	5.9	3	67 36 17.6	— 0.52	5.9	3
247	B. A. C. 1930 . . .	8.0	55 39.92	3.498	5.9	3	72 20 9.8	0.38	5.9	3
248	B. A. C. 1938 . . .	. .	56 31.25	3.647	5.2	4	66 43 57.4	— 0.31	5.2	4
249	B. A. C. 1976 . . .	6.5	6 2 33.55	2.160	5.1	4	124 17 52.2	+ 0.23	5.1	4
250	B. A. C. 1982 . . .	6.0	3 14.52	2.056	5.1	4	127 14 13.3	0.28	5.1	4
251	B. A. C. 1989 . . .	6.5	6 4 50.78	+ 3.459	5.8	4	73 50 36.4	+ 0.42	5.8	4
252	B. A. C. 1996 . . .	. .	6 4.01	2.143	5.1	3	124 47 31.2	0.53	5.1	3
253	B. A. C. 1998 . . .	. .	6 8.45	1.938	5.1	3	130 19 57.1	0.53	5.1	3
254	B. A. C. 2012 . . .	5.0	8 43.67	3.371	5.2	3	77 24 43.4	0.76	5.2	3
255	B. A. C. 2016 . . .	7.0	9 21.16	3.661	5.9	6	66 13 9.2	0.82	5.9	5
256	B. A. C. 2035 . . .	. .	6 12 27.87	+ 1.983	5.6	3	129 13 11.7	+ 1.09	5.6	3
257	B. A. C. 2051 . . .	. .	15 30.90	2.302	5.9	3	120 0 31.8	1.36	5.9	3
258	B. A. C. 2061 . . .	. .	17 11.82	2.642	5.3	2	107 53 43.4	1.50	5.3	2
259	B. A. C. 2066 . . .	. .	17 32.70	2.194	5.1	1	123 22 30.0	1.53	5.1	1
260	B. A. C. 2063 . . .	. .	17 56.19	3.652	6.0	3	66 29 30.0	1.56	6.0	3
261	B. A. C. 2064 . . .	6.5	6 17 57.04	+ 3.649	5.4	3	66 36 23.4	+ 1.57	5.4	3
262	B. A. C. 2072 . . .	. .	18 31.51	2.275	5.2	1	120 52 58.4	1.62	5.2	1
263	B. A. C. 2073 . . .	. .	18 33.83	2.248	5.1	1	121 43 37.8	1.63	5.1	1
264	B. A. C. 2077 . . .	8.0	19 26.42	2.070	5.1	2	126 56 57.7	1.70	5.1	2
265	B. A. C. 2079 . . .	. .	19 40.88	2.082	5.1	1	126 38 39.6	1.72	5.1	1

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			h. m. s.	s.			° ′ ″	″		
266	Brisbane 1230	. .	6 19 46.14	+ 2.082	5.1	1	126 38 10.2	+ 1.72	5.1	1
267	B. A. C. 2089	. .	20 41.15	1.946	5.4	3	130 12 54.1	1.81	5.4	3
268	B. A. C. 2098	8.4	21 46.46	1.920	5.1	3	130 54 9.4	1.90	5.1	3
269	B. A. C. 2109	5.5	23 32.21	2.225	5.2	3	122 30 11.9	2.05	5.2	3
270	B. A. C. 2112	6.0	24 0.17	2.232	5.4	3	122 17 32.1	2.10	5.4	3
271	B. A. C. 2117	. .	6 24 42.41	+ 1.917	5.1	1	130 59 40.3	+ 2.16	5.1	1
272	B. A. C. 2122	. .	25 3.43	1.946	5.1	1	130 17 30.2	2.19	5.1	1
273	Brisbane 1256	. .	25 9.02	1.946	5.1	1	130 18 ±	. .	. .	.
274	B. A. C. 2135	. .	26 37.72	1.944	5.4	3	130 22 6.6	2.32	5.4	3
275	B. A. C. 2136	4.0	26 45.90	2.137	5.1	1	125 10 17.8	2.34	5.1	1
276	B. A. C. 2138	8.0	6 26 59.35	+ 1.925	5.2	1	130 49 47.8	+ 2.36	5.2	1
277	B. A. C. 2141	. .	27 15.19	2.077	5.1	1	126 51 13.9	2.38	5.1	1
278	B. A. C. 2134	7.5	27 16.64	3.543	5.4	3	70 28 37.8	2.38	5.4	3
279	B. A. C. 2158	. .	29 26.55	2.104	5.7	3	126 8 23.4	2.58	5.7	3
280	B. A. C. 2162	. .	29 57.33	2.224	5.1	1	122 37 7.1	2.62	5.1	1
281	B. A. C. 2164	. .	6 30 10.72	+ 2.181	5.5	2	123 54 45.0	+ 2.64	6.0	1
282	Lalande 12661	. .	30 27.33	3.809	5.8	3	60 54 39.4	2.66	5.8	3
283	B. A. C. 2179	6.0	32 47.34	2.037	5.2	1	128 2 34.5	2.86	5.2	1
284	B. A. C. 2183	. .	33 6.73	2.238	5.4	3	122 14 5.5	2.89	5.4	3
285	B. A. C. 2184	7.5	34 9.22	3.464	5.4	3	73 29 18.0	2.98	5.4	3
286	B. A. C. 2190	. .	6 34 24.03	+ 2.044	5.1	3	127 53 7.0	+ 3.00	5.1	3
287	B. A. C. 2195	. .	35 41.46	2.039	5.4	3	128 2 38.0	3.11	5.4	3
288	B. A. C. 2194	2.0	36 14.41	3.695	5.5	5	64 44 50.8	3.15	5.5	5
289	B. A. C. 2202	8.0	37 9.68	1.956	5.6	3	130 13 54.8	3.24	5.6	3
290	B. A. C. 2214	6.5	39 43.16	2.282	5.8	2	120 56 39.4	3.46	5.8	2
291	B. A. C. 2228	6.0	6 42 38.09	+ 3.458	5.4	3	73 39 27.0	+ 3.71	5.4	3
292	B. A. C. 2231	. .	43 4.85	2.053	5.9	1	127 47 36.6	3.75	5.9	1
293	B. A. C. 2238	. .	44 24.63	3.649	5.8	3	66 15 9.9	3.86	5.8	3
294	B. A. C. 2246	. .	45 10.35	2.241	5.9	1	122 22 1.1	3.93	5.9	1
295	B. A. C. 2252	5.5	46 19.62	2.182	5.5	2	124 13 17.6	4.02	5.5	2
296	B. A. C. 2258	7.5	6 47 17.92	+ 2.119	5.8	1	126 4 45.4	+ 4.11	5.8	1
297	B. A. C. 2255	. .	47 35.54	3.382	5.2	3	76 39 56.9	4.14	5.2	3
298	B. A. C. 2282	6.0	52 16.42	2.154	5.1	3	125 10 41.5	4.54	5.1	3
299	B. A. C. 2288	6.0	52 49.30	2.149	5.4	3	125 20 36.5	4.58	5.4	2
300	B. A. C. 2285	. .	53 4.81	3.451	5.9	3	73 45 1.4	4.60	5.9	3
301	B. A. C. 2309	. .	6 56 44.32	+ 2.390	6.0	3	117 45 24.8	+ 4.91	6.0	3
302	B. A. C. 2313	5.0	57 46.77	3.617	5.5	4	67 10 40.0	5.00	5.5	4
303	Lalande 13681	. .	58 20.12	3.771	5.2	2	61 37 22.2	5.05	5.2	2
304	B. A. C. 2322	. .	58 48.31	3.286	5.9	3	80 37 36.6	5.09	5.9	3
305	Lalande 13700	. .	58 54.20	3.771	5.2	2	61 35 49.1	5.10	5.2	2

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			h. m. s.	s.			° ′ ″	″		
306	Lalande 13724 . . .	. .	6 59 34.36	+ 3.770	5.2	2	61 38 1.5	+ 5.16	5.2	2
307	Lalande 13757 . . .	. .	7 0 28.94	3.770	5.2	2	61 35 43.3	5.23	5.2	2
308	B. A. C. 2335 . . .	. .	1 44.82	2.058	5.1	1	128 11 31.9	5.33	5.1	1
309	B. A. C. 2340 . . .	. .	3 10.87	3.828	5.9	3	59 33 6.7	5.46	5.9	3
310	47 Geminorum. . . .	. .	3 37.83	3.729	5.9	3	62 56 24.0	5.49	5.9	3
311	Durch. 28°, 1331 . .	. .	7 3 51.30	+ 3.767	5.2	2	61 36 25.8	+ 5.52	5.2	2
312	Lalande 13905 . . .	. .	4 34.84	3.767	5.2	2	61 35 0.4	5.58	5.2	2
313	B. A. C. 2355 . . .	. .	4 39.20	2.016	5.9	3	129 27 21.8	5.59	5.9	3
314	B. A. C. 2364 . . .	. .	7 3.17	3.672	5.6	5	64 54 0.3	5.79	5.6	5
315	B. A. C. 2385 . . .	. .	8 58.62	2.309	5.1	1	120 52 14.2	5.95	5.1	1
316	B. A. C. 2398 . . .	. .	7 10 54.47	+ 3.456	5.9	3	73 14 10.6	+ 6.10	5.9	3
317	B. A. C. 2422 . . .	. .	13 51.71	2.134	5.7	4	126 30 27.6	6.35	5.7	4
318	B. A. C. 2425 . . .	. .	14 11.53	2.134	5.7	4	126 30 55.5	6.38	5.7	4
319	B. A. C. 2434 . . .	. .	15 57.40	3.613	5.9	4	66 48 58.9	6.53	5.9	4
320	B. A. C. 2446 . . .	. .	17 49.42	2.290	5.1	1	121 48 29.4	6.68	5.1	1
321	B. A. C. 2444 . . .	. .	7 18 1.51	+ 3.338	5.6	3	78 5 16.0	+ 6.69	5.5	4
322	B. A. C. 2456 . . .	. .	19 1.28	2.346	5.1	1	119 58.5	. .	. .	.
323	B. A. C. 2462 . . .	2.5	20 22.21	3.261	5.6	3	81 27 39.4	6.89	5.6	3
324	B. A. C. 2469 . . .	. .	22 2.08	3.743	5.9	4	61 49 40.9	7.02	5.9	3
325	B. A. C. 2471 . . .	. .	22 3.75	2.232	5.2	1	123 53 27.9	7.03	5.2	1
326	B. A. C. 2477^1 . . .	. .	7 24 3.10	+ 2.305	5.7	3	121 35 33.0	+ 7.20	5.7	3
327	B. A. C. 2477^2 . . .	. .	24 3.72	2.305	5.7	3	121 35 26.6	7.20	5.7	3
328	B. A. C. 2493 . . .	. .	28 13.00	3.708	5.4	3	62 49 41.8	7.53	5.4	3
329	B. A. C. 2506 . . .	7.5	30 40.37	3.638	5.6	3	65 21 40.7	7.73	5.6	3
330	B. A. C. 2523 . . .	. .	32 44.47	2.221	5.1	1	124 41 17.5	7.89	5.1	1
331	B. A. C. 2543 . . .	. .	7 35 3.09	+ 2.016	5.5	2	128 1 21.1	+ 8.09	5.5	2
332	B. A. C. 2546 . . .	. .	35 23.24	2.118	5.9	1	127 58 24.3	8.11	5.9	1
333	Anonymous . . .	. .	37 40.00	3.507	6.0	1	70 20 36.5	8.29	6.0	1
334	B. A. C. 2561 . . .	. .	38 37.57	2.198	5.1	1	125 45 15.7	8.36	5.1	1
335	B. A. C. 2564 . . .	6.5	39 23.30	3.310	5.6	3	78 55 43.1	8.43	5.6	3
336	B. A. C. 2575 . . .	. .	7 40 7.28	+ 2.138	5.2	1	127 38 36.6	+ 8.48	5.2	1
337	Lacaille 2956 . . .	8.0	40 37.40	2.141	5.2	1	127 35 13.3	8.52	5.2	1
338	B. A. C. 2580 . . .	4.0	40 48.15	2.138	5.2	3	127 40 1.3	8 54	5.2	3
339	B. A. C. 2588 . . .	. .	41 43.16	2.141	5.2	2	127 37 48.8	8.61	5.2	2
340	B. A. C. 2595 . . .	. .	42 59.54	2.125	5.1	1	128 12 10.9	8.71	5.1	1
341	B. A. C. 2592 . . .	7.0	7 42 59.97	+ 3.871	5.4	3	56 27 11.9	+ 8.71	5.4	3
342	B. A. C. 2604 . . .	6.0	43 52.24	2.052	5.1	1	130 20 28.4	8.79	5.1	1
343	B. A. C. 2605 . . .	. .	44 40.42	3.501	5.9	2	70 21 24.7	8.85	5.9	2
344	B. A. C. 2629 . . .	. .	47 35.55	2.256	5.1	1	124 23 34.6	9.07	5.1	1
345	B. A. C. 2635 . . .	. .	48 13.29	2.124	5.1	1	128 32 28.4	9.12	5.1	1

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			h. m. s.	s.			° ′ ″	″		
346	B. A. C. 2632 . . .	. .	7 48 22.10	+ 3.511	5.9	3	69 47 17.2	+ 9.14	5.9	3
347	B. A. C. 2646 . . .	. .	49 57.99	2.257	5.1	2	124 31 9.6	9.26	5.1	2
348	B. A. C. 2653 . . .	5.5	51 51.74	3.125	5.4	3	87 26 37.2	9.41	5.4	3
349	B. A. C. 2655 . . .	. .	52 41.25	2.392	5.1	1	119 59 57.3	9.47	5.1	1
350	ω^1 Cancri	. .	53 21.91	3.639	5.9	3	64 16 1.8	9.52	5.9	3
351	B. A. C. 2659 . . .	. .	7 53 37.39	+ 3.446	5.9	3	72 21 2.0	+ 9.54	5.9	3
352	B. A. C. 2671 . . .	. .	55 3.72	2.125	5.1	2	128 57 19.0	9.65	5.1	2
353	B. A. C. 2676 . . .	7.0	56 27.55	3.554	5.2	3	67 34 51.3	9.76	5.2	3
354	B. A. C. 2690 . . .	. .	58 6.59	3.350	5.2	3	76 31 39.0	9.88	5.2	3
355	B. A. C. 2699 . . .	. .	58 11.52	2.342	5.1	1	122 6 51.4	9.89	5.1	1
356	B. A. C. 2717	. .	8 0 14.35	+ 2.314	5.1	1	123 14 12.7	+ 10.04	5.1	1
357	B. A. C. 2720 . . .	. .	1 43.21	3.360	5.6	3	75 59 49.3	10.16	5.6	3
358	Lalande 15898 . . .	7.0	2 9.52	3.632	6.0	3	64 4 36.8	10.19	6.0	3
359	B. A. C. 2730 . . .	. .	2 55.23	3.630	5.9	3	64 6 55.4	10.25	5.9	3
360	B. A. C. 2735 . . .	. .	3 16.18	2.273	5.1	1	124 50 52.0	10.28	5.1	1
361	B. A. C. 2758 . . .	. .	8 6 24.70	+ 2.217	5.2	2	126 55 19.8	+ 10.51	5.2	2
362	B. A. C. 2772 . . .	. .	7 48.82	2.229	5.3	1	126 36 54.5	10.61	5.3	1
363	B. A. C. 2774 . . .	. .	8.8 . .	. .	. .	.	125 31 25.5	10.70	5.2	1
364	B. A. C. 2775 . . .	. .	9 14.53	2.372	5.1	1	121 45 47.2	10.72	5.1	1
365	B. A. C. 2788 . . .	. .	13 3.44	3.504	5.8	3	68 51 35.4	11.00	5.8	3
366	O. Arg. N. 8887 . .	. .	8 14 19.31	+ 4.452	5.2	1	38 55 14.8	+ 11.09	5.2	1
367	B. A. C. 2799 . . .	. .	16 12.32	3.448	5.6	3	71 16 4.2	11.23	5.6	3
368	B. A. C. 2805 . . .	. .	16 37.80	2.266	5.6	4	126 5 14.9	11.26	5.6	4
369	B. A. C. 2820 . . .	. .	18 39.74	2.217	5.5	2	127 53 5.6	11.51	5.5	2
370	O. Arg. N. 9001 . .	. .	20 35.79	4.426	5.2	1	38 55 18.9	11.55	5.2	1
371	O. Arg. N. 9029 . .	. .	8 21 34.70	+ 4.424	5.2	1	38 52 29.1	+ 11.62	5.2	1
372	O. Arg. N. 9058 . .	. .	23 46.99	4.413	5.2	1	38 54 54.6	11.77	5.2	1
373	B. A. C. 2877 . . .	. .	26 47.90	2.214	5.3	1	128 38 37.2	11.98	5.3	1
374	O. Arg. N. 9125 . .	. .	29 42.42	4.388	5.2	1	38 54 8.2	12.19	5.2	1
375	B. A. C. 2901 . . .	. .	31 2.33	3.186	5.8	4	83 51 43.5	12.28	5.8	4
376	O. Arg. N. 9187 . .	. .	8 33 14.31	+ 4.372	5.2	1	38 55 4.2	+ 12.43	5.2	1
377	B. A. C. 2941 . . .	. .	35 43.96	2.205	5.2	2	129 49 18.6	12.60	5.2	2
378	B. A. C. 2984 . . .	. .	42 46.05	3.749	5.7	3	56 14 57.4	13.08	5.7	3
379	B. A. C. 3009 . . .	. .	44 59.90	2.233	5.1	1	129 51 22.6	13.22	5.1	1
380	B. A. C. 3013 . . .	. .	45 48.03	3.174	5.9	3	84 11 28.4	13.27	5.9	3
381	B. A. C. 3030 . . .	. .	8 48 1.74	+ 2.289	5.2	2	128 15 13.8	+ 13.42	5.2	2
382	B. A. C. 3027 . . .	. .	48 23.38	3.925	5.9	3	49 19 17.7	13.45	5.9	3
383	B. A. C. 3081 . . .	. .	55 25.42	2.241	5.5	3	130 46 6.0	13.89	5.5	3
384	B. A. C. 3105 . . .	. .	59 23.50	3.165	5.7	3	84 24 33.4	14.14	5.7	3
385	B. A. C. 3112 . . .	. .	9 1 10.50	3.716	5.7	3	55 36 39.4	14.25	5.7	3

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			h. m. s.	s.			° ′ ″	″		
386	B. A. C. 3122 . . .	. .	9 2 58.68	+ 3.272	6.0	3	77 55 39.7	+ 14 36	6.0	3
387	B. A. C. 3146 . . .	. .	7 51.62	3.117	5.5	3	87 9 35.2	14.66	5.5	3
388	B. A. C. 3165 . . .	. .	10 44.83	2.396	5.6	2	126 53 38.1	14.83	5.6	2
389	B. A. C. 3162^1 . . .	7.0	11 3.39	3.758	5.3	1	52 40 14.1	14.85	5.3	1
390	B. A. C. 3162^2 . . .	. .	11 3.66	3.758	5.6	5	52 40 11.8	14.85	5.6	5
391	B. A. C. 3178 . . .	. .	9 13 26.07	+ 3.692	5.8	5	55 4 49.0	+ 14.98	5.8	5
392	B. A. C. 3192 . . .	. .	15 27.03	2.539	5.6	2	121 14 9.4	15.11	5.6	2
393	B. A. C. 3238 . . .	. .	23 9.66	3.646	5.3	1	55 47 48.9	15.54	5.3	1
394	B. A. C. 3250 . . .	. .	25 12.44	3.248	5.7	3	78 8 52.3	15.65	5.7	3
395	B. A. C. 3257 . . .	. .	25 46.79	2.375	5.3	1	129 55 16.6	15.68	5.3	1
396	B. A. C. 3267 . . .	. .	9 27 21.65	+ 2.377	5.3	1	130 5 50.8	+ 15.77	5.3	1
397	B. A. C. 3273 . . .	. .	29 17.60	3.577	5.6	2	58 16 45.9	15.87	5.6	2
398	B. A. C. 3295 . . .	5.5	31 56.04	3.146	5.8	3	84 47 14.7	16.01	5.8	3
399	B. A. C. 3317 . . .	6.0	36 13.35	3.536	5.7	3	59 27 8.2	16.23	5.7	3
400	B. A. C. 3321 . . .	. .	36 55.40	3.276	5.6	2	75 24 28.3	16.27	5.6	2
401	B. A. C. 3398 . . .	6.0	9 49 48.34	+ 3.193	5.3	3	80 28 32.5	+ 16.90	5.3	3
402	B. A. C. 3403 . . .	8.0	50 43.90	2.651	5.3	1	120 29 58.4	16.95	5.3	1
403	B. A. C. 3417 . . .	7.0	53 30.61	2.576	5.3	2	125 17 40.4	17.08	5.3	2
404	B. A. C. 3423 . . .	6.5	55 50.62	3.359	5.3	3	67 26 55.2	17.18	5.3	3
405	B. A. C. 3453 . . .	3.2	10 0 30.94	3.281	5.6	5	72 37 43.9	17.39	5.6	5
406	B. A. C. 3469 . . .	. .	10 3 57.11	+ 3.262	5.5	3	73 40 47.5	+ 17.54	5.5	3
407	B. A. C. 3494 . . .	. .	7 43.66	2.673	5.3	1	122 24 56.5	17.69	5.3	1
408	B. A. C. 3511 . . .	. .	10 21.80	3.343	5.6	4	66 16 3.4	17.80	5.6	4
409	B. A. C. 3532 . . .	. .	14 34.72	3.103	6.0	3	87 4 55.6	17.97	6.0	3
410	B. A. C. 3539 . . .	. .	15 50.95	3.496	6.0	2	54 9 8.2	18.02	6.0	2
411	B. A. C. 3572 . . .	4.5	10 20 38.98	+ 3.501	5.3	3	52 39 11.3	+ 18.20	5.3	3
412	B. A. C. 3575 . . .	6.0	21 2.70	3.175	5.7	2	79 36 4.4	18.21	5.6	3
413	B. A. C. 3600 . . .	6.0	24 3.52	3.099	5.3	3	87 12 32.5	18.32	5.3	3
414	B. A. C. 3622^1 . . .	5.5	28 28.54	3.157	5.8	4	80 42 15.6	18.48	5.8	4
415	B. A. C. 3625 . . .	. .	29 10.70	3.461	5.3	3	53 1 33.0	18.50	5.3	3
416	Anonymous . . .	. .	10 35 39.38	+ 3.018	5.3	2	96 26 11.2	+ 18.71	5.3	1
417	Anonymous . . .	. .	36 48.41	3.019	5.3	2	96 22 1.4	18.75	5.3	2
418	Anonymous . . .	. .	36 58.88	3.002	5.3	2	98 25 35.9	18.75	5.3	2
419	B. A. C. 3684 . . .	. .	38 43.00	3.098	5.7	3	86 51 19.8	18.81	5.7	3
420	B. A. C. 3728 . . .	. .	46 18.95	3.367	5.3	3	55 6 44.0	19.02	5.3	3
421	B. A. C. 3742^1 . . .	4.5	10 48 50.50	+ 3.267	5.3	2	64 35 3.2	+ 19.09	5.3	3
422	B. A. C. 3742^2 . . .	. .	48 50.98	3.267	5.3	2	64 35 4.8	19.09	5.3	2
423	B. A. C. 3763 . . .	. .	53 19.85	2.823	5.4	1	123 3 59.8	19.21	5.4	1
424	B. A. C. 3776 . . .	4.0	55 39.25	3.213	5.3	3	69 9 0.8	19.27	5.3	3
425	B. A. C. 3809 . . .	5.8	11 2 6.54	3.231	5.3	4	64 39 55.8	19.42	5.3	5

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			h. m. s.	s.			° ′ ″	″		
426	B. A. C. 3822	7.8	11 3 53.17	+ 2.872	5.3	1	121 41 24.6	+ 19.46	5.3	1
427	B. A. C. 3838	4.0	7 40.73	3.160	5.3	1	73 53 17.2	19.53	5.3	1
428	B. A. C. 3843	5.5	9 19.42	3.145	5.4	3	76 0 40.7	19.57	5.4	3
429	B. A. C. 3851	4.0	11 30.60	3.249	5.4	3	57 46 5.5	19.61	5.4	3
430	B. A. C. 3890	8.0	19 26.14	2.905	5.3	2	125 22 39.2	19.74	5.3	2
431	Anonymous	. .	11 19 47.58	+ 2.901	6.0	1	126 13 5.2	+ 19.75	6.0	1
432	Anonymous	. .	20 28.03	2.905	6.0	2	126 11 48.2	19.76	6.0	2
433	B. A. C. 3930	6.0	27 58.08	3.084	5.4	4	86 14 45.8	19.86	5.4	4
434	B. A. C. 3945	. .	30 23.19	2.961	5.4	1	122 52 40.8	19.89	5.4	1
435	Lacaille 4852	. .	35 11.10	2.940	6.0	1	132 24 9.7	19.94	6.0	1
436	Lalande 22168	. .	11 36 50.87	+ 3.146	5.3	1	61 15 9.0	+ 19.95	5.3	1
437	B. A. C. 3973	6.0	36 59.92	3.195	5.3	4	47 35 3.3	19.95	5.3	4
438	Lalande 22335	. .	42 42.63	3.128	5.3	1	61 11 3.0	20.00	5.3	1
439	B. A. C. 4002	6.0	44 11.23	3.076	5.6	3	87 31 52.8	20.01	5.6	3
440	Lalande 22349	. .	44 15.43	3.123	5.3	1	61 12 32.0	20.01	5.3	1
441	B. A. C. 4046	8.5	11 53 9.99	+ 3.045	5.3	3	124 36 48.4	+ 20.04	5.3	3
442	Weisse (2) 1028	. .	11 53 32.86	3.093	5.3	1	61 10 58.2	20.04	5.3	1
443	B. A. C. 4092	. .	12 2 . .	. .	. .	.	130 32 7.4	20.05	5.4	1
444	B. A. C. 4099	6.5	4 9.33	3.065	5.3	3	72 29 43.5	20.05	5.3	3
445	B. A. C. 4113	. .	6 55.30	3.104	5.4	1	128 13 59.3	20.04	5.4	2
446	B. A. C. 4124	3.3	12 9 22.80	+ 3.089	5.6	7	106 50 51.5	+ 20.04	5.6	7
447	B. A. C. 4142	6.5	13 13.77	3.030	5.4	3	61 8 41.8	20.02	5.3	2
448	B. A. C. 4184	6.0	18 57.72	3.022	5.3	4	65 22 47.5	19.98	5.3	4
449	B. A. C. 4210	. .	23 16.70	3.190	5.4	2	131 2 37.8	19.95	5.4	2
450	B. A. C. 4211	. .	23 23.87	3.111	5.7	7	105 49 10.7	19.95	5.7	7
451	B. A. C. 4212	6.0	12 23 26.41	+ 3.018	5.3	3	68 24 42.3	+ 19.95	5.3	3
452	B. A. C. 4227	. .	26 46.07	3.207	5.4	1	130 43 25.3	19.92	5.4	1
453	B. A. C. 4235	4.0	27 48.14	2.927	5.3	3	47 57 47.1	19.91	5.3	3
454	Weisse 498	. .	31 7.19	3.081	6.0	1	92 52 52.3	19.87	6.0	1
455	B. A. C. 4296	6.0	41 29.55	3.054	5.3	3	85 44 40.6	19.72	5.3	3
456	B. A. C. 4315	5.3	12 45 36.51	+ 2.931	5.3	3	61 46 42.9	+ 19.66	5.3	3
457	B. A. C. 4321	4.6	46 31.33	3.294	5.3	3	129 29 57.7	19.64	5.3	3
458	32^1 Camelopardalis	. .	48 5.92	0.378	5.4	4	5 54 10.0	19.62	5.4	5
459	32^1 Camelopardalis, S. P.	. .	48 5.57	0.378	5.8	7	5 54 7.8	19.62	5.8	6
460	B. A. C. 4340	. .	49 18.45	3.052	5.8	5	85 55 21.1	19 59	5.8	3
461	12^1 Canum Venaticorum	. .	12 50 9.34	+ 2.837	5.1	1	51 0 35.8	+ 19.58	5.1	1
462	B. A. C. 4351	4.0	52 44.55	2.973	5.3	2	71 54 58 5	19.53	5.3	2
463	B. A. C. 4355	. .	53 42.53	3.273	5.4	1	122 49 41.0	19.51	5.4	1
464	B. A. C. 4367	4.0	55 57.22	3.006	5.7	10	78 22 7.0	19.46	5.7	10
465	B. A. C. 4374	6.0	57 46.16	3.357	5.3	4	130 31 30.0	19.42	5.3	4

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			h. m. s.	s.			° ′ ″	″		
466	B. A. C. 4390 . . .	4.0	13 1 10.75	+ 2.882	5.3	4	61 42 14.4	+ 19.34	5.3	4
467	Lacaille 5410 . . .	7.6	2 6.03	3.303	5.3	3	122 50 2.3	19.32	5.3	3
468	B. A. C. 4433 . . .	5.0	8 2.70	2.735	5.3	3	49 11 7.4	19.18	5.3	3
469	B. A. C. 4462 . . .	7.0	14 15.00	3.031	5.4	3	84 30 59.0	19.01	5.4	3
470	B. A. C. 4467 . . .	. .	14 42.67	2.703	5.4	3	49 11 35.4	19.00	5.4	3
471	B. A. C. 4518 . . .	7.0	13 25 44.69	+ 3.472	5.3	3	129 19 40.1	+ 18.67	5.3	3
472	B. A. C. 4522 . . .	6.0	26 31.17	3.476	5.3	3	129 18 13.3	18.64	5.3	3
473	B. A. C. 4566 . . .	5.5	35 7.53	2.842	5.3	3	66 52 13.8	18.35	5.3	3
474	B. A. C. 4575 . . .	6.5	37 50.76	2.834	5.3	2	66 40 6.6	18.25	5.3	3
475	B. A. C. 4601 . . .	4.0	42 0.95	3.574	5.3	2	131 3 51.9	18.10	5.3	2
476	B. A. C. 4624 . . .	. .	13 44 51.06	+ 3.427	5.4	1	120 59 55.8	+ 17.99	5.4	1
477	B. A. C. 4629¹ . . .	8.5	46 1.14	3.435	5.1	1	121 18 51.2	17.95	5.1	1
478	B. A. C. 4629² . . .	4.5	46 1.21	3.435	5.3	3	121 18 35.2	17.95	5.3	3
479	B. A. C. 4674 . . .	6.0	55 46.66	3.462	5.4	2	121 4 56.4	17.55	5.4	2
480	B. A. C. 4681 . . .	6.0	58 25.34	3.638	5.5	2	130 34 48.3	17.44	5.5	2
481	B. A. C. 4759 . . .	. .	14 15 20.56	+ 3.674	5.4	2	128 56 23.6	+ 16.66	5.4	2
482	Anonymous* . . .	. .	22 40.59	3.361	5.4	1	110 19 45.4	16.29	5.4	1
483	B. A. C. 4812 . . .	. .	27 2.87	2.428	5.9	1	51 8 40.2	16 07	5.9	1
484	B. A. C. 4813 . . .	. .	27 37.69	3.769	5.1	1	130 58 7.4	16.04	5.1	1
485	α¹ Libræ	. .	43 46.53	3.315	5.1	1	105 28 27.3	15.15	5.1	1
486	B. A. C. 4954 . . .	. .	14 57 12.13	+ 3.872	5.4	3	130 34 39.8	+ 14.35	5.4	3
487	B. A. C. 4996 . . .	. .	15 5 15.04	3.765	5.4	3	125 37 7.2	13.85	5.4	3
488	B. A. C. 5017 . . .	. .	7 51.05	3.923	5.5	2	131 1 32.4	13.68	5.5	2
489	B. A. C. 5046 . . .	. .	13 10.43	3.916	5.5	1	130 11 38.6	13.34	5.5	1
490	B. A. C. 5054 . . .	. .	13 52.84	3.794	5.5	1	125 48 22.2	13.30	5.5	1
491	B. A. C. 5065 . . .	. .	15 16 35.44	+ 3.898	5.5	1	129 15 28.9	+ 13.12	5.5	1
492	B. A. C. 5069 . . .	. .	17 14.23	3.872	5.5	1	128 17 20.6	13.08	5.5	1
493	B. A. C. 5118 . . .	4.0	26 49.05	3.976	5.4	2	130 44 40.9	12.43	5.5	3
494	B. A. C. 5160 . . .	. .	31 49.88	3.792	5.4	2	124 0 7.7	12.08	5.4	2
495	B. A. C. 5199 . . .	. .	38 45.47	3.816	5.4	1	124 17 23.2	11.59	5.4	1
496	B. A. C. 5216 . . .	. .	15 40 25.23	+ 2.762	5.8	2	74 11 8.8	+ 11.47	5.8	2
497	B. A. C. 5230 . . .	. .	43 5.92	3.131	5.4	1	93 2 48.0	11.28	5.4	1
498	B. A. C. 5261 . . .	. .	47 41.45	3.738	5.4	1	120 42 53.6	10.94	5.4	1
499	Lalande 28969 . . .	. .	48 37.99	2.895	5.5	1	81 3 0.7	10.87	5.5	1
500	Lalande 28975 . . .	. .	48 47.43	2.895	5.5	1	81 2 47.1	10.87	5.5	1
501	B. A. C. 5284 . . .	. .	15 50 40.80	+ 2.747	5.8	3	73 55 45.7	+ 10.72	5.8	3
502	Weisse 983	. .	52 53.29	2.893	5.5	1	81 4 40.3	10.56	5.5	1
503	Lalande 29122 . . .	. .	54 4.86	2.892	5.5	1	81 1 25.5	10.47	5.5	1
504	β² Scorpii	. .	58 10.80	3.479	5.2	1	109 27 29.4	10.16	5.2	1
505	Lalande 29319 . . .	. .	58 43.61	2.203	5 4	3	53 1 21.3	10.13	5.4	3

* Faint; observed for Pandora.

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			h. m. s.	s.			° ′ ″	″		
506	Lalande 29334	. .	16 0 9.26	+ 2.890	5.5	1	81 3 57.3	+ 10.01	5.5	1
507	Lalande 29403	. .	1 18.26	2.199	5.4	3	53 3 41.9	9.93	5.4	3
508	B. A. C. 5355[1]	. .	1 34.58	3.808	5.5	1	122 18 52.9	9.91	5.5	1
509	B. A. C. 5355[2]	. .	1 35.21	3.808	5.5	1	122 18 53.2	9.91	5.5	1
510	Lalande 29433	. .	1 54.66	2.198	5.4	3	53 5 3.0	9.88	5.4	3
511	Lalande 29417	. .	16 2 26.58	+ 2.890	5.5	1	81 8±	. .	. .	.
512	Lalande 29423	. .	2 35.30	2.888	5.5	1	81 3 10.7	+ 9.83	5.5	1
513	Lalande 29638	. .	8 28.40	2.184	5.4	2	53 2 40.8	9.38	5.4	2
514	Lalande 29685	. .	10 15.04	2.178	5.4	3	52 59 48.0	9.24	5.4	3
515	Lalande 29708	. .	11 18.08	2.180	5.4	3	53 8 1.7	9.16	5.4	3
516	B. A. C. 5437	. .	16 11 42.56	+ 3.164	5.7	2	94 23 12.2	+ 9.13	5.7	2
517	σ Scorpii	. .	13 35.60	3.637	5.6	2	115 17 28.0	8.98	5.6	2
518	B. A. C. 5466	. .	16 24.34	2.648	5.6	1	70 33 8.3	8.76	5.6	1
519	B. A. C. 5525	. .	24 50.76	2.584	5.6	1	68 14 13.4	8.09	5.6	1
520	B. A. C. 5587	7.0	35 2.14	2.793	5.5	1	77 21 39.0	7.27	5.5	1
521	B. A. C. 5583	. .	16 35 5.47	+ 4.152	5.4	1	130 52 44.0	+ 7.25	5.4	1
522	B. A. C. 5584	. .	35 13.65	4.152	5.4	1	130 52 19.6	7.25	5.4	1
523	B. A. C. 5596	. .	35 21.43	1.629	5.6	1	40 49 32.2	7.24	5.6	1
524	XVI, 16	. .	35 23.74	3.686	5.5	1	116 13 4.3	7.24	5.5	1
525	XVI, 15	. .	36 10.30	3.589	5.5	1	112 29 52.8	7.17	5.5	1
526	B. A. C. 5604	. .	16 36 34.15	+ 2.302	5.2	1	58 20 11.5	+ 7.14	5.2	1
527	XVI, 19	. .	39 35.41	3.526	5.4	1	109 52 13.4	6.89	5.4	1
528	B. A. C. 5620	. .	39 42.93	2.713	5.5	1	74 1 21.9	6.88	5.5	1
529	B. A. C. 5628	. .	40 3.52	0.398	5.6	1	25 10 26.9	6.85	5.6	1
530	B. A. C. 5629	. .	40 25.15	1.214	5.6	3	34 4 45.9	6.83	5.6	2
531	XVI, 21	. .	16 40 38.14	+ 3.640	5.5	1	114 18 4.6	+ 6.81	5.5	1
532	B. A. C. 5717	6.0	52 19.87	0.805	5.4	1	29 26 14.5	5.84	5.4	1
533	B. A. C. 5740	. .	55 20.84	0.276	5.4	1	24 40 28.0	5.59	5.4	1
534	B. A. C. 5731	. .	55 30.44	2.297	5.8	5	58 53 18.6	5.57	5.8	5
535	B. A. C. 5745	6.5	55 48.28	0.287	5.4	1	24 46 15.9	5.54	5.4	1
536	B. A. C. 5752	5.5	16 57 4.11	+ 1.101	5.4	2	33 7 40.0	+ 5.44	5.4	2
537	Anonymous	10.5	57 37.84	3.640	5.5	1	113 48 11.4	5.38	5.5	1
538	Anonymous	10.5	57 48.87	3.640	5.5	1	113 48 10.0	5.38	5.5	1
539	B. A. C. 5753	. .	57 54.67	2.756	5.4	1	76 12 56.8	5.37	5.4	1
540	B. A. C. 5757	. .	58 12.97	2.758	5.4	1	76 15 4.3	5.34	5.4	1
541	Mural Zones 174, 65	. .	17 0 36.58	+ 3.634	5.5	2	113 30 16.3	+ 5.14	5.5	1
542	Mural Zones 174, 66	. .	0 51.09	3.633	5.5	2	113 25 37.6	5.11	5.5	1
543	B. A. C. 5781	. .	3 12.66	3.433	5.7	1	105 34 5.3	4.92	5.7	1
544	B. A. C. 5793	. .	4 51.18	3.893	5.6	1	122 17 6.5	4.78	5.6	1
545	Anonymous	. .	5 4.26	3.637	5.5	2	113 28 34.6	4.76	5.5	1

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			h. m. s.	s.			° ′ ″	″		
546	Anonymous	. .	17 6 3.14	+ 3.634	5.5	1	113 20 59.3	+ 4.67	5.5	1
547	B. A. C. 5834	. .	10 41.59	2.090	5.8	3	53 2 56.8	4.28	5.8	3
548	Anonymous	. .	11 33.39	3.639	5.5	2	113 24 8.9	4.20	5.5	2
549	Anonymous	. .	11 38.63	3.639	5.5	2	113 27 54.3	4.20	5.5	2
550	XVII, 2	. .	13 30.84	3.575	5.6	2	110 58 37.3	4.04	5.6	2
551	Mural Zones 171, 9	9.0	17 14 30.86	+ 3.641	5.6	3	113 26 52.8	+ 3.96	5.6	3
552	Anonymous	. .	15.6	. .	. .	.	113 6 *	3.86	5.5	2
553	XVII, 4	. .	15 50.63	3.980	5.7	1	124 40 17.4	3.84	5.7	1
554	B. A. C. 5863	. .	15 59.19	2.232	5.6	1	57 22 15.1	3.83	5.6	1
555	XVII, 3	. .	16 7.42	3.592	5.6	1	111 35 36.9	3.82	5.6	1
556	B. A. C. 5871	. .	17 16 49.24	+ 1.695	5.6	3	43 38 8.4	+ 3.76	5.6	3
557	XVII, 5	. .	18 15.82	3.756	5.4	1	117 29 0.0	3.63	5.4	1
558	XVII, 7	7.0	23 32.98	3.949	5.5	1	123 36 14.3	3.18	5.5	1
559	XVII, 8	. .	23 47.40	3.657	5.5	3	113 51 50.2	3.15	5.5	3
560	B. A. C. 5917	. .	24 4.32	0.771	5.7	2	29 50 46.7	3.13	5.7	2
561	B. A. C. 5918	. .	17 24 12.45	+ 0.896	5.7	2	31 14 35.9	+ 3.12	5.7	2
562	B. A. C. 5929	. .	26 29.71	2.001	5.6	1	51 1 24.1	2.92	5.6	1
563	B. A. C. 5950	. .	29 42.94	1.161	5.6	2	34 43 †	2.64	5.6	2
564	XVII, 10	8.0	29 47.62	3.863	5.5	1	120 49 48.2	2.64	5.5	1
565	B. A. C. 5951	. .	29 48.22	1.161	5.6	2	34 44 †	2.64	5.6	2
566	B. A. C. 5962	7.0	17 31 51.28	+ 2.280	5.6	3	59 8 12.3	+ 2.45	5.6	3
567	B. A. C. 5967	. .	32 22.08	2.471	5.7	2	65 36 51.8	2.41	5.7	2
568	B. A. C. 5975	. .	33 21.48	1.563	5.6	3	41 20 26.8	2.32	5.6	3
569	B. A. C. 5974	. .	34 21.94	4.069	5.7	1	126 52 49.9	2.24	5.7	1
570	B. A. C. 5990	. .	35 56.31	1.692	5.6	2	43 55 34.5	2.10	5.6	2
571	B. A. C. 5988	. .	17 35 57.32	+ 2.464	5.6	2	65 25 25.9	+ 2.10	5.6	3
572	O. Arg. S. 17123	. .	36 23.69	3.762	5.6	1	117 23 53.0	2.06	5.6	1
573	Transit Zones 36, 67	. .	37 16.88	3.762	5.6	1	117 24 12.4	1.98	5.6	1
574	B. A. C. 5996	. .	37 17.94	2.964	5.8	4	85 22 44.3	1.98	5.8	4
575	O. Arg. S. 17177	. .	38 40.42	3.762	5.6	1	117 23 9.9	1.86	5.6	1
576	XVII, 16	. .	17 40 3.90	+ 3.578	5.7	2	110 47 14.5	+ 1.74	5.7	2
577	XVII, 15	. .	40 6.01	3.925	5.5	1	122 37 19.4	1.74	5.5	1
578	XVII, 18	. .	40.8	. .	. .	.	128 56 19.9	1.68	5.7	1
579	XVII, 19	. .	43 14.62	4.057	5.6	1	126 25 48.5	1.47	5.6	1
580	B. A. C. 6033	. .	43 44.95	2.432	5.7	2	64 20 5.1	1.43	5.7	2
581	B. A. C. 6036	. .	17 43 46.84	+ 1.609	5.7	2	42 20 36.8	+ 1.42	5.7	2
582	XVII, 21	. .	44 32.02	3.975	5.5	2	124 4 50.9	1.36	5.5	2
583	O. Arg. N. 17522	. .	44 37.90	1.610	5.7	1	42 22 23.4	1.35	5.7	1
584	B. A. C. 6052	. .	46 5.30	1.435	5.6	1	39 11 18.3	1.22	5.6	1
585	Mural Zones 27, 50	. .	50 43.21	3.805	5.7	1	118 44 33.7	0.81	5.7	1

*Mean not taken, see page 419.

† Mean not taken, see page 420.

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1875.0.	Annual Precession.	Mean year.	No. of obs.	Mean N. P. Distance, 1875.0.	Annual Precession.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
586	B. A. C. 6082 . . .	. .	17 51 57.99	+ 2.056	5.6	7	52 43 54.8	+ 0.70	5.6	7
587	B. A. C. 6103 . . .	5.0	56 25.38	4.040	5.7	1	125 54 6.7	+ 0.31	5.7	1
588	B. A. C. 6162 . . .	. .	18 3 42.80	1.806	5.6	5	46 33 12.3	− 0.32	5.6	5
589	XVIII, 2	9.0	4 45.26	3.874	5.6	2	120 58 28.5	0.42	5.6	2
590	XVIII, 3	6.5	4 51.60	3.545	5.7	3	109 27 32.2	0.43	5.7	4
591	XVIII, 4	8.0	18 5.9	+ . .	. .	.	119 33 55.2	− 0.52	5.7	1
592	XVIII, 5	4.0	6 17.31	3.588	5.7	3	111 5 21.2	0.55	5.7	4
593	B. A. C. 6178 . . .	. .	7 11.72	2.257	5.7	1	58 37 28.2	0.63	5.7	1
594	XVIII, 6	. .	9 28.49	3.804	5.7	1	118 41 33.3	0.83	5.7	1
595	XVIII, 7	. .	10 8.32	4.089	5.7	1	127 16 5.1	0.88	5.7	1
596	B. A. C. 6203 . . .	. .	18 11 45.38	+ 1.865	5.7	2	47 52 57.1	− 1.03	5.7	2
597	XVIII, 9	. .	12 18.92	3.649	5.7	2	113 21 50.4	1.08	5.7	2
598	B. A. C. 6218 . . .	4.0	13 8.84	1.917	5.7	3	49 6 42.3	1.15	5.7	3
599	Weisse (2) 395 . . .	9.0	15 7.22	2.564	5.7	5	69 8 5.8	1.32	5.7	3
600	B. A. C. 6235 . . .	6.0	15 28.85	2.102	5.7	3	53 59 26.1	1.36	5.7	3
601	Weisse (2) 415 . . .	6.0	18 15 45.61	+ 2.564	5.7	4	69 7 17.6	− 1.38	5.7	4
602	B. A. C. 6246 . . .	. .	17 0.50	1.408	5.7	2	38 42 23.3	1.49	5.8	3
603	B. A. C. 6245 . . .	5.5	17 17.61	2.645	5.7	3	72 14 6.3	1.51	5.7	3
604	Weisse (2) 475 . . .	. .	17 36.06	2.563	5.7	2	69 5 52.7	1.54	5.7	2
605	B. A. C. 6298[1] . . .	. .	24 45.77	4.141	5.7	1	128 48 28.9	2.17	5.7	1
606	B. A. C. 6298[2] . . .	. .	18 24 45.99	+ 4.141	5.7	1	128 48 51.5	− 2.17	5.7	1
607	O. Arg. S. 18436 . .	. .	29 7.19	3.772	5.7	1	117 49 46.7	2.54	5.7	1
608	XVIII, 15	. .	30 9.36	3.926	5.6	4	122 47 6.4	2.64	5.6	3
609	B. A. C. 6350 . . .	. .	31 6.56	1.361	5.7	3	37 44 42.3	2.71	5.7	3
610	B. A. C. 6349 . . .	. .	31 10.57	2.007	5.6	3	51 12 22.4	2.72	5.6	3
611	XVIII, 16	7.0	18 32 58.78	+ 3.856	5.7	2	120 38 24.8	− 2.88	5.7	2
612	XVIII, 17	. .	33 55.64	3.692	5.7	2	115 6 7.7	2.96	5.7	2
613	B. A. C. 6365 . . .	. .	35 57.97	2.031	5.6	3	51 44 54.2	3.14	5.6	3
614	B. A. C. 6368 . . .	. .	36 4.92	1.177	5.7	3	34 52 11.3	3.15	5.7	3
615	XVIII, 18	. .	36 33.18	3.881	5.7	1	121 31 23.8	3.19	5.7	1
616	XVIII, 19	6.4	18 38 38.31	+ 3.545	5.7	3	109 44 5.3	− 3.36	5.7	3
617	XVIII, 20	. .	38 48.34	3.619	5.7	3	112 31 15.0	3.38	5.7	3
618	XVIII, 21	7.5	39 44.41	3.785	5.7	3	118 24 40.9	3.46	5.7	3
619	B. A. C. 6395 . . .	. .	40 12.62	1.162	5.6	3	34 35 11.1	3.50	5.6	3
620	XVIII, 22	6.5	40 58.63	3.989	5.7	3	124 52 54.0	3.57	5.7	3
621	B. A. C. 6397 . . .	. .	18 41 30.05	+ 2.644	5.7	3	71 57 23.0	− 3.61	5.7	3
622	B. A. C. 6404 . . .	. .	42 13.33	1.917	5.7	2	48 41 29.0	3.67	5.7	2
623	B. A. C. 6426 . . .	. .	45 6.83	2.232	5.7	3	57 19 49.3	3.92	5.7	3
624	B. A. C. 6427 . . .	. .	45 12.90	2.240	5.8	3	57 35 31.4	3.93	5.8	3
625	XVIII, 23	. .	46 31.89	3.589	5.8	2	111 30 38.9	4.04	5.8	2

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1875.0.	Annual Precession.	Mean year.	No. of obs.	Mean N. P. Distance, 1875.0.	Annual Precession.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
626	B. A. C. 6438 . . .	. .	18 46 56.10	+ 2.562	5.7	4	68 43 26.9	− 4.08	5.7	4
627	Anonymous . . .	. .	49 1.00	3.797	5.7	1	119 1 15.3	4.26	5.7	1
628	B. A. C. 6487 . . .	. .	53 56.96	2.726	5.7	1	75 6 1.3	4.67	5.7	2
629	B. A. C. 6491 . . .	. .	54 16.04	2.244	5.1	2	57 28 52.1	4.71	5.1	2
630	B. A. C. 6489 . . .	. .	54 39.20	3.824	5.6	1	120 3 24.9	4.74	5.6	1
631	B. A. C. 6523 . . .	. .	18 59 38.59	+ 4.183	5.7	1	130 41 17.6	− 5.16	5.7	1
632	XIX, 3	8.5	19 11 34.45	3.785	5.6	1	119 14 46.9	6.16	5.6	1
633	B. A. C. 6601 . . .	. .	11 41.13	1.077	5.7	3	32 30 36.4	6.17	5.7	3
634	B. A. C. 6599 . . .	. .	12 1.80	2.082	5.6	2	52 5 18.4	6.20	5.6	2
635	B. A. C. 6594 . . .	6.0	12 23.68	3.868	5.7	3	122 2 45.1	6.23	5.7	4
636	B. A. C. 6622 . . .	5.0	19 15 13.19	+ 4.167	5.7	3	130 50 54.6	− 6.46	5.7	3
637	B. A. C. 6659 . . .	. .	20 7.18	1.574	5.6	1	39 58 22.4	6.87	5.6	1
638	B. A. C. 6680 . . .	7.0	24 31.06	3.825	5.7	4	121 7 50.2	7.23	5.7	4
639	B. A. C. 6684 . . .	7.0	25 7.88	3.810	5.7	2	120 37 32.7	7.28	5.7	2
640	B. A. C. 6690 . . .	. .	25 40.80	2.419	5.4	5	62 18 5.8	7.32	5.4	5
641	B. A. C. 6693 . . .	. .	19 27 5.80	+ 3.845	5.7	1	121 52 36.4	− 7.44	5.7	1
642	Anonymous . . .	9.0	27 48.71	3.695	5.7	4	116 40 11.5	7.50	5.7	4
643	Mural Zones 176, 77 .	. .	28 12.87	3.692	5.7	5	116 34 22.7	7.53	5.7	4
644	Mural Zones 176, 78 .	. .	28 51.38	3.692	5.7	5	116 35 41.4	7.59	5.7	5
645	Anonymous . . .	. .	30 25.69	3.693	5.7	1	116 42 31.5*	7.71	5.7	1
646	B. A. C. 6718 . . .	. .	19 30 36.66	+ 1.956	5.6	2	47 51 38.0	− 7.72	5.6	2
647	Mural Zones 119, 60 .	9.0	30 39.16	3.718	5.7	2	117 38 16.8	7.72	5.7	2
648	Anonymous . . .	. .	30 45.15	3.691	5.7	1	116 38 36.2	7.74	5.7	1
649	B. A. C. 6721 . . .	. .	31 6.62	1.708	5.7	2	42 6 27.7	7.76	5.7	2
650	O. Arg. S. 19809 . .	8.5	31 12.60	3.718	5.7	2	117 39 6.3	7.77	5.7	2
651	XIX, 10	. .	19 31 34.84	+ 3.864	5.6	1	122 45 17.4	− 7.80	5.6	1
652	B. A. C. 6724 . . .	. .	31 37.89	2.715	5.6	2	73 49 0.3	7.80	5.6	2
653	Anonymous . . .	9.0	32 12.86	3.864	5.6	1	122 45 38.4	7.85	5.6	1
654	B. A. C. 6731 . . .	. .	32 45.59	1.868	5.6	1	45 34 52.6	7.90	5.6	1
655	B. A. C. 6753 . . .	. .	37 29.27	3.810	5.7	1	121 12 3.4	8.28	5.7	1
656	B. A. C. 6762 . . .	. .	19 38 48.70	+ 2.458	5.6	2	63 9 45.7	− 8.38	5.6	2
657	XIX, 12	. .	40 5.27	3.565	5.7	3	112 7 57.1	8.48	5.7	3
658	B. A. C. 6780 . . .	. .	40 48.27	1.158	5.6	1	32 16 52.7	8.54	5.6	1
659	B. A. C. 6784 . . .	. .	41 40.76	2.274	5.7	2	56 33 45.0	8.61	5.7	2
660	B. A. C. 6790 . . .	. .	43 21.01	4.089	5.7	1	130 11 20.5	8.74	5.7	1
661	B. A. C. 6794 . . .	. .	19 43 25.73	+ 2.662	5.7	3	71 10 13.4	− 8.74	5.7	3
662	XIX, 13	8.8	43 35.58	4.036	5.6	3	128 43 4.6	8.76	5.6	3
663	B. A. C. 6806 . . .	. .	45 2.24	2.122	5.6	1	51 36 13.7	8.87	5.6	1
664	B. A. C. 6817 . . .	4.0	46 19.90	2.059	5.7	4	49 43 2.2	8.97	5.7	4
665	XIX, 14	5.0	46 48.49	3.610	5.6	1	114 14 59.6	9.01	5.6	1

* Micrometer revolutions are uncertain.

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1875.0.	Annual Precession.	Mean year.	No. of obs.	Mean N. P. Distance, 1875.0.	Annual Precession.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
666	B. A. C. 6827 . . .	. .	19 48 8.83	+ 2.548	5.7	3	66 14 44.3	− 9.11	5.7	3
667	XIX, 15	6.5	49 16.55	3.691	5.7	5	117 29 58.0	9.20	5.7	5
668	B. A. C. 6839 . . .	5.5	50 20.53	2.726	5.7	3	73 41 42.3	9.28	5.7	3
669	XIX, 16	. .	51 4.44	3.779	5.7	5	120 52 16.7	9.35	5.7	5
670	B. A. C. 6849 . . .	. .	51 23.74	2.144	7.7	3	51 50 41.5	9.37	5.7	3
671	B. A. C. 6851 . . .	. .	19 51 36.90	2.253	5.8	3	55 14 51.8	− 9.38	5.8	3
672	XIX, 17	. .	51 44.25	3.900	5.8	3	125 1 56.6	9.39	5.8	3
673	B. A. C. 6863 . . .	. .	52 53.11	2.083	5.8	3	32 4 47.4	9.48	5.8	4
674	B. A. C. 6857 . . .	6.0	52 53.39	1.193	5.7	3	49 58 2.3	9.48	5.7	3
675	B. A. C. 6860 . . .	. .	53 0.40	2.148	5.7	4	51 52 38.9	9.49	5.7	4
676	Bonn VI, + 38°, 3836 .	. .	19 53 10.51	+ 2.151	5.7	2	51 56 4.7	− 9.51	5.7	2
677	B. A. C. 6879 . . .	. .	55 57.22	2.466	5.6	2	62 35 27.0	9.72	5.6	1
678	B. A. C. 6877 . . .	. .	56 23.78	3.814	5.7	2	122 24 18.3	9.75	5.7	2
679	B. A. C. 6882 . . .	. .	56 26.87	2.541	5.6	3	65 32 44.0	9.75	5.6	3
680	B. A. C. 6886 . . .	6.5	57 33.61	3.839	5.7	3	123 21 7.2	9.84	5.7	3
681	B. A. C. 6895 . . .	. .	19 57 49.26	+ 1.697	5.6	2	40 14 33.1	− 9.86	5.6	2
682	B. A. C. 6922 . . .	. .	20 2 58.96	3.920	5.7	4	126 24 49.6	10.25	5.7	4
683	B. A. C. 6934 . . .	. .	4 51.37	3.096	5.5	4	91 11 26.8	10.40	5.6	5
684	B. A. C. 6948 . . .	. .	8 4.56	3.737	5.7	3	120 23 4.3	10.63	5.7	3
685	B. A. C. 6983 . . .	. .	10 51.08	1.852	5.6	1	42 40 21.1	10.84	5.6	1
686	B. A. C. 6977 . . .	. .	20 11 39.82	+ 3.721	5.7	3	120 0 43.2	− 10.90	5.7	3
687	XX, 5	. .	12 13.72	3.856	5.7	2	124 58 24.6	10.94	5.7	2
688	B. A. C. 6986 . . .	. .	12 28.34	2.134	5.6	2	50 1 15.6	10.96	5.6	2
689	B. A. C. 6990 . . .	. .	13 10.92	2.210	5.6	1	52 21 17.0	11.01	5.6	1
690	B. A. C. 6998 . . .	. .	13 50.92	2.303	5.7	4	55 24 25.5	11.05	5.7	4
691	B. A. C. 7001 . . .	. .	20 14 24.53	+ 2.183	5.6	1	51 23 12.2	− 11.10	5.6	1
692	Weisse (2) 538 . . .	. .	15 53.51	2.684	5.7	1	70 41 28.1	11.21	5.7	1
693	B. A. C. 7022 . . .	. .	17 44.52	2.152	5.3	12	50 8 33.6	11.34	5.3	12
694	B. A. C. 7025 . . .	7.0	18 46.81	3.925	5.7	3	127 48 18.7	11.42	5.7	3
695	B. A. C. 7036 . . .	6.5	20 45.29	3.866	5.7	3	126 0 21.7	11.56	5.7	3
696	O. Arg. S. 20578 . .	. .	20 24 52.42	+ 3.582	5.7	3	115 17 27.8	− 11.85	5.7	3
697	B. A. C. 7077 . . .	. .	25 25.77	3.583	5.6	3	115 21 51.4	11.89	5.6	3
698	Anonymous . . .	. .	25 41.86	3.583	5.6	3	115 24 46.0	11.91	5.6	3
699	O. Arg. S. 20601 . .	. .	26 24.63	3.575	5.7	3	115 5 0.8	11.96	5.7	3
700	Anonymous . . .	. .	26 45.74	3.583	5.6	2	115 27 56.2	11.98	5.6	2
701	Anonymous . . .	. .	20 27 21.12	+ 3.581	5.6	2	115 25 31.2	− 12.03	5.6	1
702	Mural Zones 64, 16 .	. .	28 24.62	3.565	5.7	3	114 48 9.9	12.10	5.7	3
703	B. A. C. 7149 . . .	5.0	33 49.93	2.783	5.5	4	74 31 39.7	12.47	5.5	4
704	B. A. C. 7155 . . .	. .	34 41.53	3.948	5.7	3	130 0 13.9	12.53	5.7	3
705	B. A. C. 7175 . . .	. .	38 10.95	3.926	5.7	3	129 39 4.4	12.77	5.7	3

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1875.0.	Annual Precession.	Mean year.	No. of obs.	Mean N. P. Distance, 1875.0.	Annual Precession.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
706	B. A. C. 7204 . . .	3.0	20 41 9.20	+ 2.397	5.7	4	56 29 49.6	− 12.97	5.7	3
707	B. A. C. 7215 . . .	. .	42 14.89	1.500	5.7	3	32 52 6.2	13.04	5.7	3
708	B. A. C. 7213 . . .	. .	42 32.52	2.334	5.6	1	53 58 4.7	13.06	5.6	1
709	B. A. C. 7218 . . .	. .	42 43.75	1.749	5.7	3	37 27 32.0	13.07	5.7	3
710	B. A. C. 7212 . . .	6.5	42 58.70	3.874	5.8	3	128 22 36.2	13.09	5.8	3
711	XX, 15	. .	20 43 46.99	+ 3.566	5.7	2	116 2 51.3	− 13.14	5.7	2
712	XX, 16	. .	44 5.03	3.619	5.6	1	118 27 39.8	13.16	5.6	1
713	B. A. C. 7226 . . .	. .	44 12.68	3.743	5.8	3	123 38 39.6	13.17	5.8	3
714	XX, 17	. .	44 35.60	3.681	5.7	1	121 9 49.0	13.20	5.7	1
715	B. A. C. 7234 . . .	6.6	45 31.78	3.922	5.8	3	130 16 34.7	13.26	5.8	3
716	B. A. C. 7241 . . .	. .	20 45 38.64	+ 2.118	5.6	1	46 24 38.9	− 13.26	5.6	1
717	B. A. C. 7237 . . .	. .	45 41.19	3.524	5.7	3	114 15 0.8	13.27	5.7	3
718	Mural Zones 40, 29 .	. .	45 46.52	3.679	5.7	2	121 11 19.0	13.28	5.7	1
719	B. A. C. 7280 . . .	6.0	53 37.20	3.697	5.7	3	122 44 41.5	13.78	5.7	3
720	B. A. C. 7286 . . .	5.0	54 25.85	3.857	5.7	3	129 0 51.9	13.83	5.7	3
721	B. A. C. 7292 . . .	5.0	20 54 58.42	+ 3.858	5.7	3	129 7 4.2	− 13.87	5.7	3
722	B. A. C. 7316 . . .	6.5	58 28.10	3.635	5.7	3	120 37 12.6	14.09	5.7	3
723	B. A. C. 7349 . . .	. .	21 4 11.69	3.872	5.8	3	130 46 16.7	14.44	5.8	3
724	B. A. C. 7353 . . .	5.0	5 2.78	3.846	5.7	4	129 55 58.5	14.49	5.7	4
725	Mural Zones 187, 66 .	. .	6 51.48	3.417	5.7	3	110 36 9.1	14.60	5.7	3
726	Anonymous . . .	. .	21 7 41.74	+ 3.447	5.7	2	112 20 12.6	− 14.65	5.7	3
727	O. Arg. S. 21237 . .	. .	7 51.13	3.415	5.7	3	110 35 13.4	14.66	5.7	3
728	Transit Zones 176, 4 .	. .	7 53.37	3.447	5.8	5	112 19 52.4	14.66	5.7	6
729	Transit Zones 182, 75 .	. .	8 5.79	3.437	5.7	3	111 48 40.9	14.67	5.8	4
730	O. Arg. S. 21249 . .	. .	8 43.74	3.438	5.7	3	111 57 25.9	14.71	5.8	4
731	B. A. C. 7398 . . .	4.0	21 12 30.37	+ 2.353	5.7	3	51 7 42.4	− 14.93	5.7	3
732	B. A. C. 7399 . . .	. .	12 46.74	2.463	5.8	3	55 37 37.9	14.95	5.8	3
733	B. A. C. 7447 . . .	4.0	20 9.46	3.415	5.7	3	111 44 7.9	15.37	5.7	3
734	B. A. C. 7458 . . .	6.0	21 35.43	3.600	5.7	2	121 46 54.0	15.45	5.7	3
735	B. A. C. 7475 . . .	. .	24 40.69	3.648	5.7	3	124 29 39.0	15.62	5.7	3
736	B. A. C. 7502 . . .	6.0	21 29 18.17	+ 3.615	5.7	5	123 36 21.2	− 15.87	5.7	5
737	XXI, 13	. .	31 50.16	3.368	5.8	1	110 11 10.8	16.01	5.8	1
738	XXI, 16	7.5	38 0.88	3.404	5.7	1	113 8 8.9	16.33	5.7	2
739	B. A. C. 7613 . . .	2.5	46 21.25	3.646	5.7	3	127 57 6.5	16.74	5.7	3
740	B. A. C. 7632 . . .	. .	48 51.09	3.635	5.7	3	127 50 42.0	16.86	5.7	3
741	B. A. C. 7635 . . .	. .	21 49 29.16	+ 3.642	5.7	3	128 20 22.8	− 16.89	5.7	3
742	B. A. C. 7647 . . .	5.5	51 44.05	3.647	5.7	3	128 59 29.3	16.99	5.7	3
743	B. A. C. 7673 . . .	. .	57 11.26	3.475	5.7	3	120 31 14.8	17.24	5.7	3
744	B. A. C. 7684 . . .	5.0	58 34.47	3.642	5.8	3	130 8 45.2	17.31	5.8	3
745	Anonymous . . .	. .	59 23.26	3.284	5.7	3	107 32 25.0	17.34	5.7	3

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1875.0.	Annual Precession.	Mean year.	No. of obs.	Mean N. P. Distance, 1875.0.	Annual Precession.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
746	Anonymous . . .	. .	21 59 45.82	+ 3.280	5.7	3	107 15 34.1	− 17.36	5.7	3
747	B. A. C. 7701 . . .	5.5	22 1 5.30	3.513	5.8	2	123 35 49.8	17.42	5.8	3
748	B. A. C. 7702 . . .	. .	1 6.74	3.530	5.9	3	124 39 8.2	17.42	5.9	3
749	Anonymous . . .	. .	1 18.60	3.278	5.6	2	107 17 58.6	17.42	5.6	2
750	Mural Zones 207, 63 .	. .	1 37.52	3.276	5.8	4	107 9 13.4	17.44	5.8	4
751	Anonymous . . .	. .	22 1 43.32	+ 3.277	5.7	2	107 13 21.1	− 17.44	5.7	2
752	Lacaille 9036 . . .	. .	2 37.38	3.525	5.9	3	124 37 41.9	17.48	5.9	3
753	B. A. C. 7714 . . .	. .	2 49.11	3.500	5.7	3	123 9 41.6	17.49	5.7	3
754	B. A. C. 7742 . . .	. .	5 49.21	2.896	5.6	1	74 34 29.5	17.62	5.6	1
755	B. A. C. 7749 . . .	. .	6 31.19	2.072	5.6	1	32 24 51.4	17.65	5.6	1
756	Mural Zones 207, 70 .	. .	22 10 36.18	+ 3.256	5.7	5	106 39 40.6	− 17.81	5.7	5
757	Mural Zones 207, 71 .	. .	10 41.07	3.255	5.7	4	106 36 11.6	17.82	5.7	4
758	Anonymous . . .	9.0	12 55.13	3.247	5.8	3	106 9 14.4	17.90	5.8	3
759	Lalande 43567 . . .	8.0	13 46.72	3.235	5.8	3	105 10 52.9	17.94	5.8	3
760	Lalande 43596 . . .	7.5	14 50.50	3.232	5.8	4	105 5 8.4	17.98	5.8	4
761	B. A. C. 7795 . . .	. .	22 15 12.00	+ 3.093	5.8	3	92 1 0.1	− 17.99	5.8	3
762	Transit Zones 205, 40 .	8.0	16 37.45	3.235	5.7	3	105 34 34.5	18.05	5.7	3
763	Transit Zones 204, 17 .	8.5	19 16.86	3.231	5.7	3	105 35 9.4	18.15	5.7	3
764	B. A. C. 7826 . . .	7.8	21 19.30	3.537	5.8	4	129 45 49.0	18.22	5.8	4
765	B. A. C. 7842 . . .	6.0	24 23.66	3.424	5.7	3	122 59 9.7	18.34	5.7	3
766	B. A. C. 7872 . . .	. .	22 29 33.11	+ 3.397	5.7	3	122 18 33.3	− 18.52	5.7	3
767	Weisse 604	9.0	30 8.70	3.191	5.7	3	103 1 43.2	18.53	5.7	3
768	B. A. C. 7895 . . .	. .	33 23.64	3.372	5.7	4	121 18 9.2	18.64	5.7	3
769	B. A. C. 7909 . . .	. .	35 24.77	3.351	5.8	3	120 0 9.0	18.70	5.8	3
770	B. A. C. 7923 . . .	. .	37 8.69	2.804	5.5	6	60 25 55.9	18.76	5.5	6
771	B. A. C. 7944 . . .	7.0	22 40 40.38	+ 3.438	5.6	3	128 52 41.6	− 18.87	5.6	3
772	B. A. C. 7957 . . .	6.0	43 54.03	3.436	5.7	3	129 49 8.0	18.96	5.7	3
773	B. A. C. 7966 . . .	5.0	45 34.39	3.355	5.7	3	123 32 15.8	19.01	5.7	3
774	B. A. C. 7980 . . .	4.0	48 0.93	3.195	5.7	3	106 29 7.2	19.07	5.7	3
775	B. A. C. 7987 . . .	4.0	49 1.23	3.339	5.7	3	123 12 24.6	19.10	5.7	3
776	B. A. C. 7998 . . .	. .	22 51 37.14	+ 3.360	5.8	2	126 11 16.5	− 19.17	5.8	3
777	B. A. C. 8002 . . .	. .	52 45.40	3.297	5.8	3	120 7 54.2	19.20	5.8	3
778	B. A. C. 8025 . . .	6.0	56 34.47	3.332	5.7	3	125 25 29.0	19.29	5.7	3
779	B. A. C. 8032 . . .	. .	57 42 98	2.886	5.5	5	62 35 42.8	19.32	5.5	5
780	B. A. C. 8045 . . .	7.0	59 55.73	3.358	5.7	4	129 34 4.0	19.37	5.7	4
781	Weisse 22^{1}	. .	23 3 37.00	+ 3.122	5.7	2	98 44 46.8	− 19.45	5.7	3
782	Weisse 22^{2}	. .	3 37.21	3.122	5.7	1	98 44 42.9	19.45	5.7	1
783	Weisse 103	. .	7 32.86	3.124	5.7	3	99 36 13.1	19.53	5.7	5
784	Weisse 104	. .	7 32.97	3.124	5.7	3	99 36 39.3	19.53	5.7	5
785	Weisse 109	. .	7 41.46	3.124	5.7	4	99 37 5.3	19.53	5.7	5

Number.	Name of Star.	Magnitude.	Mean Right Ascension, 1875.0.	Annual Precession.	Mean year.	No. of obs.	Mean N. P. Distance, 1875.0.	Annual Precession.	Mean year.	No. of obs.
			h. m. s.	s.			° ′ ″	″		
786	ψ^1 Aquarii	3.5	23 9 20.57	+ 3.123	5.8	3	99 46 6.9	− 19.57	5.8	3
787	B. A. C. 8102	. .	10 22.20	3.115	5.8	3	98 24 28.7	19.59	5.8	3
788	Lalande 45562	. .	10 29.51	3.112	5.8	3	97 50 40.4	19.59	5.8	3
789	B. A. C. 8113	. .	12 4.27	3.254	5.8	3	123 12 46.5	19.62	5.8	3
790	B. A. C. 8172	. .	21 17.85	3.237	5.7	4	126 13 57.0	19.77	5.7	4
791	Durch. 18°, 5165	. .	23 26 15.57	+ 3.006	5.7	1	71 17 39.8	− 19.84	5.7	1
792	B. A. C. 8201	6.0	26 15.81	3.228	5.7	4	128 30 33.4	19.84	5.7	4
793	Weisse (2) 628	. .	30 28.25	3.015	5.7	2	71 30 28.0	19.89	5.7	2
794	Anonymous	. .	41 13.77	3.082	5.7	3	95 9 24.8	19.99	5.7	3
795	Anonymous	. .	41 24.46	3.083	5.7	3	95 37 28.0	19.99	5.7	3
796	Weisse 839	. .	23 42 3.03	+ 3.082	5.8	5	95 22 40.6	− 19.99	5.8	5
797	Weisse 848	. .	42 20.13	3.082	5.7	3	95 7 50.4	19.99	5.7	3
798	B. A. C. 8309	6.2	48 5.00	3.133	5.6	3	130 59 51.4	20.03	5.6	3
799	B. A. C. 8332	6.8	53 2.30	3.096	5.7	4	120 10 51.4	20.04	5.7	4
800	B. A. C. 8343	8.0	55 16.27	3.096	5.8	4	130 50 38.1	20.05	5.8	4
801	Weisse 1114	. .	23 55 25.16	+ 3.074	5.7	3	93 43 24.6	− 20.05	5.7	4
802	B. A. C. 8348	. .	55 30.57	3.093	5.8	3	127 55 28.2	20.05	5.8	3
803	B. A. C. 8352	. .	55 55.22	3.086	5.8	4	120 25 1.0	20.05	5.8	4
804	B. A. C. 8357	. .	57 1.49	3.085	5.8	5	126 56 52.5	20.05	5.8	4

RIGHT ASCENSIONS, NORTH-POLAR DISTANCES, AND SEMI-DIAMETERS

OF THE

SUN, MOON, AND PLANETS;

DEDUCED FROM

OBSERVATIONS WITH THE TRANSIT CIRCLE

AND

COMPARED WITH THE TABLES.

1875.

RIGHT ASCENSIONS, NORTH-POLAR DISTANCES, AND SEMI-DIAMETERS

OF THE

SUN, MOON, AND PLANETS.

SUN.

Date.	Observer.	Limb.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Limb.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
1875.	.		h. m. s.	s.	m. s.	s.		° ′ ″	″	′ ″	″
Jan. 11	E.	.	19 31 26.89	+ 0.17	1 10.34	− 0.10	.	111 47 38.9	+ 0.4	16 18.0	− 0.1
14	Sk.	.	19 44 24.74	0.00	1 10.10	− 0.09	.	111 17 22.8	+ 0.2	17.5	− 0.5
15	E.	.	19 48 42.70	− 0.04	1 10.05	− 0.05	.	111 6 27.6	− 0.4	18.8	+ 0.9
20	F.	.	20 10 2.03	+ 0.12	1 9.66	+ 0.06	.	110 6 1.4	+ 2.4	16.3	− 1.2
Feb. 1	F.	.	20 59 52.96	− 0.01	1 8.23	− 0.03	.	107 4 0.1	+ 0.8	14.8	− 1.2
5	F.	II	21 16 4.34	+ 0.04	. . .	. .	S.	105 53 12.0	+ 3.3	. .	. .
8	E.	.	21 28 4.27	0.00	1 7.36	− 0.10	.	104 57 7.1	− 0.5	15.3	+ 0.5
13	F.	.	21 47 48.19	+ 0.04	1 6.92	+ 0.02	.	103 18 49.6	− 1.4	12.8	− 1.1
15	Sk.	.	21 55 36.41	+ 0.16	1 6.63	− 0.06	.	102 38 1.3	+ 2.0	12.6	− 0.9
18	S.	.	22 7 12.83	− 0.03	1 6.38	− 0.01	.	. . . .	. .	. .	. .
22	S.	.	22 22 32.26	+ 0.20	1 6.00	0.00	.	100 9 2.5	+ 2.1	11.2	− 0.8
26	S.	.	22 37 41.50	+ 0.18	1 5.61	− 0.04	.	98 40 20.0	+ 0.6	10.9	− 0.2
Mar. 8	E.	.	23 14 58.62	− 0.10	1 4.94	− 0.03	.	94 50 31.1	+ 2.4	9.3	+ 0.7
10	F.	.	23 22 21.19	+ 0.08	1 4.86	− 0.01	.	94 3 32.8	+ 0.1	5.9	− 2.1
11	Sk.	.	23 26 1.88	+ 0.09	1 4.68	− 0.14	.	93 40 0.7	+ 0.7	6.7	− 1.1
12	E.	.	23 29 42.23	+ 0.09	1 4.73	− 0.04	.	93 16 27.0	+ 2.1	7.6	+ 0.1
16	E.	.	23 44 20.73	+ 0.11	1 4.63	+ 0.01	.	91 41 48.3	+ 0.9	7.0	+ 0.5
17	F.	.	23 47 59.70	+ 0.09	1 4.61	+ 0.02	.	91 18 8.8	+ 3.3	4.8	− 1.4
23	Sk.	.	0 9 50.14	+ 0.04	1 4.41	− 0.07	.	88 56 2.3	+ 1.7	5.2	+ 0.6
25	F.	.	0 17 6.06	− 0.10	1 4.48	+ 0.01	.	88 8 45.2	− 4.2	1.6	− 2.4
27	Sk.	.	0 24 22.20	+ 0.05	1 4.40	− 0.06	.	87 21 47.3	− 0.5	16 2.1	− 1.4
April 5	E.	.	0 57 7.73	0.00	1 4.54	− 0.05	.	83 53 25.3	+ 2.5	15 59.9	− 1.0
7	F.	.	1 4 26.14	− 0.02	1 4.68	+ 0.03	.	83 8 4.3	+ 0.5	59.9	− 0.5
20	Sk.	.	1 52 22.35	− 0.06	1 5.21	− 0.07	.	78 27 2.9	− 0.1	56.7	− 0.2
21	E.	.	1 56 6.16	− 0.01	1 5.34	0.00	.	78 6 38.4	+ 1.6	57.4	+ 0.7
22	F.	.	1 59 50.47	+ 0.11	1 5.38	− 0.03	.	. . . .	. .	. .	. .
29	E.	.	2 26 13.30	− 0.05	1 5.88	− 0.02	.	75 30 33.0	+ 1.2	54.8	+ 0.2
May 6	Sk.	.	2 53 2.66	+ 0.03	1 6.34	− 0.12	.	73 26 16.5	− 0.5	53.2	+ 0.2
7	E.	.	2 56 54.73	− 0.04	1 6.54	0.00	.	73 9 37.1	+ 1.6	53.0	+ 0.2
11	E.	.	3 12 28.86	− 0.10	1 6.90	+ 0.03	.	72 5 44.6	+ 3.6	50.8	− 1.1
13	Sk.	.	3 20 19.38	− 0.01	1 6.99	− 0.05	.	71 35 32.1	+ 0.9	50.9	− 0.7
15	E.	.	3 28 11.97	− 0.10	1 7.16	− 0.05	.	71 6 37.1	+ 1.3	50.1	− 1.1
17	F.	.	3 36 7.07	+ 0.09	1 7.37	0.00	.	70 38 57.9	+ 1.0	50.9	+ 0.1
19	E.	.	3 44 4.03	− 0.05	1 7.49	− 0.04	.	70 12 37.1	+ 0.3	50.0	− 0.4
22	Sk.	.	3 57 3.90	+ 0.05	1 7.66	− 0.10	.	69 35 37.9	− 0.5	49.4	− 0.5
26	Sk.	.	4 12 10.98	− 0.07	1 7.90	− 0.14	.	68 51 14.9	+ 1.4	49.2	0.0
27	E.	.	. . . .	. .	. . .	. .	.	68 41 4.4	+ 3.3	48.6	− 0.4
28	F.	.	4 20 17.58	− 0.15	1 8.16	− 0.01	S.	68 31 11.0	− 0.3	. .	. .
31	E.	.	4 32 31.26	− 0.05	1 8.30	− 0.05	.	68 3 55.5	+ 1.8	48.8	+ 0.4
June 1	F.	.	4 36 36.58	− 0.15	1 8.30	− 0.11	.	67 55 34.2	+ 0.7	47.2	− 1.1
4	E.	I	4 48 55.25	− 0.12	. . .	. .	N.	67 32 52.7	+ 0.7	. .	. .
11	Sk.	.	5 17 49.90	− 0.05	1 8.75	− 0.11	.	66 53 49.3	+ 2.6	46.1	− 1.1
17	F.	.	5 42 44.41	0.00	1 8.96	0.00	.	66 36 8.4	+ 2.1	46.0	− 0.7
19	Sk.	.	5 51 3.39	+ 0.08	1 8.91	− 0.07	.	66 33 32.6	+ 2.4	46.2	− 0.4
21	F.	.	5 59 22.37	+ 0.04	1 8.97	− 0.01	.	66 32 34.6	+ 1.6	45.6	− 0.8
23	Sk.	.	6 7 41.30	− 0.01	1 8.89	− 0.08	.	66 33 16.1	+ 1.1	45.9	− 0.4
25	F.	.	6 15 59.97	− 0.10	1 8.90	− 0.05	.	66 35 35.3	− 0.7	46.7	+ 0.5
29	F.	.	6 32 36.18	− 0.05	1 8.82	− 0.02	.	66 45 18.5	+ 4.6	45.1	− 1.0
July 8	E.	.	7 9 43.71	+ 0.03	1 8.46	− 0.01	.	67 30 38.2	+ 2.0	47.1	+ 0.9
19	F.	.	7 54 20.90	+ 0.03	1 7.70	− 0.03	.	69 8 29.0	− 0.4	15 46.7	0.0

SUN.

Date.	Observer.	Limb.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Limb.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
1875.			h. m. s.	s.	m. s.	s.		° ′ ″	″	′ ″	″
Aug. 5	E.	.	9 1 8.38	+ 0.04	1 6.30	0 00	.	73 1 19.6	+ 0.8	15 48.0	− 0.5
6	E.	.	9 4 58.76	+ 0.05	1 6.06	− 0.15	.	73 17 43.8	+ 0.7	47.2	− 1.5
9	P.	.	9 16 26.28	+ 0.13	1 5.92	− 0.04	.	74 8 30.9	− 0.7	48.0	− 1.2
10	Sk.	.	9 20 14.13	+ 0.02	1 5.81	− 0.06	.	74 25 59.2	+ 0.8	48.3	− 1.0
19	E.	.	9 54 0.46	+ 0.08	1 5.15	− 0.03	.	77 13 35.2	+ 2.6	50.6	− 0.4
20	P.	.	9 57 43.00	+ 0.04	1 4.93	− 0.18	.	77 33 15.1	+ 0.5	50.2	− 0.9
25	P.	.	10 16 9.32	+ 0.12	1 4.66	− 0.11	.	79 14 38.1	+ 0.6	50.5	− 0.6
26	Sk.	.	10 19 49.20	+ 0.02	1 4.65	− 0.06	.	79 35 26.5	0.0	52.3	− 0.1
30	P.	.	10 34 25.75	+ 0.12	1 4.45	− 0.05	.	81 0 22.1	+ 2.7	51.9	− 1.3
Sept. 1	P.	II	10 41 41.70	− 0.13	. . .	. .	.	81 43 41.9	+ 2.6	53.5	− 0.2
3	F.	.	. . . .	. .	. . .	. .	.	82 27 31.9	+ 0.9	53.4	− 0.8
4	P.	.	10 52 33.78	− 0.12	1 4.10	− 0.18	.	82 49 40.6	+ 2.8	53.5	− 0.9
7	F.	.	11 3 23.74	+ 0.09	1 4.25	+ 0.06	S.	83 56 38.7	− 0.5	. .	. .
8	P.	.	11 6 59.88	+ 0.08	1 4.02	− 0.15	.	84 19 13.2	+ 1.5	54.7	− 0.7
11	F.	.	11 17 47.24	+ 0.02	1 4.12	+ 0.01	.	85 27 23.4	+ 1.5	56.2	0.0
21	F.	.	11 53 40.76	+ 0.17	1 4.08	0.00	.	89 18 54.0	+ 3.7	58.7	− 0.1
24	P.	.	12 4 27.64	+ 0.06	1 4.03	− 0.10	.	90 29 2.2	+ 1.1	57.9	− 1.7
25	F.	.	12 8 3.52	− 0.03	1 4.12	− 0.03	.	90 52 26.3	+ 0.2	15 59.8	0.0
Oct. 2	E.	.	12 33 21.44	+ 0.08	1 4.41	0.00	.	93 36 4.9	+ 0.3	16 2.5	+ 0.7
5	Sk.	.	12 44 16.17	+ 0.10	1 4.48	− 0.08	.	94 45 43.4	+ 0.6	1.3	− 1.3
7	F.	.	12 51 34.41	+ 0.11	1 4.72	+ 0.05	.	95 31 48.6	− 1.9	3.3	+ 0.1
8	Sk.	.	12 55 14.02	+ 0.03	1 4.66	− 0.07	.	95 54 48.8	+ 0.9	3.4	− 0.1
9	P.	.	12 58 54.22	+ 0.12	1 4.74	− 0.06	.	96 17 40.6	0.0	2.8	− 1.0
13	Sk.	.	13 13 39.08	− 0.03	1 4.97	− 0.13	.	97 48 17.2	+ 0.1	4.2	− 0.7
20	P.	.	13 39 48.98	+ 0.18	1 5.56	− 0.13	.	100 22 27.4	+ 0.4	5.8	− 1.0
21	Sk.	.	13 43 35.79	+ 0.24	1 5.77	− 0.01	.	100 43 56.7	+ 1.5	6.3	− 0.7
25	Sk.	.	13 58 49.79	+ 0.30	1 6.15	− 0.04	.	102 8 11.3	+ 1.4	7.3	− 0.8
26	E.	.	14 2 39.78	− 0.01	1 6.32	+ 0.03	.	102 28 46.1	− 0.8	7.6	− 0.7
27	F.	.	14 6 30.86	+ 0.03	1 6.47	+ 0.07	.	102 49 12.4	0.0	7.4	− 1.2
28	P.	.	14 10 22.72	+ 0.10	1 6.38	− 0.13	.	103 9 29.1	+ 3.2	9.5	+ 0.7
29	Sk.	.	14 14 15.36	+ 0.18	1 6.47	− 0.15	.	103 29 27.7	+ 0.7	7.7	− 1.4
Nov. 2	P.	.	14 29 53.32	+ 0.10	1 6.95	− 0.12	.	104 47 20.6	+ 1.3	9.4	− 0.7
6	Sk.	.	14 45 44.18	+ 0.17	1 7.45	− 0.12	.	106 1 18.5	− 0.7	9.9	− 1.1
9	P.	.	14 57 45.72	+ 0.04	1 7.76	− 0.15	.	106 54 0.9	− 0.4	10.9	− 0.9
11	E.	.	15 5 51.10	+ 0.15	1 8.11	− 0.04	.	107 27 43.3	0.0	13.5	+ 1.2
12	P.	.	15 9 54.92	+ 0.06	1 8.16	− 0.11	.	107 44 8.9	+ 1.4	12.2	− 0.3
13	F.	.	15 13 59.92	+ 0.29	1 8.32	− 0.07	.	108 0 13.6	+ 0.4	10.7	− 2.0
17	P.	.	15 30 27.14	− 0.04	1 8.79	− 0.07	.	. . . .	. .	. .	. .
19	E.	.	15 38 46.16	+ 0.08	1 8.96	− 0.12	.	109 30 2.5	+ 3.0	11.3	− 2.6
22	Sk.	.	15 51 20.84	+ 0.13	1 9.34	− 0.07	.	110 10 13.6	+ 0.3	13.8	− 0.7
30	Sk.	.	16 25 27.31	− 0.23	1 10.22	− 0.01	.	111 40 47.7	+ 0.3	15.7	− 0.1
Dec. 2	F.	.	16 34 6.25	+ 0.02	1 10.48	+ 0.08	.	111 59 20.9	− 2.2	15.2	− 0.9
13	E.	.	17 22 16.62	− 0.17	1 11.07	− 0.04	.	. . . .	. .	. .	. .
16	P.	.	17 35 32.97	− 0.31	1 11.05	− 0.17	.	113 20 22.0	+ 2.8	17.4	− 0.4
20	P.	.	17 53 18.34	− 0.05	1 11.16	− 0.13	.	113 26 56.8	+ 1.0	17.5	− 0.5
21	E.	.	17 57 44.99	− 0.01	1 11.28	− 0.02	.	113 27 25.6	+ 1.1	17.9	− 0.2
23	Sk.	.	18 6 38.42	+ 0.02	1 11.20	− 0.10	.	113 26 57.9	+ 1.3	17.4	− 0.8
27	Sk.	.	18 24 24.70	− 0.12	1 11.23	− 0.03	.	113 20 23.4	+ 2.3	16 17.8	− 0.5

MOON.

Date.		Mean Time of Transit of Center.	Observer.	Limb.	Apparent Right Ascension of Center.	Correction to Tables of—		Limb.	Geocentric N. P. Distance of Center.	Correction to Tables of—	
						Pierce.	Hansen.			Pierce.	Hansen.
1875.		h. m. s.			h. m. s.	s.	s.		° ′ ″	″	″
Jan.	11	3 36 21.0	E.	.	. . . . . .	. .	. .	S.	99 51 28.8	− 1.9	+ 2.1
	14	5 57 38.0	Sk.	I	1 33 37.67	+ 0.19	− 0.40	S.	79 52 45.8	− 2.9	+ 4.4
	15	6 48 8.7	E.	I	2 28 13.17	+ 0.33	− 0.38	S.	73 41 2.4	− 2.8	+ 3.5
	16	7 42 25.8	F.	I	3 26 35.75	+ 0.25	− 0.58	S.	68 22 37.3	+ 0.4	+ 5.6
Feb.	13	6 34 33.8	F.	I	4 8 56.23	+ 0.17	− 0.60	S.	65 15 6.8	+ 1.1	+ 3.9
	14	7 34 13.5	S.	I	5 12 42.30	+ 0.13	− 0.69	S.	62 31 8.9	+ 0.4	+ 2.1
	16	9 35 48.9	E.	I	7 22 30.78	+ 0.38	− 0.48	N.	62 44 12.2	− 2.1	− 2.7
	17	10 33 4.7	F.	I	8 23 52.50	+ 0.02	− 0.73	N.	65 32 37.3	− 0.5	− 2.0
	22	14 22 16.7	S.	II	12 33 24.98	− 0.08	− 0.33	.	. . . . .	. .	. .
	26	17 11 24.6	S.	II	15 38 46.81	− 0.14	− 0.47	S.	112 54 34.0	− 0.6	− 2.9
	27	17 59 37.7	Sk.	II	16 31 4.45	+ 0.01	− 0.31	S.	116 1 30.1	+ 2.7	+ 1.6
Mar.	11	3 32 7.2	Sk.	I	2 48 30.02	− 0.05	− 0.48	S.	71 13 3.0	− 0.8	+ 2.6
	12	4 28 51.6	E.	I	3 49 20.37	+ 0.13	− 0.42	S.	66 17 27.7	+ 3.1	+ 5.5
	13	5 28 34.4	F.	I	4 53 9.45	+ 0.03	− 0.59	S.	62 58 43.8	− 0.9	− 0 1
	16	8 27 54.2	E.	I	8 4 48.36	− 0.44	− 0.97	N.	69 21 43.0	− 1.0	− 1.9
	17	9 21 17.3	F.	I	9 2 16.84	− 0.03	− 0.54	N.	68 6 10 9	− 1.8	− 2.7
	27	16 42 22.4	Sk.	II	17 3 59.88	− 0.05	− 0.45	S.	117 26 30.5	+ 4.2	+ 2.6
April	14	8 8 28.5	F.	I	9 39 39.57	− 0.23	− 0.63	N.	71 19 38.9	+ 0.1	− 1.5
	20	12 19 5.0	Sk.	II	14 14 36.63	− 0.37	− 0.50	S.	105 21 7.0	+ 0.8	− 2.0
	21	13 2 26.4	E.	.	. . . . . .	. .	. .	S.	110 3 15.6	+ 3.2	− 0.1
	22	13 48 22.1	F.	II	15 52 1.50	− 0.12	− 0.34	.	. . . . .	. .	. .
	24	15 28 9.6	Sk.	II	17 39 58.46	− 0.09	− 0.50	S.	118 15 58.3	+ 3.7	+ 1.1
May	7	2 3 24.0	E.	I	5 4 15.87	+ 0.04	− 0.75	.	. . . . .	. .	. .
	10	5 11 21.2	Sk.	I	8 24 33.66	− 0.27	− 0.93	N.	65 31 17.8	+ 5.2	+ 1.6
	12	6 52 30.0	F.	I	10 13 52.16	− 0.19	− 0.64	N.	74 56 28.8	− 4.2	− 8.1
	13	7 36 26.5	Sk.	I	11 1 52.41	− 0.16	− 0.48	N.	80 37 14.9	+ 0.8	− 1.8
	17	10 17 58.7	F.	I	13 59 37.41	− 0.25	− 0.37	N.	103 41 26.0	+ 0.7	− 1.1
	19	11 45 33.3	E.	I	15 35 19.46	− 0.36	− 0.46	S.	112 43 24.5	+ 4.5	+ 1.2
	22	14 16 15.7	Sk.	II	18 18 16.34	+ 0.09	− 0.32	.	. . . . .	. .	. .
	26	17 39 6.0	Sk.	II	21 57 26.14	− 0.22	− 0.82	N.	106 41 24.8	+ 0.3	+ 3.0
	27	18 25 49.2	E.	II	22 48 13.65	+ 0.04	− 0.70	.	. . . . .	. .	. .
	28	19 11 59.5	F.	II	23 38 28.05	+ 0.31	− 0.65	N.	94 30 38.4	− 2.8	+ 3.4
	30	20 47 55.3	Sk.	II	1 22 32.77	+ 0.35	− 0.92	N.	80 41 23.8	− 3.8	+ 3.9
June	11	6 56 24.1	Sk.	I	12 16 3.63	− 0.35	− 0.48	N.	90 38 48.4	+ 0.6	− 1.9
	13	8 16 42.9	F.	I	13 44 28.72	− 0.44	− 0.47	N.	102 4 4.2	− 1.0	− 2.2
	16	10 29 47.1	S.	I	16 9 44.53	− 0.36	− 0.49	N.	114 58 41.4	+ 2.5	− 0.9
	19	13 4 53.2	Sk.	II	18 57 5.76	− 0.06	− 0.39	S.	117 50 46.8	+ 4.7	+ 1.2
	23	16 23 21.7	Sk.	II	22 31 53.12	− 0.07	− 0.37	N.	102 38 55.5	+ 4.8	+ 8.7
	25	17 53 57.0	F.	II	0 10 36.33	+ 0.20	− 0.71	N.	89 55 36.9	− 1.1	+ 6.0
	27	19 29 47.4	Sk.	II	1 54 36.65	+ 0.43	− 0.89	N.	76 36 57.6	− 1.2	+ 7.0
July	8	4 52 13.4	E.	I	11 57 59.62	− 0.37	− 0.51	N.	88 29 33.1	+ 9.6	+ 4.2
	13	8 24 50.9	F.	I	15 50 54.88	− 0.45	− 0.42	N.	114 0 0.3	+ 1.3	− 0.9
	14	9 13 52.3	E.	I	16 44 0.84	− 0.31	− 0.41	N.	116 43 53.4	+ 2.1	− 0.9
	16	10 58 41.3	F.	I	18 37 0.20	− 0.17	− 0.49	S.	118 11 40.9	+ 4.3	+ 1.4
	21	15 7 27.6	Sk.	II	23 6 10.12	+ 0.02	− 0.63	.	. . . . .	. .	. .
	23	16 38 8.4	F.	II	0 44 58.93	+ 0.46	− 0.66	N.	85 1 59.8	− 2.5	+ 6.8
	25	18 16 16.1	Sk.	II	2 31 15.89	+ 0.49	− 0.95	N.	72 24 55.5	+ 0.4	+ 8.9
Aug.	5	3 27 21.0	E.	I	12 23 16.85	− 0.51	− 0.60	N.	92 9 37.4	+ 4.3	− 1.1
	9	6 18 32.7	P.	I	15 30 42.93	− 0.30	− 0.13	N.	112 50 39.8	− 3.3	+ 1.4
	10	7 6 28.0	Sk.	I	16 22 42.90	− 0.43	− 0.28	.	. . . . .	. .	. .
	20	15 23 18.7	P.	II	1 20 20.60	+ 0.52	− 0.79	.	. . . . .	. .	. .
	21	16 13 7.2	P.	II	2 14 13.76	+ 0.79	− 0.85	N.	73 57 20.0	− 3.5	+ 7.2
	25	20 8 32.5	P.	II	6 26 4.00	+ 0.30	− 1.13	S.	61 29 58.7	+ 1.0	+ 0.1
Sept.	4	3 27 9.7	P.	I	14 21 22.19	− 0.36	− 0.38	N.	106 51 59.2	− 0.4	− 4.0
	7	5 48 5.2	F.	I	16 54 30.56	− 0.31	− 0.12	N.	117 27 28.3	+ 1.8	+ 0.3
	8	6 39 41.7	P.	I	17 50 12.08	− 0.31	− 0.04	N.	118 35 30.0	+ 1.3	− 0.2
	11	9 17 6.6	F.	I	20 39 52.47	− 0.39	− 0.24	S.	113 12 2.4	+ 5.3	+ 2.6
	14	11 42 41.3	P.	I	23 17 40.79	− 0.14	− 0.29	S.	96 34 56.8	+ 2.5	+ 2.4
	24	20 56 54.8	F.	II	9 12 50.90	+ 0.05	− 0.77	S.	67 23 40.4	− 0.6	− 4.7
Oct.	5	4 30 49.2	Sk.	I	17 17 25.32	− 0.45	− 0 26	N.	118 20 47.5	+ 7.3	+ 5.7
	7	6 14 52.0	F.	I	19 19 38.36	− 0.60	− 0.43	S.	117 27 32.7	+ 3.7	+ 1.8
	8	7 6 11.9	Sk.	I	20 15 3.22	− 0.32	− 0.14	.	. . . . .	. .	. .
	12	10 18 24.8	F.	I	23 43 33.88	− 0.16	− 0.32	S.	93 6 49.6	− 24.8*	− 27.2*
	13	11 6 12.8	Sk.	I	0 35 26.35	0.00	− 0.41	S.	86 3 8.0	+ 5.3	+ 6.0
	16	13 47 26.9	P.	II	3 28 56.62	+ 0.10	− 0.98	N.	67 4 52.4	− 1.3	+ 4.3
	17	14 49 20.1	Sk.	II	4 34 56.55	+ 0.14	− 1.00	N.	63 15 29.8	+ 2.7	+ 6.3

* Probably 2 revolutions = 30″.6 in error.

MOON.

Date.		Mean Time of Transit of Center.	Observer.	Limb.	Apparent Right Ascension of Center.	Correction to Tables of—		Limb.	Geocentric N. P. Distance of Center.	Correction to Tables of—	
						Pierce.	Hansen.			Pierce.	Hansen.
1875.		h. m. s.			h. m. s.	s.	s.		° ′ ″	″	″
Oct.	19	16 57 32.2	F.	II	6 51 22.77	— 0.02	— 1.19	S.	61 47 48.0	— 0.5	— 2.1
	20	17 58 6.7	P.	II	7 56 3.75	— 0.23	— 1.42	S.	64 8 46.2	— 0.6	— 4.5
	21	18 53 47.0	Sk.	II	8 55 49.75	— 0.10	— 1.24	.	. . . .	. .	. .
	24	21 14 8.0	Sk.	II	11 28 23.49	— 0.21	— 0.82	.	. . . .	. .	. .
Nov.	2	3 15 39.5	P.	I	18 2 26.83	— 0.39	— 0.02	.	. . . .	. .	. .
	5	5 47 26.9	P.	I	20 46 28.83	— 0.33	— 0.42	S.	112 37 55.1	+ 1.6	+ 0.6
	6	6 34 59.5	Sk.	I	21 38 5.85	— 0.08	— 0.22	S.	108 9 6.3	+ 4.4	+ 3.5
	8	8 6 43.4	F.	I	23 17 57.92	— 0.21	— 0.33	S.	96 27 33.2	+ 4.9	+ 2.6
	11	10 32 30.4	E.	I	1 55 58.47	— 0.09	— 0.55	S.	75 52 10.1	+ 3.4	+ 4.2
	12	11 28 45.9	P.	I	2 56 19.85	+ 0.36	— 0.50	N.	69 45 28.1	— 0.3	+ 3.3
	14	13 36 1.8	Sk.	II	5 11 49.69	+ 0.44	— 0.89	N.	62 6 34.8	+ 0.7	+ 3.6
	17	16 47 12.5	P.	II	8 35 21.54	— 0.35	— 1.03	S.	66 38 24.4	— 11.5	— 13.4
	21	19 55 30.6	P.	II	11 59 56.76	— 0.22	— 1.00	S.	89 15 38.0	— 2.9	— 6.8
Dec.	1	2 53 29.0	E.	I	19 34 32.84	— 0.76	— 0.53	.	. . . .	. .	. .
	2	3 42 50.5	F.	I	20 27 59.01	— 0.36	— 0.25	.	. . . .	. .	. .
	10	10 7 14.8	Sk.	I	3 24 58.92	— 0.51	— 0.69	S.	67 22 36.3	+ 0.9	+ 2.5
	12	12 18 48.9	P.	I, II	5 44 48.17	+ 0.36	— 0.55	N.	61 37 46.4	— 1.5	+ 0.5
	13	13 26 58.5	E.	II	6 57 5.15	+ 0.31	— 0.85	N.	62 12 0.8	+ 0.5	— 0.2
	18	17 53 23.8	F.	II	11 43 57.02	— 0.09	— 0.60	S.	87 22 40.0	+ 1.3	— 2.8
	19	18 35 11.5	Sk.	II	12 29 48.09	— 0.19	— 0.70	S.	93 34 43.1	— 4.5	— 7.9
	20	19 16 24.0	P.	.	. . . . .	. .	. .	S.	99 29 10.0	— 3.3	— 6.6
	22	20 41 45.0	F.	II	14 48 32.10	— 0.25	— 0.75	.	. . . .	. .	. .

MERCURY.

Date.		Observer.	Part observed.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Part observed.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
1875.				h. m. s.	s.	s.	s.		° ′ ″	″	″	″
Feb.	8	E.	I	22 32 38.43	− 0.01	. .	. .	C.	99 28 23.8	+ 2.4	. .	. .
	15	Sk.	.	23 1 20.55	+ 0.09	0.28	− 0.03	.	94 45 34.1	+ 1.9	1.8	+ 1.9
	18	S.	I	23 6 26.21	+ 0.21	. .	. .	.	. . . .	. .	. .	. .
April	4	E.	II	23 22 39.55	+ 0.13	. .	. .	C.	96 31 13.6	+ 1.8	. .	. .
May	19	E.	I	4 34 42.07	− 0.39	. .	. .	.	66 18 8.1	+ 2.2	2.2	+ 0.6
	27	E.	I	5 39 22.67	− 0.31	. .	. .	.	64 25 29.8	+ 3.4	2.6	+ 0.5
	28	F.	I	5 46 38.48	− 0.37	. .	. .	.	. . . .	. .	. .	. .
	31	E.	I	6 7 7.29	− 0.33	. .	. .	.	64 24 5.4	− 0.1	3.4	0.0
June	4	E.	I	6 31 8.10	− 0.26	. .	. .	.	64 50 43.7	+ 2.2	2.9	+ 0.8
	21	F.	I	7 23 56.01	− 0.39	. .	. .	N.	69 16 41.2	+ 0.7	. .	. .
July	25	E.	II	6 58 22.34	− 0.16	. .	. .	.	69 30 14.9	+ 2.3	4.0	0.0
Aug.	4	E.	II	7 54 4.05	− 0.16	. .	. .	S.	68 59 26.0	+ 2.2	. .	. .
	8	P.	II	8 24 41.91	+ 0.03	. .	. .	S.	69 47 42.0	+ 2.2	. .	. .
	9	Sk.	II	8 32 45.61	− 0.16	. .	. .	S.	70 6 26.0	+ 0.6	. .	. .
	30	P.	.	11 6 17.00	− 0.01	0.15	+ 0.02	.	82 47 0.5	+ 1.8	2.8	− 0.4
Sept.	3	F.	I	11 31 59.98	+ 0.01	. .	. .	.	. . . .	. .	. .	. .
	4	P.	C	11 38 10.12	+ 0.03	. .	. .	C.	86 40 27.7	+ 2.0	. .	. .
	8	P.	C	12 2 4.04	+ 0.05	. .	. .	C.	89 44 40.2	+ 2.4	. .	. .
	11	F.	I	12 19 12.29	+ 0.13	. .	. .	.	91 59 33.6	+ 1.9	3.8	− 1.2
	24	P.	I	13 27 13.71	+ 0.21	. .	. .	C.	100 51 2.7	− 0.4	. .	. .
	25	F.	I	13 32 3.82	− 0.02	. .	. .	C.	107 27 14.5	− 1.1	. .	. .
Oct.	2	E.	I	14 3 56.76	+ 0.04	. .	. .	S.	105 15 18.5	− 3.9	. .	. .
	8	Sk.	I	14 27 8.80	+ 0.10	. .	. .	N.	107 45 58.9	+ 2.0	. .	. .
	13	Sk.	I	14 41 14.23	+ 0.13	. .	. .	N.	109 6 4.5	+ 3.0	. .	. .
Nov.	5	Sk.	II	13 52 24.40	+ 0.32	. .	. .	S.	99 49 32.1	+ 1.9	. .	. .
	10	E.	II	13 56 13.60	+ 0.19	. .	. .	S.	99 28 47.5	+ 4.5	. .	. .
	11	P.	II	13 58 42.72	+ 0.15	. .	. .	S.	99 39 13.6	+ 2.4	. .	. .
	16	P.	II	14 17 7.79	+ 0.07	. .	. .	S.	101 19 46.8	+ 2.6	. .	. .
	18	E.	II	14 26 31.32	+ 0.23	. .	. .	.	102 14 37.9	+ 2.3	2.7	− 0.4
	21	Sk.	II	14 41 59.83	+ 0.08	. .	. .	S.	103 44 17.4	− 1.8	. .	. .
Dec.	1	F.	II	15 40 32.22	+ 0.27	. .	. .	.	. . . .	. .	. .	. .
	12	E.	II	16 51 29.85	+ 0.30	. .	. .	C.	113 0 50.4	+ 6.1	. .	. .
	15	P.	II	17 41 41.31	+ 0.05	. .	. .	C.	113 48 4.1	+ 10.8	. .	. .
	19	P.	II	17 39 6.16	+ 0.19	. .	. .	C.	114 33 38.6	+ 1.6	. .	. .
	20	E.	II	17 46 2.31	+ 0.38	. .	. .	C.	114 41 51.2	+ 1.7	. .	. .

VENUS.

Date.	Observer.	Part obs'd.	Apparent Right Ascension of Center.	Correction to—		Sid. Time of Transit of Semi-diam.	Corr'n to Am. Eph.	Part obs'd.	Geocentric N. P. Distance of Center.	Correction to—		Vertical Semi-diameter.	Corr'n to Am. Eph.
				Am. Eph.	Le Verrier's Tables.					Am. Eph.	Le Verrier's Tables.		
1875.			h. m. s.	s.	s.	s.	s.		° ′ ″	″	″	″	″
Jan. 19	F.	.	. . . . . .	. .	. .	. .	. .	.	107 53 59.7	− 2.2	− 0.2	20.2	+ 1.3
Feb. 7	E.	.	. . . . . .	. .	. .	. .	. .	S.	109 25 46.5	+ 1.6	+ 0.9	. .	. .
11	E.	II	18 29 16.16	+ 0.23	+ 0.12	. .	. .	.	109 35 20.0	+ 1.1	0.0	13.8	+ 0.1
15	E.	II	18 45 55.69	+ 0.11	+ 0.06	. .	. .	.	109 39 1.6	+ 1.3	+ 0.2	13.7	+ 0.7
21	S.	II	19 11 47.10	+ 0.15	+ 0.07	. .	. .	.	109 31 55.5	+ 2.0	+ 0.3	12.2	+ 0.1
25	S.	.	. . . . . .	. .	. .	. .	. .	.	109 17 54.0	+ 0.4	− 1.5	12.6	+ 0.9
Mar. 7	E.	II	20 14 40.81	+ 0.15	+ 0.05	. .	. .	.	108 8 18.4	+ 6.6	+ 4.4	12.9	+ 2.3
9	F.	II	20 23 49.16	+ 0.43	+ 0.35	. .	. .	.	107 48 19.4	+ 6.2	+ 4.0	9.8	− 0.6
10	Sk.	II	20 28 23.14	+ 0.08	0.00	. .	. .	.	107 37 31.7	+ 2.6	+ 0.4	10.5	+ 0.2
11	E.	II	20 32 57.83	+ 0.30	+ 0.22	. .	. .	.	107 26 17.6	+ 2.4	+ 0.2	9.9	− 0.3
22	Sk.	II	21 23 14.37	+ 0.15	+ 0.06	. .	. .	.	104 51 12.4	+ 3.5	+ 0.8	8.9	− 0.3
April 4	E.	II	22 21 59.26	+ 0.11	+ 0.02	. .	. .	N.	100 40 55.6	+ 4.0	+ 1.8	. .	. .
13	F.	II	23 2 0.16	+ 0.09	− 0.01	. .	. .	.	97 14 8.4	+ 1.7	− 0.3	7.8	− 0.1
21	F.	II	23 37 12.08	+ 0.29	+ 0.22	. .	. .	.	. . . .	. .	. .	. .	. .
29	F.	II	0 12 14.13	+ 0.32	+ 0.28	. .	. .	.	90 23 51.6	+ 0.7	− 0.6	8.0	+ 0.8
May 10	E.	II	1 0 32.72	+ 0.05	+ 0.01	. .	. .	.	. . . .	. .	. .	. .	. .
14	E.	II	1 18 15.93	− 0.01	− 0.03	. .	. .	.	83 42 11.3	+ 0.7	0.0	6.5	− 0.2
18	E.	II	1 36 7.29	− 0.09	− 0.11	. .	. .	.	81 57 9.7	+ 0.5	− 0.1	6.3	− 0.2
27	F.	II	2 16 58.78	− 0.04	− 0.03	. .	. .	N.	78 10 3.2	− 1.7	− 1.5	. .	. .
30	E.	II	2 30 51.08	− 0.06	− 0.12	. .	. .	.	76 58 19.7	− 0.1	+ 0.3	6.7	+ 0.5
31	F.	II	2 35 30.53	− 0.07	− 0.03	. .	. .	.	76 34 59.3	+ 2.2	+ 2.6	6.7	+ 0.6
June 3	E.	II	2 49 34.59	− 0.07	− 0.06	. .	. .	.	75 26 38.2	+ 1.6	+ 2.1	6.5	+ 0.4
July 7	E.	II	5 40 3.00	− 0.05	− 0.06	. .	. .	.	67 8 59.5	− 0.8	+ 0.5	5.7	+ 0.3
25	E.	II	7 15 23.55	− 0.04	− 0.05	. .	. .	.	67 26 6.9	+ 0.8	+ 2.3	5.7	+ 0.5
Aug. 4	E.	II	8 7 41.29	− 0.04	− 0.08	. .	. .	.	69 8 34.5	+ 0.4	+ 1.8	6.1	+ 1.0
8	P.	II	8 28 19.71	+ 0.19	+ 0.15	. .	. .	.	70 6 55.0	+ 1.1	+ 2.1	4.8	− 0.3
19	P.	.	9 23 36.76	+ 0.07	+ 0.01	0.35	0.00	.	73 32 40.9	0.0	+ 1.3	5.2	+ 0.2
25	Sk.	.	9 52 54.66	0.00	− 0.07	0.37	+ 0.02	.	75 49 23.1	+ 0.1	+ 1.0	5.4	+ 0.4
29	P.	.	10 12 7.53	+ 0.01	+ 0.12	0.33	− 0.01	.	77 28 36.7	+ 3.0	+ 3.5	4.6	− 0.4
31	P.	.	10 21 38.05	− 0.15	− 0.23	0.35	+ 0.01	.	78 20 16.5	0.0	+ 0.4	4.2	− 0.8
Sept. 2	F.	.	10 31 5.70	+ 0.02	− 0.05	0.34	0.00	.	79 13 15.1	− 0.5	− 0.1	4.7	− 0.3
3	P.	.	10 35 48.15	− 0.04	− 0.10	0.32	− 0.02	.	79 40 15.5	+ 1.8	+ 2.2	4.7	− 0.3
Oct. 13	Sk.	.	13 35 18.34	+ 0.05	0.00	0.34	0.00	.	98 53 42.5	+ 1.4	+ 0.2	5.0	0.0
20	P.	I	14 8 21.00	+ 0.19	+ 0.16	. .	. .	.	102 10 32.5	+ 0.5	− 0.8	4.6	− 0.4
21	Sk.	.	14 13 7.93	+ 0.21	+ 0.18	0.35	+ 0.01	.	102 37 39.9	+ 3.6	+ 2.2	5.2	+ 0.2
25	Sk.	.	14 32 25.96	+ 0.10	+ 0.06	0.33	− 0.02	.	104 22 47.4	+ 3.8	+ 2.4	5.8	+ 0.8
28	P.	I	14 47 6.20	+ 0.04	0.00	. .	. .	.	105 37 54.1	+ 1.6	+ 0.2	4.8	− 0.3
Nov. 2	P.	I	15 11 57.19	+ 0.05	+ 0.02	. .	. .	.	107 35 0.4	+ 1.1	− 0.3	5.0	− 0.1
9	P.	I	15 47 36.22	− 0.03	− 0.04	. .	. .	.	109 59 5.8	+ 2.7	+ 1.1	4.9	− 0.2
11	E.	I	15 57 58.41	− 0.05	− 0.06	. .	. .	.	110 35 28.8	+ 4.2	+ 2.6	7.1	+ 1.9
22	Sk.	I	16 56 20.93	− 0.26	− 0.29	. .	. .	.	. . . .	. .	. .	. .	. .
30	Sk.	.	17 39 55.40	− 0.20	− 0.22	0.48	− 0.10	.	114 13 41.0	+ 1.6	+ 1.1	6.8	+ 1.5
Dec. 13	E.	I	18 51 21.27	− 0.11	− 0.12	. .	. .	.	114 13 4.7	+ 6.4	+ 5.1	6.2	+ 0.8
20	P.	I	19 29 25.05	− 0.06	− 0.07	. .	. .	.	113 20 23.7	+ 2.2	+ 1.1	5.1	− 0.4
21	E.	I	19 34 48.20	− 0.10	− 0.11	. .	. .	.	113 10 1.8	+ 4.2	+ 3.0	5.9	+ 0.3
23	Sk.	I	19 45 31.72	− 0.14	− 0.15	. .	. .	.	112 47 7.6	+ 3.4	+ 2.3	6.4	+ 0.8
27	Sk.	I	20 6 46.14	− 0.23	− 0.23	. .	. .	.	111 53 12.7	+ 4.0	+ 3.1	6.5	+ 0.9

MARS.

Date.	Observer.	Limb.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Limb.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
1875.			h. m. s.	s.	s.	s.		° ′ ″	″	″	″
Mar. 27	Sk.	.	17 24 24.01	+ 0.17	0.53	+ 0.15	.	112 57 4.8	+ 1.6	8.3	+ 2.9
April 24	Sk.	.	18 6 19.42	+ 0.46	0.57	+ 0.05	.	114 5 21.2	+ 0.3	7.2	+ 0.2
June 19	Sk.	.	17 53 43.86	+ 1.09	0.98	+ 0.11	.	117 23 29.7	− 0.4	12.8	+ 1.3
July 14	E.	.	17 24 24.48	+ 0.93	0.88	+ 0.04	.	117 57 15.2	+ 1.2	11.8	+ 0.6
30	E.	.	17 21 57.26	+ 0.76	0.80	+ 0.04	.	117 51 15.4	+ 0.9	10.3	+ 0.2
Aug. 5	P.	.	17 25 6.95	+ 0.62	0.76	+ 0.04	.	117 47 58.8	+ 1.7	10.9	+ 1.3
9	P.	.	17 28 23.55	+ 0.64	0.70	0.00	.	117 45 38.0	+ 0.7	9.4	+ 0.1
21	P.	.	17 43 8.95	+ 0.55	0.70	+ 0.06	.	117 36 27.5	+ 2.4	8.8	+ 0.4
25	P.	.	17 49 30.20	+ 0.56	0.60	− 0.02	.	117 31 58.3	+ 1.7	8.3	+ 0.1
26	Sk.	.	17 51 11.43	+ 0.46	0.72	+ 0.10	.	117 30 39.8	0.0	10.9	+ 2.8
30	P.	.	17 58 19.58	+ 0.57	0 60	0.00	.	117 24 49.2	+ 2.5	8.7	+ 0.8
Sept. 1	P.	.	18 2 6.49	+ 0.51	0.64	+ 0.06	.	117 21 19.1	+ 0.6	8.2	+ 0.5
8	P.	I	18 16 22.30	+ 0.46	. .	. .	.	117 6 2.5	+ 1.2	7.6	+ 0.3
21	F.	I	18 46 16.17	+ 0.21	. .	. .	.	116 20 53.5	− 0.6	8.9	+ 2.4
Oct. 2	E.	.	19 14 6.02	+ 0.37	0.59	+ 0.15	.	115 21 55.3	+ 1.1	7.3	+ 1.2
9	P.	I	19 32 39.15	+ 0.33	. .	. .	S.	114 33 7.0	+ 1.1	. .	. .
20	P.	I	20 2 36.03	+ 0.29	. .	. .	S.	112 58 2.9	+ 1.9	. .	. .
21	F.	I	20 5 21.10	+ 0.12	. .	. .	.	112 48 17.9	+ 2.3	7.1	+ 1.8
Nov. 6	Sk.	.	20 49 45.72	+ 0.43	0.55	+ 0.21	.	109 47 38.6	+ 1.5	6.5	+ 1.7
12	P.	I	21 6 25.82	+ 0.22	. .	. .	S.	108 28 43.3	+ 3.1	. .	. .

JUPITER.

Date.	Observer.	Limb.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Limb.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
Feb. 22	S.	.	13 59 39.21	+ 0.68	1.45	+ 0.05	.	100 41 9.0	+ 2.9	21.4	+ 1.7
April 21	E.	.	13 39 14.83	+ 0.79	1.55	+ 0.03	.	98 40 55.1	+ 1.5	22.6	+ 1.4
30	F.	.	13 35 2.26	+ 0.80	1.52	+ 0.01	.	98 17 27.6	+ 0.4	21.1	0.0
May 7	E.	.	13 31 59.64	+ 0.75	1.51	+ 0.01	.	98 0 48.2	+ 3.0	22.0	+ 1.1
11	E.	.	13 30 23.51	+ 0.88	1.54	+ 0.05	.	97 52 5.8	+ 1.7	22.2	+ 1.4
12	F.	.	13 30 0.46	+ 0.82	1.54	+ 0.05	.	97 50 3.6	+ 3.0	21.5	+ 0.8
13	Sk.	.	13 29 37.92	+ 0.82	1.40	− 0.08	.	94 48 0.5	+ 0.5	21.9	+ 1.2
17	F.	.	. . . .	. .	. .	. .	.	97 40 29.3	+ 1.5	21.4	+ 0.8
19	E.	.	13 27 32.87	+ 0.74	1.57	+ 0.10	.	97 37 5.9	+ 5.4	21.4	+ 0.9
27	E.	.	13 25 16.50	+ 0.85	1.49	+ 0.05	.	97 25 28.9	+ 0.5	21.3	+ 1.1
28	F.	.	13 25 2.02	+ 0.80	1.45	+ 0.01	.	97 24 19.1	+ 1.0	21.0	+ 0.9
31	E.	.	13 24 22.30	+ 0.68	1.48	− 0.05	.	97 21 12.7	+ 2.6	22.0	+ 2.0
June 9	F.	.	13 22 58.00	+ 0.58	1.39	0.00	.	. . . .	. .	. .	. .
11	Sk.	.	13 22 46.68	+ 0.71	1.34	− 0.05	.	97 14 46.4	+ 2.7	20.2	+ 0.8
16	E.	.	13 22 29.74	+ 0.69	1.43	+ 0.06	.	97 14 31.4	+ 1.3	20.3	+ 1.1
23	F.	.	13 22 34.10	+ 0.73	1.31	− 0.04	.	97 17 0.8	+ 1.5	18.4	− 0.4
26	F.	.	. . . .	. .	. .	. .	.	97 19 4.0	+ 1.6	17.8	− 0.8
July 8	E.	.	13 24 31.50	+ 0.60	1.30	0.00	.	97 33 3.2	+ 1.9	17.3	− 0.8

SATURN.

Date.	Observer.	Limb.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Limb.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
Aug. 9	P.	.	21 43 53.22	− 1.38	0.62	− 0.03	.	105 7 3.7	+ 15.7	8.5	− 0.3
20	P.	.	21 40 41.02	− 1.59	0.62	− 0.03	.	105 24 4.5	+ 15.8	8.3	− 0.5
21	P.	.	21 40 23.72	− 1.48	0.64	− 0.01	.	105 25 35.8	+ 16.2	8.8	0.0
25	P.	.	21 39 14.61	− 1.51	0.56	− 0.09	.	105 31 33.2	+ 15.4	8.6	− 0.2
26	Sk.	.	21 38 57.42	− 1.62	1.54	. .	.	105 32 59.4	+ 13.7	10.4	+ 1.6
30	P.	.	21 37 50.14	− 1.51	0.67	+ 0.02	.	105 38 44.6	+ 14.7	9.0	+ 0.2
31	F.	.	. . . . .	. .	. .	. .	.	105 40 10.2	+ 16.4	9.0	+ 0.2
Sept. 1	P.	.	21 37 17.04	− 1.65	0.66	+ 0.01	.	105 41 31.1	+ 14.4	8.5	− 0.3
3	F.	.	21 36 44.69	− 1.65	0.66	+ 0.01	.	105 44 15.4	+ 16.0	9.0	+ 0.2
4	P.	.	21 36 28.84	− 1.56	0.66	+ 0.01	.	105 45 35.1	+ 15.9	8.5	− 0.3
7	F.	.	21 35 41.96	− 1.68	0.76	+ 0.11	.	105 49 27.4	+ 15.4	9.0	+ 0.2
8	P.	.	21 35 26.82	− 1.62	0.54	− 0.11	.	105 50 43.1	+ 15.8	9.1	+ 0.3
14	P.	.	21 34 0.14	− 1.68	0.57	− 0.08	.	105 57 46.4	+ 15.1	8.6	− 0.1
20	P.	.	21 32 42.32	− 1.70	0.60	− 0.04	.	106 4 0.1	+ 16.0	8.8	+ 0.1
24	P.	.	21 31 56.02	− 1.82	0.60	− 0.04	.	106 7 36.9	+ 15.0	8.8	+ 0.2
27	F.	.	21 31 24.60	− 1.81	0.64	0.00	.	106 10 4.7	+ 17.0	9.0	+ 0.4
Oct. 2	E.	.	21 30 38.83	− 1.85	0.61	− 0.03	.	106 13 32.3	+ 16.7	9.4	+ 0.9
8	Sk.	.	21 29 55.74	− 1.79	1.49	. .	.	. . . . .	. .	. .	. .
12	F.	.	21 29 34.34	− 1.85	0.66	+ 0.03	.	106 18 7.8	+ 14.8	8.9	+ 0.5
13	Sk.	.	21 29 30.02	− 1.80	0.66	+ 0.04	.	106 18 25.8	+ 15.6	9.5	+ 1.1
20	P.	.	21 29 10.34	− 1.74	0.58	− 0.04	.	106 19 33.5	+ 16.6	8.4	+ 0.1
27	F.	.	21 29 10.14	− 1.77	0.63	+ 0.02	.	106 19 3.3	+ 15.4	8.4	+ 0.2
Nov. 2	P.	.	21 29 25.78	− 1.79	0.57	− 0.03	.	106 17 21.7	+ 14.4	8.3	+ 0.2
6	Sk.	.	21 29 44.35	− 1.77	0.60	0.00	.	106 15 35.9	+ 16.6	9.1	+ 1.0
12	P.	.	21 30 24.09	− 1.79	0.48	− 0.12	.	106 11 59.2	+ 17.8	8.1	+ 0.1

URANUS.

Date.	Observer	Limb.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Limb.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
1875.			h. m. s.	s.	s.	s.		° ′ ″	″	″	″
Mar. 13	F.	.	8 57 23.25	+ 0.82	. .	. .	.	72 1 50.8	+ 16.3	. .	. .
April 21	E.	.	8 55 10.08	+ 0.68	. .	. .	.	71 53 52.3	+ 15.7	. .	. .
Dec. 20	P.	.	9 29 23.34	+ 1.04	. .	. .	.	74 23 45.3	+ 18.7	. .	. .
22	F.	.	9 29 12.37	+ 1.03	. .	. .	.	74 22 47.9	+ 18.4	. .	. .

NEPTUNE.

Date.	Observer	Limb.	Apparent Right Ascension of Center.	Corr'n to Am. Eph.	Sidereal Time of Transit of Semi-diameter.	Corr'n to Am. Eph.	Limb.	Geocentric N. P. Distance of Center.	Corr'n to Am. Eph.	Vertical Semi-diameter.	Corr'n to Am. Eph.
Jan. 14	Sk.	.	1 46 38.35	+ 0.11	. .	. .	.	80 51 43.8	+ 0.5	. .	. .
15	E.	.	1 46 39.20	+ 0.12	. .	. .	.	80 51 35.5	+ 0.8	. .	. .
Sept. 4	P.	.	2 5 0.91	+ 0.20	. .	. .	.	79 13 29.7	— 0.2	. .	. .
8	P.	.	2 4 46.20	+ 0.17	. .	. .	.	79 15 59.8	— 0.7	. .	. .
14	P.	.	2 4 21.25	+ 0.17	. .	. .	.	79 17 29.9	— 1.1	. .	. .
24	P.	.	2 3 32.58	+ 0.10	. .	. .	.	79 22 14.0	— 1.7	. .	. .
27	F.	.	2 3 16.54	+ 0.15	. .	. .	.	79 23 47.0	— 0.9	. .	. .
Oct. 4	P.	.	2 2 36.76	+ 0.11	. .	. .	.	79 27 34.0	0.0	. .	. .
9	P.	.	2 2 6.79	+ 0.11	. .	. .	.	79 30 19.6	— 2.2	. .	. .
25	Sk.	.	2 0 25.73	+ 0.01	. .	. .	.	79 39 36.2	— 0.4	. .	. .
27	F.	.	2 0 13.06	+ 0.15	. .	. .	.	79 40 45.9	0.0	. .	. .
28	P.	.	2 0 6.59	+ 0.09	. .	. .	.	79 41 20.1	— 0.4	. .	. .
Nov. 2	P.	.	1 59 34.78	+ 0.14	. .	. .	.	79 44 12.0	+ 0.5	. .	. .
5	P.	.	1 59 15.83	+ 0.06	. .	. .	.	79 45 52.0	0.0	. .	. .
6	Sk.	.	1 59 9.70	+ 0.17	. .	. .	.	79 46 24.3	— 0.8	. .	. .
10	Sk.	.	1 58 45.02	+ 0.10	. .	. .	.	79 48 35.9	+ 1.0	. .	. .
11	E.	.	1 58 38.99	+ 0.13	. .	. .	.	79 49 7.3	+ 0.6	. .	. .
12	P.	.	1 58 33.04	+ 0.20	. .	. .	.	79 49 38.6	+ 0.4	. .	. .
15	E.	.	1 58 15.25	+ 0.15	. .	. .	.	79 51 12.5	+ 1.7	. .	. .
17	P.	.	1 58 3.67	+ 0.15	. .	. .	.	79 52 10.2	— 0.6	. .	. .
24	F.	.	1 57 25.07	+ 0.15	. .	. .	.	79 55 29.1	+ 0.6	. .	. .
27	F.	.	1 57 9.58	+ 0.12	. .	. .	.	79 56 45.9	— 0.7	. .	. .
30	Sk.	.	1 56 54.71	+ 0.01	. .	. .	.	79 58 59.7	— 0.6	. .	. .
Dec. 2	F.	.	1 56 45.38	+ 0.10	. .	. .	.	79 58 46.9	0.0	. .	. .
10	Sk.	.	1 56 11.66	+ 0.27	. .	. .	.	80 1 29.0	— 1.5	. .	. .
17	E.	.	1 55 47.35	+ 0.21	. .	. .	.	80 3 23.6	+ 1.8	. .	. .
18	F.	.	1 55 44.40	+ 0.28	. .	. .	.	80 3 36.4	+ 1.3	. .	. .
20	P.	.	1 55 38.58	+ 0.14	. .	. .	.	80 4 1.1	+ 1.3	. .	. .
22	F.	.	1 55 33.37	+ 0.16	. .	. .	.	80 4 22.4	+ 0.7	. .	. .
23	Sk.	.	1 55 30.81	+ 0.03	. .	. .	.	80 4 32.2	+ 0.5	. .	. .
27	Sk.	.	1 55 22.53	+ 0.27	. .	. .	.	80 5 4.7	+ 0.2	. .	. .

SMALL PLANETS.

The observations of ① to ⑤ inclusive have been compared with the ephemerides of the British Nautical Almanac. The remainder have been compared with the ephemerides of the Berlin Jahrbuch.

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension of Center.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
CERES, ①.								
1875.		h. m.	h. m.	h. m. s.	s.	° ′ ″	″	
Jan. 14	Sk.	. . .	. . .	6 15 43.59	+ 8.49	60 43 36.8	−22.9	
PALLAS, ②.								
Jan. 11	E.	. . .	. . .	2 37 16.75	− 0.95	114 10 48.7	− 1.5	
14	Sk.	. . .	. . .	2 38 58.10	− 1.19	113 38 1.8	− 0.8	
JUNO, ③.								
Jan 11	E.	. . .	. . .	2 57 35.96	+ 5.70	91 41 46.6	− 7.1	
15	E.	. . .	. . .	3 1 5.69	+ 5.68	91 0 44.5	− 4.2	
VESTA, ④.								
Jan. 11	E.	. . .	. . .	3 50 9.98	+ 0.30	74 30 6.5	− 0.7	
14	Sk.	. . .	. . .	3 49 47.29	+ 0.25	74 20 7.6	− 1.5	
ASTRÆA, ⑤.								
Jan. 11	E.	. . .	. . .	4 22 54.32	− 9.14	75 29 34.9	+38.0	
FLORA, .								
April 5	E.	12 33.2	18 22.2	13 29 39.22	+ 6.48	88 57 32.7	+38.8	
7	F.	12 22.5	18 11.5	13 27 41.79	+ 6.76	88 44 55.7	+41.8	
METIS, ⑨.								
Sept. 3	F.	13 26.2	19 17.0	0 18 6.29	− 2.51	99 18 18.5	−58.9	Probably 5 revs. = 1′ 16″.6 wrong.
4	P.	13 21.6	19 12.4	0 17 23.51	− 2.41	98 25 26.1	+17.4	
7	F.	13 7.4	18 58.3	0 15 6.98	− 2.68	98 43 7.6	+17.9	
20	P.	12 4.9	17 56.1	0 3 38.65	− 2.78	99 56 37.2	+17.7	
27	F.	11 30.8	17 22.0	23 56 59.46	− 2.52	100 29 26.5	+16.1	
Oct. 2	E.	11 6.6	16 57.8	23 52 21.42	− 2.71	100 48 0.2	+17.8	
5	Sk.	10 52.0	16 43.1	23 49 42.70	− 2.59	100 56 44.7	+16.4	
9	F.	10 33.1	16 24.1	23 46 24.34	− 2.60	101 5 23.7	+13.6	
HYGEIA, ⑩.								
Dec. 20	P.	13 44.3	19 26.1	7 41 58.83	−10.16	68 41 3.4	−178.3	

VICTORIA, ⑫.

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension of Center.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
1875.		h. m.	h. m.	h. m. s.	s.	° ′ ″	″	
Sept. 24	P.	11 59.1	17 52.3	0 13 33.56	− 11.83	74 42 22.5	+ 53.8	
Oct. 4	P.	11 11.6	17 4.6	0 5 20.01	− 11.53	76 27 58.0	+ 60.9	
7	F.	10 57.8	16 50.7	. . . .	. .	77 1 36.4	+ 61.6	
9	F.	10 48.3	16 41.2	0 1 42.95	− 11.16	77 24 6.8	+ 59.7	
12	F.	10 34.6	16 27.3	23 59 47.46	− 10.98	77 57 51.5	+ 61.7	
20	P.	9 59.2	15 51.6	23 55 45.47	− 10.23	79 24 50.0	+ 61.2	

EGERIA, ⑬.

Oct. 28	P.	13 14.1	19 3.1	3 42 45.92	+ 0.75	67 12 38.0	− 7.5
Nov. 2	P.	12 49.2	18 38.4	3 37 38.20	+ 0.69	66 50 4.5	− 7.4
5	P.	12 34.1	18 23.4	3 34 18.76	+ 0.64	66 37 31.3	− 7.2
8	F.	12 18.9	18 8.3	3 30 50.74	+ 0.67	66 25 44.1	− 8.6
11	E.	12 3.6	17 53.1	3 27 16.18	+ 0.67	66 14 47.7	− 8.7
12	P.	11 58.4	17 47.9	3 26 3.53	+ 0.58	66 11 19.6	− 9.3
17	P.	11 32.6	17 22.1	3 19 56.69	+ 0.63	66 55 25.9	− 10.7
30	Sk.	10 26.3	16 15.6	3 4 38.90	+ 0.86	65 24 17.2	− 10.0
Dec. 2	F.	10 16.3	16 5.6	3 2 31.13	+ 0.74	65 20 33.9	− 6.2

LUTETIA, ㉑.

Nov. 12	P.	13 31.6	19 18.9	4 59 32.21	− 3.03	68 32 21.9	+ 2.1
17	P.	13 7.2	18 56.7	4 54 50.53	− 3.02	68 33 52.3	+ 1.6
29	P.	12 7.3	17 56.9	4 41 59.21	− 3.09	68 41 0.7	+ 6.6
30	Sk.	12 2.3	17 51.9	4 40 52.17	− 2.99	68 41 46.0	+ 5.9
Dec. 17	E.	10 37.5	16 26.9	4 22 56.83	− 3.12	68 56 0.5	+ 6.5
20	P.	10 23.1	10 10.0	4 20 15.90	− 3.10	68 58 9.7	+ 5.3

PHOCÆA, ㉕.

April 5	E.	10 31.9	16 20.3	11 27 58.61	+ 4.01	105 15 25.2	+ 5.3
7	F.	10 22.7	16 11.1	11 26 33.11	+ 3.81	104 46 54.2	+ 2.3

AMPHITRITE, ㉙.

May 31	E.	12 5.9	17 53.3	16 43 1.02	+ 1.12	121 46 24.0	+ 3.7
June 4	E.	11 45.9	17 33.2	16 38 43.66	+ 1.10	121 41 29.4	+ 6.3
9	F.	11 20.9	17 8.3	16 33 26.25	+ 1.13	121 32 36.9	+ 5.3

POMONA, ㉜.

Nov. 2	P.	12 58.4	18 45.4	3 49 46.21	− 0.57	71 40 28.3	+ 3.1
5	P.	12 47.0	18 34.1	3 47 13.97	− 0.53	71 54 44.7	+ 2.0
8	F.	12 32.6	18 19.8	3 44 34.63	− 0.58	72 9 27.1	− 0.1
11	E.	12 18.1	18 5.4	3 41 50.18	− 0.39	72 24 36.3	+ 3.6
12	P.	12 13.2	18 0.5	3 40 54.20	− 0.58	72 29 41.5	+ 3.6
17	P.	11 48.9	17 36.2	3 36 11.34	− 0.52	72 55 22.2	+ 2.6

EUGENIA, ㊺.

June 4	E.	12 20.4	18 9.6	17 13 15.53	− 15.87	102 33 18.8	− 27.8
9	F.	11 56.2	17 45.4	17 8 49.76	− 15.99	102 32 3.4	− 26.0
13	F.	11 37.0	17 26.2	17 5 18.44	− 15.81	102 32 50.2	− 24.5

CALYPSO, (53).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension of Center.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
1875.		h. m.	h. m.	h. m. s.	s.	° ′ ″	″	
April 5	E.	11 27.5	17 16.3	12 23 41.05	− 4.53	86 13 4.4	− 24.0	

CONCORDIA, (58).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension of Center.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
Sept. 8	P.	13 2.4	18 48.9	0 13 55.53	− 0.57	90 45 57.5	+ 2.3	
24	P.	11 47.4	17 34.1	0 1 48.98	− 0.43	92 34 7.8	+ 3.8	
27	F.	11 33.3	17 20.0	. . . .	. .	92 54 13.0	+ 6.7	
Oct. 2	E.	11 9.8	16 56.4	23 55 38.79	− 0.54	93 26 24.8	+ 6.9	
5	Sk.	10 55.8	16 42.3	. . . .	. .	93 44 36.6	+ 2.3	
7	F.	10 46.7	16 33.1	23 52 2.81	− 0.01	93 56 11.1	− 2.6	

ECHO, (60).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension of Center.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
Sept. 24	P.	12 42.2	18 33.0	0 56 46.96	+ 1.84	83 38 12.8	− 11.2	
Oct. 4	P.	11 54.3	17 45.4	0 48 12.39	+ 1.87	84 52 17.7	− 8.4	
5	Sk.	11 49.5	17 40.7	0 47 18.61	+ 1.99	85 0 0.1	− 12.0	
7	F.	11 39.9	17 30.1	0 45 30.47	+ 1.98	85 15 34.4	− 11.2	
9	F.	11 30.2	17 20.4	0 43 42.28	+ 1.83	85 31 8.7	− 12.5	
12	F.	11 15.7	17 5.9	0 41 2.00	. .	85 54 26.0	. .	

NIOBE, (71).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension of Center.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
Sept. 3	F.	12 29.8	18 14.1	23 21 38.69	+ 1.04	71 11 13.2	− 2.4	
8	P.	12 5.2	17 49.6	23 16 35.47	+ 1.06	71 9 0.0	+ 0.3	
14	P.	11 35.5	17 19.9	23 10 28.81	+ 1.05	71 13 4.5	− 2.2	
20	P.	11 6.0	16 50.3	23 4 30.32	+ 0.96	71 24 0.6	− 1.3	
24	P.	10 46.1	16 30.7	23 0 41.72	. .	71 34 39.0	. .	

EURYDICE, (75).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension of Center.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
Sept. 3	F.	13 13.2	19 7.6	0 4 41.80	+ 1.16	91 24 42.2	− 6.9	
4	P.	13 8.2	19 2.7	0 4 1.21	+ 1.10	91 24 11.6	− 7.2	
7	F.	12 54.3	18 48.8	0 1 52.12	+ 0.97	91 23 10.4	− 7.6	
8	P.	12 49.6	18 44.1	0 1 6.99	+ 1.01	91 22 58.8	− 8.1	
14	P.	12 21.2	18 15.7	23 56 19.39	+ 0.94	91 23 0.9	− 8.1	
20	P.	11 52.7	17 47.2	23 51 17.60	+ 0.99	91 24 5.5	− 8.0	
24	P.	11 33.6	17 28.0	23 47 58.32	+ 0.80	91 24 44.8	− 7.6	
Oct. 2	E.	10 56.1	16 50.3	23 41 53.13	+ 1.01	91 23 59.6	− 6.6	
5	Sk.	10 42.2	16 36.3	23 39 54.61	+ 0.98	91 22 27.9	− 7.8	
7	F.	10 33.3	16 24.3	23 38 42.87	+ 1.03	91 21 0.5	− 5.8	
9	P.	10 24.3	16 18.2	23 37 37.16	+ 0.81	91 19 3.1	− 8.9	

FREIA, (76).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension of Center.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
Dec. 17	E.	10 38.6	16 24.5	4 23 59.74	−15.99	70 26 43.0	+ 35.1	
19	Sk.	10 29.3	16 15.4	4 22 35.74	. .	70 30 25.8	. .	
20	P.	10 24.7	16 10.8	4 21 54.76	. .	70 32 12.9	. .	

ALCMENE, (82).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension of Center.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
April 5	E.	12 23.7	18 13.7	13 20 7.58	+ 0.67	97 44 49.8	+ 4.2	

JULIA, (89).

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension of Center.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
Dec. 20	P.	12 46.1	18 34.7	6 43 44.51	− 5.77	51 4 5.6	− 86.7	
22	F.	12 35.0	18 23.6	6 41 4.25	− 5.83	51 10 30.0	− 87.4	

Date.	Observer.	Washington Mean Time.	Berlin Mean Time corrected for Aberration.	Apparent Right Ascension of Center.	Corr'n to Ephem.	Geocentric N. P. Distance of Center.	Corr'n to Ephem.	NOTES.
CLOTHO, (97).								
1875.		h. m.	h. m.	h. m. s.	s.	° ′ ″	″	
Oct. 20	P.	13 38.8	19 31.6	3 35 59.64	. .	90 6 31.2	. .	
25	Sk.	13 17.0	19 9.9	3 33 51.59	+ 7.63	90 58 56.1	− 25.6	
28	P.	13 3.7	18 56.6	3 32 15.91	+ 7.58	91 29 4.3	− 23.2	
29	Sk.	12 59.1	18 52.1	3 31 41.47	+ 7.73	91 38 46.7	− 24.6	
Nov. 2	P.	12 40.8	18 33.9	3 29 11.15	+ 7.74	92 15 50.5	− 24.4	
5	P.	12 27.0	18 20.1	3 27 7.95	+ 7.72	92 41 18.6	− 26.3	
8	F.	12 13.1	18 6.2	3 24 58.37	+ 7.80	93 4 30.9	− 25.2	
11	E.	11 59.0	17 52.2	3 22 44.52	+ 7.83	93 25 6.5	− 26.1	
12	P.	11 54.3	17 47.5	3 21 59.24	+ 7.72	93 31 23.4	− 24.3	
17	P.	11 30.9	17 24.0	3 18 12.94	+ 7.60	93 57 46.0	− 22.4	
24	F.	10 58.4	16 52.2	3 13 10.91	+ 7.66	94 19 47.9	− 22.4	
27	F.	10 44.6	16 37.5	3 11 12.69	+ 7.35	94 23 41.2	− 21.0	
IANTHE, (98).								
Oct. 29	Sk.	12 32.2	18 19.6	3 4 45.95	. .	52 17 53.4	. .	
Nov. 2	P.	12 11.8	17 59.3	3 0 8.28	− 8.77	52 10 3.7	+ 30.3	
5	P.	11 56.4	17 44.0	2 56 32.66	− 8.49	52 6 46.1	+ 30.2	
8	F.	11 41.1	17 28.8	2 52 52.63	− 8.39	52 5 40.3	+ 23.9	
11	E.	11 25.6	17 13.3	2 49 10.40	− 8.76	52 7 6.3	+ 32.8	
30	Sk.	9 49.6	15 37.3	. . . . .	. .	53 1 45.6	+ 37.0	
ATE, (111).								
Oct. 20	P.	13 20.6	19 9.7	3 17 51.20	+ 2.91	63 35 19.8	+ 8.9	
25	Sk.	12 57.1	18 46.4	3 13 54.11	+ 2.98	63 42 59.8	+ 10.7	
27	F.	12 47.5	18 36.9	3 12 10.33	+ 2.99	63 47 12.9	+ 8.1	
28	P.	12 42.7	18 32.1	3 11 16.72	+ 2.88	63 49 40.1	+ 12.2	
29	Sk.	12 37.8	18 27.3	3 10 22.27	+ 2.92	63 52 12.7	+ 11.5	
Nov. 2	P.	12 18.3	18 7.9	3 6 36.00	+ 3.01	64 4 8.5	+ 13.5	
5	P.	12 3.6	17 53.3	3 3 39.57	+ 3.02	64 14 44.5	+ 13.4	
8	F.	11 48.9	17 38.6	3 0 40.18	+ 3.31	64 26 37.4	+ 11.1	
11	E.	11 34.1	17 23.9	2 57 39.63	+ 3.32	64 39 47.1	+ 12.5	
15	E.	11 14.4	17 4.2	2 53 41.45	+ 3.52	64 58 54.5	+ 11.6	
24	F.	10 30.6	16 20.3	2 45 20.00	+ 3.60	65 46 41.2	+ 7.4	
NEMESIS, (128).								
June 4	E.	10 50.0	16 36.3	15 42 39.66	. .	107 27 47.9	. .	
9	F.	. . .	. . .	. . . . .	. .	107 24 33.5	. .	

LIST

OF

PUBLICATIONS PRESENTED TO THE LIBRARY

DURING

THE YEAR 1875.

LIST OF PUBLICATIONS PRESENTED TO THE LIBRARY IN 1875.

Date of receipt.	Title and Author.	To whom acknowledged.
1875. Jan. 4	The Nautical Almanac and Astronomical Ephemeris for the year 1878, for the Meridian of the Royal Observatory of Greenwich.	The Lords Commissioners of the Admiralty.
	Journal of the Statistical Society. September, 1874	J. Whitall, Assistant Secretary of the Statistical Society, London.
	General Index to volumes 26–35, 1863–72	
	Vægtsammenligninger af Killogrammer og af de Norske Normaler for Vægt, af Dr. O. J. Broch. Christiania, 1873.	Dr. O. J. Broch, Christiania.
	Beretning om den Internationale Meterkommissions Mode i Paris 24 September–12. October 1872, af Dr. O. J. Broch.	
	On Giants Caldrons, by S. H. Sexe. Christiania, 1874	S. H. Sexe, Christiania.
	Norsk Meteorologisk Aarbog for 1872. 6th Aargang	Danish Meteorological Institute, Copenhagen.
	La question de l'Equidomoide et des Cristalloides géométriques, par le C^{te} Leopold Hugo.	Le C^{te} Leopold Hugo, Paris.
	Neunundfunfzigster Jahresbericht der naturforschenden Gesellschaft in Emden, 1873.	The Secretary of the Society of Natural Sciences, Emden.
	Atlas Météorologique de l'Observatoire de Paris. Années 1869, 70, 71.	M. U. J. Le Verrier, Director of the Imperial Observatory, Paris.
	Observations of the Magnetic Declination made at Trevandrum and Augustia Malley Observatories. Vol. I. 1874. 4to.	J. A. Brown, Esq., London.
	Weather Reports, July 1 to December 31, 1873	R. H. Scott, Director of the Meteorological Office, London.
	Weather Reports, January to June, 1874	
	Charts of Meteorological Data for Square 3 { Lat. 0°–10° N. Long. 2°–30° W. }	
	Remarks to accompany Monthly Charts of Meteorological Data for Square 3.	
	Results of Observations in Meteorology, Terrestrial Magnetism, &c., taken at the Melbourne Observatory during the year 1872, together with Abstracts from the Meteorological Observations obtained from Various Localities in Victoria. Vol. I.	R. L. J. Ellery, Government Astronomer.
27	Amphiorama, ou la Vue du Monde des Montagnes de la Spezia. Phénomène inconnu; pour la première fois observé et décrit par F. W. C. Trafford, avec une carte du Continent Polaire. Zurich.	F. W. C. Trafford, Esq., Zurich.
Feb. 4	Denkschriften der kaiserlichen Akademie der Wissenschaften. Mathematisch-naturwissenschaftliche Classe. 33. Bd. 1874.	Herr A. Schrötter, General Secretary.
	Sitzungsberichte. LXVIII. Bd., erste Abtheilung, iii bis v.; zweite Abtheilung, 8, 9, 10. LXIX. Bd., erste Abtheilung, Heft 1, 2, 3; zweite Abtheilung, 1, 2, 3.	
	Verzeichniss beobachteter Polarlichter. H. Fritz. Wien, 1873.	
	Jahrbücher der kaiserlich-königlichen Central-Anstalt für Meteorologie und Erdmagnetismus. C. Jelinek und F. Osnaghi. Neue Folge, ix. Band, Jahrgang 1872.	Dr. C. Jelinek, Vienna.
	Magnetische und meteorologische Beobachtungen kaiserlich-königlichen Sternwarte zu Prag, Jahre 1873. C. Hornstein. Prag, 1874.	Dr. C. Hornstein, Prague.
	Bulletin de la Société des Sciences Naturelles de Neuchâtel. Tome x, 1er cahier, 1874.	President of the Society of Natural Sciences of Neuchatel, Switzerland.
	Schriften der Gesellschaft zur Beförderung der gesammten Naturwissenschaften zu Marburg. Heft 7. Sitzungsberichte, 1870, 72, 73. No. 1.	President of the Society of Natural Sciences, Marburg.
	Mittheilungen aus dem Gebiete des Seewesens. Herausgegeben vom kaiserlich-königlichen hydrographischen Amte. Marine Bibliothek. Vol. II, No. xii. Pola, 1874.	Director zu den K. K. Hydrographischen Amte, Marine Bibliothek, Pola.
20	Bulletin de la Société de Géographie. Nov. et Déc. 1874	C. Maunoir, Secretary of the Geographical Society of Paris.
Mar. 30	Transactions of the Wisconsin Academy of Science, Arts, and Letters. Vol. II. 1873–74.	Secretary of the Wisconsin Academy, Madison, Wis.
	Annalen der kaiserlich-königlichen Sternwarte in Wien. Jahrgang 1872.	Dr. Carl von Littrow, Director zu K. K. Sternwarte in Wien.

Date of receipt.	Title and Author.	To whom acknowledged.
1875. Mar. 30	The Cape Catalogue of 1159 Stars, 1856–1861. Reduced to epoch 1860.	Mr. E. J. Stone, Astronomer-Royal and Superintendent of the Royal Observatory at Cape Town.
	Journal of the Statistical Society. December, 1874	Secretary of Statistical Society, London.
	Report of Lieutenant Colonel Gillmore on Compressive Strength, &c., of Building Stone. 1874.	Gen. A. A. Humphreys, Chief of Engineers, U. S. A.
	Catalogue of Plants collected in 1871, '72, '73. By Lieutenant Wheeler. 1874.	
	Report on Ornithological Specimens collected in 1871, '72, '73. By Lieutenant Wheeler. 1874.	
	Progress Report upon Geographical and Geological Explorations and Surveys west of 100th Meridian in 1872.	
	Report in reference to the Canal to connect the Chesapeake and Ohio Canal with the City of Baltimore. Col. J. J. Abert, 1838. 1874.	
	La Lunette Astronomique Horizontale, par M. A. Laussedat. Paris, 1874.	M. A. Laussedat, Paris.
	On the Lunar Zodiac of India, Arabia, and China. Prof. Wm. D. Whitney.	Prof. Wm. D. Whitney, New Haven.
April 7	Minutes of the Proceedings of the Institute of Civil Engineers. Vol. XXXIX.	James Forrest, Secretary of the Institute of Civil Engineers, London.
	Riussunto delle Osservazioni Meteoriche esequite nelle stazioni presso alle Alpi Italiani nell'anno 1872–73.	P. F. Denza, Director, Moncalieri, Italy.
	Osservazioni delle Meteore Luminose nel 1874–75	
	Sulla Distribuzione della Pioggia in Italia nell'anno meteorico 1871–72.	
	Il Congresso Internazionale dei Meteorologisti	
	Annales de l'Observatoire de Moscou. Vol. I	Prof. Dr. Th. Bredichin, Director of the Moscow Observatory.
May 3	Memoirs of the Royal Astronomical Society. Vol. XL	Secretary of the Royal Astronomical Society, London.
	Astronomical and Meteorological Observations of the Royal Observatory, Greenwich, 1872.	Sir G. B. Airy, Astronomer-Royal, Greenwich.
	Systematic Catalogue of Vertebrata of the Eocene of New Mexico, collected in 1874. E. D. Cope.	Gen. A. A. Humphreys, U. S. A., Chief of Engineers.
	Memorie della Società degli Spettroscopisti Italiani. Palermo, 1875.	Prof. P. Tacchini, Palermo.
	Mittheilungen aus dem Gebiete des Seewesens. Vol. III, Nos 3 and 4. Pola, 1875.	Director K. K. Hydrographischen Amte, Pola.
	Results of Astronomical and Meteorological Observations made at Radcliffe Observatory, 1872.	Rev. R. Main, Radcliffe Observer.
	Proceedings of the Literary and Philosophical Society of Liverpool, 1873–74.	Secretary of the Literary and Philosophical Society, Liverpool.
	Annalen der königlichen Sternwarte bei München. Band XX.	Dr. J. V. Lamont, Director der Sternwarte bei München.
	Verzeichniss von 5563 telescopischen Sternen nördlich von + 15° und südlich von — 15° Declination: Supplementband.	
22	Sitzungsberichte der kaiserlichen Akademie der Wissenschaften. Wien, 1874. I. Abtheil., Nos. 4, 5, 6, 7. II. Abtheil., Nos. 4, 5, 6, 7.	Secretary of the Imperial Academy of Vienna.
	Norsk Meteorologisk Aarbok, 1873 og 1874	M. Mohn, Director.
	Report of the Permanent Committee of International Meteorological Congress at Vienna. 1874.	R. Scott, Director of the Meteorological Office, London.
28	Daily Weather Report, July to December, 1874	
June 2	Annuaire de l'Observatoire Royal de Bruxelles, 1874	A. Quetelet, Director.
	The Great Trigonometrical Survey of India. Vols. II and III.	Hon. Secretary for India, India Office, London.
	Bulletins de l'Académie Royale de Belgique, 2^{me} série, tomes 35, 36, 37.	I. Liagre, Secretary of the Academy.
	Annuaire de l'Académie Royale de Belgique, 1874	
	Statement and Exposition of Certain Harmonies of the Solar System.	Prof. S. Alexander, LL. D., Princeton, N. J.
10	Northwestern Wyoming and Yellowstone Park. Jones. 1873.	Gen. A. A. Humphreys, Chief of Engineers, U. S. A.
12	Circulars of Information, Bureau of Education. Nos. 1, 2	Gen. John Eaton, Chief of Bureau of Education.
14	Results of Meteorological Observations, New South Wales	H. C. Russell, Government Astronomer, New South Wales.
22	Report of Astronomer-Royal, &c., for June, 1875	Sir G. B. Airy, Astronomer-Royal, Greenwich.
July 16	Sull'eclissi solare totale del 3 Giugno 1239. Memoria di Giovanni Celoria.	G. Celoria, Director of the Observatory at Milan.

Date of receipt.	Title and Author.	To whom acknowledged.
1875. July 22	Memoirs of the Royal Astronomical Society. Part II, vol. XXXVII.	Secretary of the Royal Astronomical Society, London.
	La Comète de Coggia, observée à Bruxelles................	A. Quetelet, Director.
	Observations Météorologiques Simultanées sur l'Hémisphère Terrestre Boréal.	The same.
	Proceedings of the American Philosophical Society. Vol. XIV.	Secretary of the American Philosophical Society, Philadelphia.
	Monthly Notices of the Royal Society of Tasmania for 1873...	Secretary of the Royal Society, Tasmania.
	Annales de l'Observatoire de Moscow. Vol. II	Director of the Observatory of Moscow.
23	Transactions of the American Philosophical Society. Vol. XV, part ii.	The Secretary of the Philosophical Society, Philadelphia.
	Annales de l'Observatoire Physique Central de Russie, 1869, 1873.	Dr. H. Wild, Director, St. Petersburg.
	Meteorologische Beobachtungen: Dorpat, 1872–73..........	Dr A. M. Oettingen, Director, Dorpat.
	Annales Météorologiques de l'Observatoire Royal de Bruxelles, 1872–73.	A. Quetelet, Director.
	Observations des Phénomènes Périodiques, 1872	Société Royale, Académie de Belgique, Bruxelles.
Sept. 1	Sixth Annual Report of the Geological Survey of Indiana, 1875.	E. T. Cox, State Geologist.
	Minutes of Proceedings of the Institute of Civil Engineers, 1874–75. Parts II and III.	James Forrest, Secretary of the Institute of Civil Engineers, London.
	The Navigation of the Pacific Ocean........................	Com. Wyman, U. S. N., Superintendent of the Hydrographic Office.
27	Observations de Pulkova, publiées par Otto Struve, Directeur de l'Observatoire Central Nicolas. Vol. XXII: Observations au Cercle Méridien. 1873.	O. Struve, Director of the Imperial Observatory, St. Petersburg, Russia.
	Journal of the London Statistical Society. Vol. XXXVIII, pt. II, June, 1875.	J. Whittall, Assistant Secretary, London.
	Société des Arts et des Sciences à Batavia:—Tijdschrift, vols. XX, XXI; Notulen, vols. X, XI, 1873.—Codicum Arabicorum in Bibliotheca Societatis Artium et Scientiarum quæ Bataviæ floret asservatorum catalogum inchoatum a Doct. R. Friederrich absolvit indicibusque instruxit L. W. C. van den Berg.	The Secretary of the Society of Arts and Sciences, Batavia, Java.
28	Ueber den Doppelstern Σ 634=Camelopardali 19 Hevelii, von O. Struve 730. Dec. 1873. (Mélanges mathématiques et astronomiques.)	O. Struve, Director of the Imperial Observatory, St. Petersburg, Russia.
	Fortgesetzte Beobachtungen des Procyonbegleiters. Von O. Struve.	
	Ueber die Erzielung einer gleichmässigen Exposition bei photographischen Aufnahmen der Sonne. Von Dr. B. Hasselberg.	
	Abstracts and Results of the Magnetical and Meteorological Observations at the Magnetic Observatory, Toronto, Canada. 1841–71.	G. T. Kingston, Director of the Magnetic Observatory, Toronto, Canada.
	Supplement (No. 4) to the Seventh Annual Report of the Department of Marine and Fisheries for the fiscal year ending June 30, 1874; being reports on the meteorological, magnetic, and other observations of the Dominion of Canada for the year ending December 31, 1874. Ottawa, 1875.	
	Instructions in the use of Meteorological Instruments: compiled by direction of the Meteorological Committee, by Robert H. Scott, M. A., F. R. S., Director of the Meteorological Office. London, 1875. (Official copy.)	R. H. Scott, Director of the Meteorological Office, London.
Oct. 5	Schriften der naturforschenden Gesellschaft in Danzig. Neue Folge. Dritten Bandes, drittes Heft.	A. Menze, Secretär der naturforschenden Gesellschaft, Danzig.
	Schweizerische meteorologische Beobachtungen, October, November, December, 1873.	Prof. Dr. Rudolf Wolf, Zurich.
	Die Zeitbestimmung vermittelst des tragbaren Durchgangsinstruments im Verticale des Polarsterns. Von W. Döllen. Zweite Abhandlung.	Otto Struve, Director of the Pulkova Observatory.
	Die Polhöhe von Pulkowa. Von Dr. Magnus Nyrèn (Mémoires de l'Académie de St. Pétersbourg, vii^{me} série, tome xix.	
	Jahresbericht. Am 27. Mai 1874 dem Comite der Nicolai Hauptsternwarte abgestattet. Vom Director der Sternwarte.	
	Le Sfere Omocentriche di Eudosso, di Calippe, di Aristotele. Memoria di G. V. Schiaparelli.	Signor G. V. Schiaparelli, Milan.
	Détermination télégraphique de la différence de longitude entre la Station Astronomique du Simplon et les Observatoires de Milan et de Neuchâtel. E. Plantamour et A. Hirsch.	E. Plantamour and A. Hirsch, Geneva.
	Quarterly Weather Report of the Meteorological Office. October and December, 1873.	R. H. Scott, Director of the Meteorological Office, London.

Date of receipt.	Title and Author.	To whom acknowledged.
1875. Oct. 9	Anales del Observatorio de Marina de San Fernando por el Director Don Cecilio Pujazon, Capitan de Navio. Seccion 2^{a}, Observaciones Meteorologicas, 1873.	Don Cecilio Pujason, Director San Fernando.
	Observations made at the Magnetical and Meteorological Observatory at Batavia. Published by order of the Government of the Netherlands in India. Vol. I. Batavia, 1871.	Dr. P. A. Bergsma, Director of the Magnetical and Meteorological Observatory, Batavia, East Indies.
	Supplemento alla Meteorologia Italiana. Anno 1874–75. Fascicolo I, II.	Prof. Giov. Cantoni, Ministero di Agriculturà, Industria e Commercio, Roma.
	Astronomische Beobachtungen auf der grossherzoglichen Sternwarte zu Mannheim. Angestellt und herausgegeben von Dr. E. Schönfeld. Zweite Abtheilung, 1875.	Dr. E. Schönfeld, Mannheim.
	Sulle Variazioni periodiche e non periodiche della temperatura del clima de Milano. Giovanni Celoria. No. IV, Publicazioni del Reale Osservatorio di Brera, Milano.	G. V. Schiaparelli, Milan.
	Osservazioni Astronomiche diverse fatto nella Specola di Milano. Tempel. 1871–74.	
	Il Commodoro M. F. Maury e la Corrispondenza Meteorologica delle Alpi e degli Apennini Italiani pel P. F. Denza, Direttore dell'Osservatorio del Reale Collegio Carlo Alberto in Moncalieri. Torino, 1875.	P. F. Denza, Turin.
11	Meteorologische Beobachtungen angestellt in Dorpat im Jahre 1874. Professoren A. von Oettingen und K. Weihrauch. Neunter Jahrgang, II Band, Heft 4.	Profs. Oettingen and Weihrauch.
	Mittheilungen der königlich-geographischen-Gesellschaft in Wien, 1874. XVII Band. M. A. Becher. Wien 1874.	M. A. Becher, General Secretary, Vienna.
	Oversigt over det Köngelige Danske Videnskabernes Selskabs Forhandlinger og det Medlemmers Arbeider e Aaret 1874.	Secretary of the Royal Academy of Copenhagen.
	Proceedings of the Philosophical Society of Glasgow, 1874–75. Vol. IX, No. 2.	Sir William Thomson, President Glasgow Philosophical Society.
	Astronomische, magnetische, und meteorologische Beobachtungen an der kaiserlich-königlichen Sternwarte zu Prag im Jahre 1874. C. Hornstein, Director.	C. Hornstein, Director, Prague.
	Catalogue of Printed Books in the British Museum. Vol. I. 1874. 1 vol. 8vo.	Trustees of the British Museum, per Mr. J. Winter Jones, Principal Librarian.
	Books of Reference in the Reading Room of the British Museum. 2d edition, revised. 1871.	
	Catalogue of Maps, Prints, and Drawings, &c., in the British Museum attached to the Library of his late Majesty King George III. 2 vols. 8vo.	
	Catalogue of the Manuscript Maps, Charts, and Plans, and of the Topographical Drawings in the British Museum. 2 vols. 8vo. 1844.	
	Catalogus Codicum Manuscriptorum Orientalium qui in Museo Britannico asservantur: Pars Secunda Codices Arabicos amplectens. Partis II. Continuatio. Partis II. Supplementum. 3 vols. folio.	
	Inscriptions in the Hieratic and Demotic Character. Folio . .	
	Inscriptions in the Cuneiform Character from Assyrian Monuments discovered by A. H. Layard, D. C. L. 1852. Folio.	
	A Selection from the Miscellaneous Inscriptions. Major General Sir H. C. Rawlinson. Folio.	
	Inscriptions in the Himyaritic Character, discovered chiefly in Southern Arabia, and now in the British Museum. 1863.	
	Inscriptions in the Phenician Character, now deposited in the British Museum; discovered on the site of Carthage by N. Davis, Esq. 1863.	
	Synopsis of the Results of the Operations of the Great Trigonometrical Survey of India. Vol. II. The Great Arc, Section 24° to 30°. Vol. III. Kirachi Longitudinal Series.	Hon. Secretary of State for India, London.
22	Transactions of the Academy of Sciences, St. Louis. Vol. II, parts 1 and 2.	N. Holmes, Corresponding Secretary, St. Louis.
	Gulielmi Blaev Institutio Astronomica de usu Globorumatgue Sphærarum Celestium ac Terrestrium. Amstelodami, M.DC.LXVIII.	Mr. S. R. Seibert, Photographer, Washington, D. C.
	Anleitung zu wissenschaftlichen Beobachtungen auf Reisen Herausgegeben von Dr. G. Neumayer. Berlin, 1873.	
Nov. 5	Additions to the Catalogue of Books added to the Library of Congress during the year 1872.	A. R. Spofford, Librarian of Congress.
18	Report of the Commissioner of Education for the year 1874. .	Commissioner of Education.
23	Bibliotheca Mathematica et Physica. R. Friedlander	Dr. R. Friedlander, Berlin.
Dec. 14	British Nautical Almanac, 1879	Mr. J. R. Hind, Superintendent of the British Nautical Almanac.

Date of receipt.	Title and Author.	To whom acknowledged.
1875. Dec. 16	Abhandlungen der k. k. Akademie der Wissenschaften, Berlin. 4to. 1874.	Herr Kümmer, Secretary, Berlin.
	Terrestrial Magnetism of the Country of Orenburg, 1830–70. (Text in Russian.)	Col. A. C. Tillo, Imperial Observatory, St. Petersburg.
	Ueber eine Bestimmung der Sonnen-Parallaxe aus correspondirenden Beobachtungen des Planeten Flora. Von Dr. J. G. Galle, Professor, Breslau.	Dr. J. G. Galle, Breslau, Germany.
	Journal of the Statistical Society, London. September, 1875.	Mr. J. Whitall, Secretary, London.
17	Bolletino Meteorologico del Reale Osservatorio di Palermo. No. 8, vol. ix. Agosto 1873.	Director of the Royal Observatory, Palermo.
	Materyaly do Klimatografii Galicyi, Rok. 1874. Krakow, 1875.	Prof. Dr. Karlinski, Krakow.
	Schweizerische meteorologische Beobachtungen. April 1874. Supplementband, December 1873.	Prof. Dr. Rudolf Wolff, Zurich.
24	Observaciones magneticas y meteorologicas del Colegio de Belen de la Compañía de Jesus en la Habana. Año 1873. 4to.	Director of the Magnetic and Meteorological Observatory, Havana.
	Speculum Hartwellianum The Cycle of Celestial Objects continued at the Hartwell Observatory to 1859 by Vice Admiral W. H. Smyth. London.	Prof. F. A. Walker, Superintendent of the United States Census.

METEOROLOGICAL OBSERVATIONS

MADE AT THE

UNITED STATES NAVAL OBSERVATORY

DURING

THE YEAR 1875.

INTRODUCTION.

The meteorological department, during 1875, was under the charge of Prof. J. R. Eastman, U. S. N., who made a daily examination of all the records and a monthly inspection of all the instruments in use. The observations were made at 0^h, 3^h, 6^h, 9^h, 12^h, 15^h, 18^h, and 21^h, Washington civil time, by the Observatory watchmen, Messrs. T. Hays, D. Horrigan, and N. Cahill, who have acquired such a degree of skill as insures a reasonable accuracy in their work.

METEOROLOGICAL INSTRUMENTS.

Standard Barometer.—The barometer was made by James Green, of New York, and is only used as a standard by which the Newman barometer is occasionally tested. Drawings and a description of this instrument will be found in the volume of Washington Observations for 1862.

Newman Barometer.—This barometer in daily use was made by Newman, and is mounted against the northern wall of the northwest room on the first floor of the Observatory. The barometer is mounted with the usual adjustments at the top and bottom, and is attached by heavy brackets to a substantial mahogany board, which is firmly secured to the wall. The cistern is 103 feet above the mean half-tide of the Potomac River. The cistern and tube are of glass; the internal diameter of the former being 3.0 inches, and of the latter 0.532 inch.

The scale is attached to a brass rod having the usual adjustment to the surface of the mercury in the cistern. It is silvered and divided to 0.05 inch, and, by means of a vernier, may be read to 0.002 inch. The temperature of the mercury in the cistern is determined by a small ivory-scale thermometer, the bulb of which is constantly immersed in the mercury. The observations with this instrument in 1875, as printed in this volume, have received the constant correction of +0.005 inch, determined in 1864, and have also been reduced to 32°.0 Fahrenheit.

Dry-bulb Thermometer.—This is a mercurial thermometer by Green, with a bulb 1.5 inches long and 0.2 inch in diameter. The scale is of glass, 12.0 inches long, 0.8 inch wide, and 0.1 inch thick. It is divided to half-degrees from —30°.0 to +125°.0 Fahrenheit. Several independent tests, in the spring of 1868, indicated that the *freezing-point* had changed its position on the scale since 1863.

In 1871, the dry-bulb, the maximum, and the minimum thermometers were compared with the Kew standard thermometer, No. 462, belonging to Professor Eastman. No appreciable errors were detected in the maximum and minimum thermometers. A correction of —0°.9 was deduced for the dry-bulb thermometer; and each observation published in this volume has been corrected by this quantity.

Wet-bulb Thermometer.—This instrument is similar to the preceding in materials, construction, and dimensions. Its scale extends from —35°.0 to +115°.0 Fahrenheit. The bulb is covered with soft, fine linen, kept moist by the capillary action of a bundle of fine linen fibers that communicate with water in a bird-glass placed close beside it. The linen on the bulb is changed before its free action is impaired by dust.

Maximum Thermometer.—This is a mercurial thermometer, with a bulb 1.5 inches long and 0.2 inch in diameter. The scale is of glass, 12.0 inches long, 0.8 inch wide, and 0.1 inch thick, and is graduated to half-degrees from —50°.0 to +120°.0 Fahrenheit. At a point a short distance above the bulb, the internal diameter of the tube is so reduced that, while with the increase of temperature the mercury passes freely, with the least decrease of temperature the column of mercury is broken at the point of contraction if the instrument is nearly horizontal, and the top of the column marks the highest temperature

The top of the scale is attached by a metallic clamp to a pivot, around which the thermometer revolves freely in a vertical plane. This pivot is secured to a walnut board fixed to a post, about three feet above the ground; and the thermometer is placed nearly horizontal by resting the scale near the bulb on a wooden pin in the board.

After each observation, the instrument is adjusted by removing the pin and allowing the thermometer to swing freely from the pivot at the top of the scale, which motion is generally sufficient to reunite the column of mercury. In 1873, it was found that the readings from this thermometer required a correction of +0°.5, which has been applied to the observations of 1875.

Minimum Thermometer.—This is a transparent spirit-thermometer, with a spherical bulb about 0.5 inch in diameter. The scale is of silvered brass, 12 inches long, 1.0 inch wide, and 0.06 inch thick, and is graduated to degrees from —67°.0 to +131°.0 Fahrenheit. The registering index is a short, fine steel wire, inclosed in a delicate blue-glass cylinder, with a small knob at the extremity farthest from the bulb of the thermometer.

This cylinder is drawn toward the bulb by the decrease of temperature; but when the temperature increases, the spirit flows through and around the cylinder, which remains at rest at the lowest point reached by the liquid. The end of the knob on the cylinder indicates the lowest point reached by the column of liquid. After each observation, the index is moved to the top of the column by means of a small magnet.

Solar Thermometer.—This thermometer (No. 13583) was made by L. Casella, of London, and consists of a blackened spherical bulb and its tube, inclosed within a bulb and cylinder of glass of the same form as the thermometer, but of about three times the diameter. The air has been exhausted from the inclosing bulb and cylinder, and the thermometer is confined in the center of the cylinder by having its upper end sealed to the end of the cylinder, while the lower end is fixed in a cork collar just above the junction of the bulb and cylinder. The scale is engraved on the thermometer-tube to degrees, and has a range from —10°.0 to +215°.0 Fahrenheit.

At about 20° from the top of the column of mercury, a small portion of air (covering about 0°.5 on the scale) is introduced into the column, so that whenever the temperature diminishes, the column of mercury above the air remains in position, indicating the highest temperature subsequent to the last observation. After each observation, the instrument is adjusted by holding it in a vertical position, tapping it gently, if necessary, until the upper portion forces the air down to the main column.

This thermometer rests in a horizontal position, in metallic crutches, 3 inches high, which are attached to an inch board 16 inches long and 5 inches wide. The board is painted green, and placed on the grass about three yards west of the Meteorological Observatory.

METEOROLOGICAL OBSERVATORY.

In 1862, a small building for the special protection of thermometers was erected about four yards southwest of the southwest corner of the south wing of the Observatory. It is constructed of wood, and painted white throughout.

Its form is octagonal, each side being 2.4 feet wide and 6.3 feet high to the eaves. The roof is of tin, unpainted on the under side. The ceiling is of thick boards, tightly fitted together, and between it and the roof there is an open space freely communicating with the open air.

On the north side is the door, which, as well as the sides, is of double louver-work, with a space of three inches between the two divisions. The sides terminate one foot from the ground, and, as the building is situated on a grass-plat, under ordinary circumstances the instrument should indicate the true temperature. This building was moved on April 9, 1874, to a point 18.8 yards west of the south wing of the main building and 17.3 yards south of the Transit Circle room.

The dry-, wet-bulb, maximum, and minimum thermometers are in the Meteorological Observatory, and are all supported by means of arms and brackets to an upright metallic shaft, which is firmly secured to the ground in the center of the building.

The bulb of the minimum thermometer is 5.8 feet, those of the dry- and the wet-bulb thermometers are 4.2 feet, and that of the maximum thermometer is 3.2 feet above the ground.

A standard thermometer (Troughton and Simms, No. 1) is suspended between the dry- and the wet-bulb thermometers, and is frequently used as a check on the other instruments.

From frequent comparisons, it has been ascertained that the errors of the minimum and wet-bulb thermometers are not appreciable, and therefore the published observations with these instruments are the unmodified copies of the original records.

The maximum and minimum thermometers were read at the end (midnight) of each day.

DIRECTION AND FORCE OF THE WIND.

An ordinary wind-vane revolves freely on a spindle at the top of the time-ball staff, and the direction of the wind is estimated from the known azimuths of the lines of the main building of the Observatory. The velocity of the wind is recorded in numerals, of which 0 indicates a calm, 1 a very slight breeze, and so on up to 10, which would indicate a violent hurricane.

These recorded numbers are only estimates, and at best are but approximative.

CLOUDS.

In the description of the prevailing forms of clouds, the nomenclature of Howard is used: C., K., S., N., being the symbols for the forms designated *cirrus*, *cumulus*, *stratus*, *nimbus;* and the letters C. S., C. K., &c., indicate the combination *cirro-stratus*, *cirro-cumulus*, &c. The portion of sky obscured is determined by estimation after a careful scrutiny of the clouds or sky. A clear sky is denoted by 0, and a total obscuration by 10.

RAIN-GAUGE.

This instrument is placed within the inclosure for the protection of the solar thermometer. It consists of a cylinder 0.8 inch long and 4.1 inches in diameter, soldered to an inverted cone, which is loaded with lead on the outside and near the apex.

The cone rests in an aperture in the horizontal top of an oblong box, and this, aided by the weight of the lead, prevents any disturbance, even during high winds. The top of the gauge is 2.0 feet above the ground, and is free from all shelter, even in driving rain-storms.

At the apex of the cone is a small aperture, through which the water passes to a receiving-bottle in the box.

The rain is measured in a glass cylinder, with an internal diameter of 0.60 inch, so graduated that the depth of rain can be determined to within 0.002 inch.

The gauge is examined every day, and, as the apex of the cone closes the mouth of the bottle except through the small aperture, there is little or no loss by evaporation.

Each inch of snow is assumed to be equal to 0.111 inch of rain; but, whenever practicable, the snow has been melted, and measured in the graduated cylinder.

OBSERVATIONS.

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
January 1	30.700	30.672	30.634	30.687	30.601	30.523	30.410	30.390
2	30.259	30.094	29.894	29.808	29.694	29.746	29.922	30.010
3	30.064	30.125	30.157	30.233	30.184	30.135	30.141	30.105
4	30.041	30.035	29.975	30.014	29.975	29.963	30.033	30.057
5	30.065	30.088	30.099	30.171	30.177	30.218	30.295	30.391
6	30.436	30.454	30.484	30.525	30.453	30.400	30.359	30.314
7	30.253	30.183	30.136	30.112	29.991	29.918	29.886	29.857
8	29.884	29.982	30.082	30.222	30.207	30.213	30.201	30.157
9	30.091	30.048	29.979	29.968	29.945	30.025	30.193	30.319
10	30.372	30.440	30.477	30.530	30.479	30.434	30.450	30.421
11	30.382	30.374	30.361	30.379	30.337	30.307	30.355	30.361
12	30.353	30.376	30.382	30.411	30.342	30.297	30.287	30.234
13	30.171	30.106	30.040	30.043	29.968	29.962	29.910	29.914
14	29.956	30.032	30.120	30.145	30.115	30.102	30.144	30.129
15	30.160	30.263	30.362	30.414	30.367	30.370	30.350	30.322
16	30.305	30.282	30.203	30.192	30.087	30.072	30.103	30.161
17	30.210	30.295	30.347	30.412	30.386	30.358	30.375	30.359
18	30.315	30.257	30.197	30.161	30.028	30.009	30.036	30.113
19	30.170	30.223	30.240	30.318	30.305	30.275	30.297	30.311
20	30.329	30.372	30.397	30.458	30.435	30.400	30.435	30.442
21	30.407	30.387	30.335	30.314	30.166	30.081	29.994	29.964
22	29.896	29.824	29.770	29.814	29.870	29.900	29.970	30.030
23	30.123	30.228	30.308	30.400	30.400	30.373	30.389	30.412
24	30.368	30.315	30.220	30.147	29.984	29.861	29.820	29.882
25	29.901	29.955	30.036	30.126	30.120	30.120	30.191	30.242
26	30.271	30.317	30.351	30.386	30.340	30.200	30.311	30.309
27	30.268	30.266	30.239	30.231	30.131	30.060	30.055	30.036
28	29.977	29.955	29.921	29.893	29.794	29.711	29.670	29.672
29	29.654	29.638	29.619	29.617	29.600	29.546	29.578	29.607
30	29.637	29.685	29.754	29.853	29.872	29.880	29.911	29.951
31	29.949	29.914	29.844	29.834	29.773	29.716	29.738	29.788
Hourly means.	30.160	30.167	30.160	30.188	30.133	30.102	30.123	30.137

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
February 1	29.831	29.954	30.060	30.144	30.165	30.157	30.192	30.222
2	30.247	30.258	30.288	30.289	30.254	30.187	30.164	30.135
3	30.062	29.954	29.844	29.733	29.627	29.526	29.482	29.566
4	29.658	29.758	29.870	29.974	30.010	30.037	30.150	30.255
5	30.345	30.408	30.454	30.508	30.482	30.430	30.408	30.376
6	30.328	30.299	30.279	30.284	30.269	30.260	30.307	30.355
7	30.394	30.391	30.389	30.374	30.274	30.156	30.107	30.062
8	30.021	29.992	29.964	29.986	29.956	29.907	29.944	29.980
9	29.998	30.049	30.071	30.175	30.267	30.312	30.392	30.483
10	30.524	30.587	30.586	30.621	30.596	30.507	30.431	30.370
11	30.282	30.152	29.975	29.818	29.707	29.685	29.738	29.814
12	29.896	30.008	30.074	30.134	30.082	30.048	30.015	29.987
13	29.984	30.021	30.032	30.084	30.057	30.008	30.006	29.997
14	29.967	29.918	29.920	29.954	29.930	29.894	29.997	30.082
15	30.155	30.165	30.188	30.244	30.200	30.159	30.202	30.274
16	30.308	30.313	30.315	30.343	30.295	30.241	30.237	30.255
17	30.227	30.164	30.119	30.059	29.934	29.880	29.972	30.069
18	30.154	30.207	30.240	30.302	30.259	30.225	30.178	30.165
19	30.126	30.055	30.003	29.972	29.891	29.799	29.732	29.685
20	29.629	29.533	29.449	29.405	29.397	29.380	29.434	29.560
21	29.677	29.768	29.854	29.934	29.988	29.972	30.050	30.153
22	30.175	30.205	30.264	30.301	30.276	30.170	30.159	30.161
23	30.132	30.111	30.103	30.134	30.074	30.046	30.010	29.960
24	29.926	29.866	29.826	29.824	29.826	29.805	29.842	29.846
25	29.830	29.770	29.640	29.617	29.543	29.412	29.396	29.588
26	29.824	29.928	29.980	30.020	29.987	29.927	29.890	29.898
27	29.837	29.814	29.716	29.664	29.629	29.648	29.801	29.881
28	29.941	30.053	30.123	30.218	30.265	30.255	30.270	30.295
Hourly means.	30.053	30.061	30.058	30.076	30.044	30.001	30.018	30.053

Mean Time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
March 1	30.271	30.265	30.259	30.151	29.998	29.873	29.775	29.704
2	29.635	29.661	29.686	29.783	29.868	29.927	30.033	30.098
3	30.158	30.163	30.150	30.033	29.903	29.769	29.701	29.791
4	29.857	30.004	30.061	30.187	30.226	30.276	30.257	30.268
5	30.293	30.296	30.259	30.247	30.249	30.171	30.142	30.107
6	30.054	30.035	30.007	29.998	29.961	29.936	29.954	29.986
7	29.955	29.941	29.878	29.854	29.741	29.560	29.390	29.368
8	29.376	29.514	29.681	29.816	29.958	30.013	30.042	30.102
9	30.123	30.119	30.116	30.131	30.067	30.004	29.966	29.955
10	29.887	29.846	29.865	29.886	29.858	29.839	29.881	29.911
11	29.947	29.961	30.026	30.087	30.063	29.974	29.914	29.838
12	29.817	29.836	29.878	29.922	29.925	29.881	29.911	29.932
13	29.906	29.819	29.832	29.851	29.865	29.888	29.930	30.024
14	30.064	30.088	30.149	30.128	30.082	29.980	29.950	29.906
15	29.836	29.766	29.772	29.674	29.576	29.457	29.456	29.448
16	29.466	29.498	29.580	29.617	29.569	29.509	29.540	29.610
17	29.608	29.592	29.624	29.641	29.740	29.782	29.932	30.033
18	30.052	30.094	30.161	30.201	30.206	30.196	30.230	30.245
19	30.244	30.228	30.254	30.219	30.161	30.116	30.086	30.057
20	29.985	29.836	29.705	29.646	29.587	29.447	29.569	29.692
21	29.706	29.762	29.827	29.914	29.928	29.949	29.993	30.048
22	30.065	30.111	30.153	30.186	30.174	30.155	30.183	30.241
23	30.298	30.312	30.375	30.402	30.372	30.319	30.293	30.303
24	30.287	30.238	30.119	30.049	29.942	29.831	29.845	29.908
25	29.993	30.074	30.144	30.097	30.207	30.231	30.260	30.304
26	30.319	30.282	30.254	30.196	30.062	29.884	29.850	29.835
27	29.840	29.886	29.970	29.999	29.993	29.948	29.977	30.028
28	30.057	30.126	30.200	30.268	30.242	30.199	30.235	30.246
29	30.266	30.205	30.289	30.295	30.293	30.231	30.266	30.299
30	30.299	30.288	30.301	30.319	30.305	30.275	30.265	30.303
31	30.288	30.283	30.316	30.346	30.320	30.263	30.259	30.305
Hourly means.	29.998	30.004	30.029	30.037	30.014	29.964	29.970	29.997

Mean Time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
April 1	30.271	30.249	30.259	30.252	30.192	30.095	30.068	30.066
2	30.037	29.988	29.991	29.980	29.891	29.808	29.832	29.830
3	29.878	29.900	29.976	30.030	30.002	29.964	29.970	30.003
4	29.873	29.958	29.991	30.028	29.998	29.954	29.965	30.003
5	30.022	30.027	30.134	30.189	30.181	30.159	30.192	30.229
6	30.252	30.288	30.305	30.329	30.257	30.171	30.130	30.148
7	30.156	30.096	30.113	30.168	30.185	30.200	30.268	30.319
8	30.315	30.278	30.275	30.249	30.171	30.066	30.030	30.027
9	30.055	29.991	29.996	30.004	30.015	29.981	29.964	29.964
10	29.960	29.950	30.007	30.026	29.973	29.952	29.944	29.941
11	29.925	29.891	29.865	29.877	29.814	29.778	29.788	29.788
12	29.754	29.769	29.790	29.816	29.818	29.796	29.795	29.896
13	29.734	29.711	29.694	29.670	29.636	29.603	29.616	29.655
14	29.698	29.759	29.824	29.860	29.870	29.845	29.848	29.910
15	29.900	29.814	29.836	29.846	29.757	29.655	29.596	29.591
16	29.580	29.564	29.550	29.534	29.509	29.526	29.616	29.736
17	29.782	29.782	29.809	29.815	29.788	29.732	29.745	29.806
18	29.791	29.744	29.753	29.771	29.775	29.799	29.859	29.923
19	29.919	29.909	29.907	29.916	29.860	29.749	29.742	29.844
20	29.689	29.725	29.759	29.820	29.822	29.811	29.821	29.878
21	29.897	29.902	29.941	29.980	29.954	29.891	29.910	29.964
22	29.990	29.995	30.007	30.020	29.979	29.922	29.896	29.946
23	29.917	29.902	29.895	29.868	29.788	29.675	29.668	29.688
24	29.678	29.605	29.599	29.578	29.514	29.602	29.659	29.776
25	29.808	29.818	29.900	29.972	29.977	29.980	30.032	30.094
26	30.124	30.118	30.147	30.128	30.053	30.004	29.893	29.996
27	29.996	29.996	29.981	29.978	29.925	29.856	29.789	29.734
28	29.653	29.581	29.530	29.541	29.570	29.618	29.743	29.818
29	29.852	29.856	29.922	29.920	29.875	29.736	29.655	29.619
30	29.650	29.692	29.798	29.812	29.778	29.736	29.777	29.840
Hourly means.	29.905	29.895	29.918	29.933	29.898	29.855	29.860	29.901

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
May 1	29.866	29.881	29.905	29.886	29.791	29.644	29.490	29.420
2	29.384	29.447	29.490	29.645	29.705	29.732	29.775	29.849
3	29.919	29.912	29.951	30.001	29.951	29.840	29.814	29.796
4	29.768	29.595	29.621	29.634	29.689	29.737	29.772	29.839
5	29.889	29.922	29.946	29.997	29.959	29.892	29.846	29.848
6	29.819	29.726	29.719	29.702	29.679	29.656	29.698	29.774
7	29.800	29.795	29.895	29.972	29.965	29.950	29.974	30.024
8	30.024	29.968	29.984	29.960	29.874	29.864	29.770	29.781
9	29.777	29.773	29.807	29.834	29.759	29.657	29.597	29.575
10	29.535	29.512	29.575	29.649	29.736	29.756	29.789	29.877
11	29.917	29.915	30.006	30.049	29.998	29.946	29.893	29.886
12	29.831	29.771	29.754	29.723	29.694	29.744	29.848	29.933
13	29.984	30.047	30.083	30.151	30.146	30.110	30.094	30.122
14	30.126	30.134	30.156	30.167	30.106	30.042	29.998	29.991
15	29.852	29.902	29.927	29.956	29.928	29.938	30.022	30.086
16	30.138	30.148	30.189	30.199	30.162	30.111	30.113	30.167
17	30.208	30.219	30.248	30.294	30.213	30.145	30.121	30.123
18	30.118	30.075	30.100	30.119	30.074	30.074	30.055	30.085
19	30.062	30.047	30.070	30.065	30.009	29.992	29.996	30.008
20	30.004	29.989	30.015	30.006	29.956	29.888	29.873	29.927
21	29.966	29.929	29.968	29.968	29.930	29.872	29.829	29.850
22	29.843	29.859	29.892	29.903	29.880	29.826	29.821	29.844
23	29.859	29.852	29.868	29.886	29.868	29.812	29.796	29.837
24	29.844	29.848	29.872	29.883	29.856	29.810	29.780	29.780
25	29.760	29.687	29.686	29.686	29.665	29.614	29.611	29.654
26	29.682	29.693	29.748	29.786	29.804	29.807	29.825	29.877
27	29.942	30.010	30.058	30.111	30.129	30.114	30.107	30.115
28	30.141	30.159	30.167	30.159	30.108	30.060	30.020	29.998
29	29.954	29.917	29.904	29.900	29.843	29.768	29.819	29.854
30	29.897	29.934	29.993	30.020	29.979	29.936	29.933	29.939
31	29.951	29.983	30.011	30.043	29.988	29.943	29.960	29.984
Hourly means.	29.899	29.892	29.923	29.947	29.918	29.880	29.872	29.898

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
June 1	30.002	30.006	30.028	30.064	30.046	30.018	30.023	30.073
2	30.090	30.073	30.094	30.107	30.083	30.052	30.035	30.034
3	30.064	30.044	30.044	30.055	30.061	30.026	30.023	30.061
4	30.061	30.063	30.113	30.158	30.129	30.096	30.078	30.099
5	30.116	30.101	30.111	30.087	30.038	29.952	29.900	29.935
6	29.909	29.885	29.902	29.893	29.886	29.850	29.808	29.800
7	29.742	29.703	29.690	29.574	29.688	29.749	29.813	29.891
8	29.919	29.944	29.990	30.054	30.046	30.035	30.043	30.054
9	30.054	30.054	30.059	30.065	30.055	30.017	29.994	30.025
10	30.004	29.992	30.026	30.015	29.995	29.973	29.974	30.000
11	30.019	30.022	30.065	30.073	30.051	29.996	29.986	29.990
12	29.969	29.920	29.912	29.894	29.901	29.838	29.794	29.796
13	29.821	29.864	29.946	30.023	30.020	29.977	29.975	30.002
14	30.029	30.040	30.057	30.100	30.037	29.960	29.921	29.930
15	29.934	29.918	29.918	29.935	29.901	29.858	29.831	29.814
16	29.796	29.737	29.777	29.813	29.830	29.824	29.826	29.851
17	29.876	29.824	29.912	29.934	29.910	29.830	29.800	29.816
18	29.817	29.744	29.748	29.758	29.754	29.791	29.846	29.880
19	29.880	29 915	29.914	29.973	29.970	29.933	29.933	29.986
20	30.013	30.049	30.079	30.118	30.137	30.094	30.076	30.100
21	30.099	30.090	30.098	30.106	30.070	30.018	29.989	30.011
22	29.990	29.969	29.980	29.971	29.924	29.871	29.860	29.875
23	29.852	29.834	29.873	29.890	29.893	29.870	29.852	29.883
24	29.884	29.898	29.943	29.972	29.944	29.908	29.875	29.882
25	29.887	29.880	29.916	29.930	29.901	29.854	29.895	29.906
26	29.906	29.883	29.911	29.927	29.903	29.881	29.830	29.859
27	29.856	29.861	29.882	29.898	29.863	29.804	29.822	29.827
28	29.814	29.798	29.826	29.847	29.859	29.834	29.860	29.905
29	29.917	29.932	29.965	29.972	29.944	29.940	29.891	29.983
30	29.965	29.975	30.010	30.020	30.034	29.988	30.012	30.020
Hourly means.	29.943	29.934	29.960	29.974	29.962	29.927	29.919	29.944

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
July 1	30.032	30.016	30.042	30.070	30.037	30.007	30.017	30.052
2	30.067	30.072	30.119	30.126	30.109	30.041	30.019	30.049
3	30.017	30.017	30.040	30.035	30.026	30.001	29.993	30.018
4	30.017	30.007	30.014	30.028	30.010	29.963	29.943	29.982
5	29.988	30.007	30.035	30.051	30.043	29.998	29.977	30.002
6	30.008	29.992	30.015	30.017	29.987	29.943	29.946	29.984
7	29.985	29.987	30.012	30.034	30.049	30.021	30.027	30.060
8	30.083	30.100	30.139	30.177	30.161	30.160	30.119	30.133
9	30.127	30.113	30.122	30.118	30.070	30.021	29.974	29.952
10	29.931	29.878	29.859	29.838	29.794	29.745	29.746	29.748
11	29.713	29.734	29.760	29.803	29.802	29.775	29.796	29.828
12	29.842	29.850	29.875	29.895	29.873	29.835	29.833	29.828
13	29.841	29.821	29.822	29.838	29.789	29.747	29.714	29.730
14	29.743	29.732	29.750	29.770	29.763	29.735	29.714	29.743
15	29.728	29.720	29.746	29.772	29.734	29.677	29.646	29.652
16	29.606	29.593	29.630	29.662	29.694	29.656	29.659	29.712
17	29.701	29.712	29.751	29.824	29.793	29.776	29.783	29.667
18	29.793	29.752	29.727	29.693	29.663	29.685	29.766	29.862
19	29.942	29.996	30.057	30.108	30.094	30.050	30.025	30.056
20	30.054	30.010	30.037	30.006	29.983	29.940	29.876	29.875
21	29.858	29.808	29.842	29.836	29.818	29.808	29.819	29.852
22	29.870	29.876	29.896	29.902	29.854	29.852	29.809	29.775
23	29.742	29.684	29.732	29.767	29.799	29.782	29.802	29.837
24	29.851	29.863	29.923	29.950	29.979	29.975	29.979	30.015
25	30.039	30.053	30.083	30.119	30.091	30.055	30.043	30.068
26	30.041	30.040	30.050	30.055	30.041	29.992	29.977	30.026
27	30.017	29.979	29.995	30.004	29.962	29.962	29.897	29.920
28	29.872	29.848	29.847	29.875	29.902	29.896	29.876	29.903
29	29.905	29.877	29.871	29.854	29.796	29.757	29.752	29.819
30	29.864	29.867	29.917	29.934	29.942	29.900	29.904	29.911
31	29.935	29.946	29.962	29.997	30.002	29.998	29.968	29.998
Hourly means.	29.910	29.902	29.925	29.941	29.925	29.895	29.884	29.905

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
August 1	30.003	30.022	30.035	30.078	30.076	30.023	30.020	30.012
2	29.976	29.928	29.948	29.957	29.965	29.964	29.964	29.982
3	29.954	29.945	29.968	30.021	30.021	30.002	30.001	29.993
4	30.018	30.003	30.011	30.013	29.995	29.946	29.919	29.934
5	29.919	29.914	29.915	29.932	29.916	29.883	29.863	29.879
6	29.876	29.846	29.851	29.848	29.810	29.753	29.704	29.735
7	29.756	29.768	29.873	29.799	29.802	29.777	29.802	29.860
8	29.882	29.879	29.902	29.933	29.910	29.885	29.893	29.946
9	29.944	29.939	29.960	29.955	29.934	29.898	29.894	29.914
10	29.916	29.894	29.910	29.922	29.887	29.837	29.820	29.828
11	29.818	29.823	29.827	29.936	29.832	29.800	29.800	29.853
12	29.832	29.860	29.880	29.888	29.857	29.821	29.821	29.864
13	29.871	29.867	29.894	29.895	29.898	29.864	29.859	29.885
14	29.871	29.874	29.900	29.910	29.917	29.886	29.876	29.901
15	29.886	29.853	29.883	29.893	29.872	29.833	29.807	29.828
16	29.810	29.790	29.789	29.814	29.804	29.764	29.761	29.803
17	29.785	29.777	29.792	29.816	29.802	29.767	29.750	29.770
18	29.730	29.689	29.698	29.718	29.696	29.662	29.694	29.728
19	29.718	29.718	29.743	29.775	29.789	29.754	29.768	29.820
20	29.845	29.862	29.886	29.932	29.930	29.913	29.920	29.969
21	29.996	30.027	30.069	30.127	30.120	30.090	30.068	30.087
22	30.099	30.087	30.100	30.104	30.088	30.048	30.064	30.089
23	30.089	30.083	30.123	30.163	30.160	30.173	30.175	30.191
24	30.183	30.158	30.176	30.206	30.223	30.192	30.206	30.221
25	30.195	30.168	30.195	30.220	30.206	30.164	30.146	30.153
26	30.135	30.112	30.141	30.170	30.126	30.108	30.084	30.106
27	30.120	30.114	30.111	30.142	30.123	30.089	30.077	30.114
28	30.081	30.062	30.076	30.088	30.078	30.044	30.025	30.050
29	30.007	29.987	30.011	30.091	29.955	29.965	29.909	29.935
30	29.903	29.891	29.890	29.898	29.877	29.838	29.834	29.852
31	29.857	29.852	29.894	29.927	29.922	29.897	29.914	29.961
Hourly means.	29.938	29.929	29.950	29.973	29.955	29.924	29.917	29.941

Mean Time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
September 1	29.995	30.004	30.048	30.063	30.040	30.010	29.998	30.030
2	30.033	30.009	30.013	29.986	29.955	29.889	29.870	29.883
3	29.868	29.842	29.876	29.875	29.835	29.794	29.764	29.783
4	29.744	29.719	29.738	29.743	29.727	29.697	29.719	29.776
5	29.815	29.862	29.913	29.965	29.946	29.917	29.894	29.900
6	29.897	29.849	29.872	29.880	29.847	29.805	29.809	29.874
7	29.916	29.954	29.988	30.036	30.008	29.960	29.979	30.010
8	30.020	30.047	30.070	30.110	30.097	30.055	30.058	30.088
9	30.120	30.108	30.144	30.145	30.126	30.055	30.028	30.020
10	29.980	29.932	29.883	29.836	29.772	29.758	29.922	30.026
11	30.116	30.213	30.240	30.295	30.278	30.248	30.247	30.277
12	30.293	30.272	30.279	30.277	30.250	30.195	30.191	30.197
13	30.177	30.169	30.193	30.220	30.215	30.192	30.207	30.246
14	30.248	30.250	30.260	30.278	30.251	30.202	30.162	30.140
15	30.120	30.105	30.092	30.074	30.019	29.944	29.896	29.881
16	29.869	29.831	29.804	29.785	29.723	29.644	29.577	29.595
17	29.633	29.625	29.655	29.680	29.683	29.691	29.774	29.858
18	29.935	29.935	30.005	30.015	29.980	29.922	29.867	29.857
19	29.748	29.610	29.566	29.575	29.591	29.606	29.651	29.710
20	29.724	29.712	29.750	29.788	29.786	29.796	29.864	29.930
21	29.980	30.010	30.048	30.086	30.072	30.069	30.062	30.100
22	30.115	30.137	30.187	30.213	30.181	30.175	30.178	30.224
23	30.234	30.255	30.280	30.302	30.285	30.268	30.274	30.298
24	30.306	30.301	30.315	30.322	30.285	30.250	30.205	30.222
25	30.196	30.153	30.132	30.160	30.078	29.960	29.902	29.873
26	29.765	29.701	29.757	29.821	29.836	29.843	29.912	29.956
27	29.975	30.006	30.018	30.020	29.984	29.918	29.916	29.928
28	29.934	29.955	29.982	30.012	29.996	29.969	29.991	30.007
29	29.985	29.951	29.946	29.964	29.936	29.859	29.846	29.845
30	29.784	29.712	29.689	29.689	29.634	29.597	29.592	29.630
Hourly means.	29.984	29.974	29.991	30.007	29.981	29.943	29.945	29.972

Mean Time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
October 1	29.587	29.553	29.513	29.472	29.490	29.526	29.627	29.739
2	29.936	30.036	30.102	30.191	30.203	30.197	30.264	30.326
3	30.357	30.379	30.423	30.451	30.402	30.315	30.282	30.278
4	30.186	30.172	30.159	30.147	30.049	29.988	29.957	29.958
5	29.947	29.949	29.952	29.988	29.956	29.939	29.964	30.006
6	30.008	29.985	29.988	30.007	29.949	29.858	29.869	29.854
7	29.810	29.808	29.891	29.992	29.951	29.930	29.958	30.004
8	30.002	30.002	30.015	30.028	29.990	29.934	29.957	30.019
9	30.060	30.068	30.099	30.131	30.100	30.034	30.007	29.994
10	29.944	29.902	29.862	29.852	29.799	29.729	29.697	29.738
11	29.722	29.728	29.838	29.937	29.935	29.952	29.992	30.033
12	30.048	30.098	30.149	30.208	30.224	30.236	30.279	30.340
13	30.364	30.379	30.399	30.443	30.401	30.325	30.317	30.325
14	30.279	30.244	30.221	30.237	30.138	30.063	30.027	29.998
15	29.778	29.767	29.757	29.726	29.669	29.595	29.586	29.600
16	29.577	29.530	29.474	29.469	29.482	29.505	29.641	29.699
17	29.766	29.862	29.965	30.006	29.965	29.928	29.912	29.907
18	29.871	29.849	29.849	29.862	29.856	29.838	29.912	29.983
19	30.030	30.039	30.103	30.150	30.139	30.129	30.148	30.174
20	30.170	30.161	30.185	30.206	30.160	30.097	30.066	30.056
21	30.038	29.998	29.999	30.015	29.935	29.869	29.883	29.908
22	29.944	29.953	29.986	30.014	29.982	29.924	29.928	29.950
23	29.940	29.926	29.910	29.933	29.878	29.836	29.810	29.806
24	29.783	29.738	29.731	29.752	29.718	29.690	29.708	29.745
25	29.760	29.766	29.794	29.856	29.835	29.802	29.841	29.871
26	29.851	29.857	29.881	29.856	29.744	29.613	29.574	29.562
27	29.710	29.724	29.706	29.745	29.736	29.790	29.901	29.973
28	30.025	30.066	30.117	30.154	30.081	30.004	29.977	29.935
29	29.889	29.891	29.902	29.930	29.878	29.826	29.814	29.810
30	29.777	29.731	29.701	29.649	29.486	29.486	29.539	29.619
31	29.689	29.705	29.750	29.785	29.791	29.812	29.763	29.890
Hourly means.	29.931	29.931	29.949	29.974	29.933	29.896	29.910	29.939

Mean Time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
November 1	29.881	29.932	29.956	29.959	29.887	29.838	29.810	29.814
2	29.804	29.840	29.899	29.976	29.944	29.953	30.000	30.046
3	30.055	30.061	30.065	30.067	30.006	29.912	29.851	29.801
4	29.715	29.660	29.591	29.625	29.648	29.702	29.810	29.863
5	29.875	29.913	29.933	29.960	29.957	29.901	29.953	29.888
6	30.013	30.032	30.098	30.147	30.140	30.097	30.115	30.125
7	30.110	30.105	30.111	30.127	30.083	30.038	30.008	30.025
8	30.005	29.992	30.038	30.082	30.059	30.064	30.130	30.162
9	30.201	30.225	30.236	30.288	30.240	30.197	30.169	30.144
10	30.079	29.955	29.884	29.836	29.649	29.639	29.644	29.678
11	29.726	29.786	29.848	29.946	29.943	29.934	29.961	30.004
12	30.016	30.033	30.050	30.083	30.021	29.954	29.964	29.951
13	29.938	29.937	29.940	29.964	29.870	29.811	29.816	29.765
14	29.724	29.671	29.515	29.545	29.490	29.488	29.540	29.576
15	29.590	29.593	29.634	29.670	29.624	29.572	29.650	29.670
16	29.666	29.666	29.662	29.601	29.558	29.572	29.697	29.801
17	29.893	29.941	30.004	30.129	30.139	30.163	30.244	30.292
18	30.302	30.311	30.331	30.318	30.213	30.126	30.103	30.002
19	29.935	29.857	29.849	29.792	29.742	29.799	29.756	29.780
20	29.795	29.794	29.821	29.938	29.954	29.974	30.026	30.050
21	30.050	30.032	30.012	30.056	30.024	30.056	30.162	30.250
22	30.347	30.400	30.469	30.571	30.567	30.575	30.592	30.600
23	30.570	30.486	30.414	30.306	30.189	30.092	30.038	29.982
24	29.910	29.925	30.056	30.187	30.205	30.262	30.251	30.407
25	30.424	30.492	30.510	30.566	30.536	30.481	30.466	30.436
26	30.372	30.312	30.210	30.159	30.044	29.955	29.912	29.913
27	29.940	29.995	30.051	30.147	30.190	30.220	30.293	30.341
28	30.359	30.349	30.332	30.319	30.237	30.174	30.113	30.004
29	29.930	29.906	29.899	29.958	30.005	30.042	30.136	30.241
30	30.270	30.300	30.316	30.360	30.305	30.257	30.278	30.292
Hourly means.	30.016	30.017	30.024	30.056	30.016	29.995	30.016	30.030

Mean time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
December 1	30.238	30.220	30.172	30.196	30.149	30.128	30.126	30.196
2	30.234	30.252	30.389	30.401	30.409	30.401	30.428	30.440
3	30.454	30.416	30.402	30.439	30.386	30.350	30.320	30.282
4	30.234	30.194	30.165	30.168	30.119	30.057	30.060	30.044
5	30.016	29.972	29.922	29.919	29.832	29.711	29.672	29.623
6	29.584	29.601	29.604	29.675	29.670	29.684	29.719	29.715
7	29.718	29.681	29.650	29.625	29.541	29.445	29.379	29.351
8	29.348	29.351	29.363	29.428	29.432	29.450	29.506	29.551
9	29.566	29.586	29.604	29.650	29.667	29.680	29.766	29.791
10	29.818	29.865	29.915	30.000	29.994	30.007	30.041	30.051
11	30.029	30.002	29.976	29.939	29.826	29.784	29.709	29.690
12	29.657	29.671	29.687	29.716	29.669	29.661	29.672	29.612
13	29.524	29.448	29.441	29.459	29.456	29.488	29.594	29.617
14	29.643	29.650	29.660	29.710	29.720	29.766	29.855	29.902
15	29.917	29.924	29.937	29.938	29.832	29.727	29.694	29.670
16	29.687	29.752	29.806	29.850	29.785	29.707	29.628	29.604
17	29.625	29.644	29.649	29.723	29.772	29.844	29.942	29.979
18	29.992	29.997	30.008	30.061	30.039	29.996	30.012	30.044
19	30.102	30.136	30.185	30.254	30.252	30.286	30.363	30.542
20	30.505	30.543	30.563	30.600	30.545	30.470	30.440	30.416
21	30.383	30.363	30.343	30.355	30.283	30.205	30.141	30.091
22	29.999	29.959	29.985	29.995	29.961	29.909	29.915	29.901
23	29.864	29.826	29.803	29.835	29.759	29.749	29.821	29.885
24	29.920	29.986	30.026	30.087	30.037	29.941	29.858	29.832
25	29.790	29.768	29.735	29.752	29.741	29.759	29.874	29.967
26	30.020	30.051	30.046	30.068	30.004	29.910	29.813	29.764
27	29.735	29.764	29.876	30.090	30.182	30.222	30.324	30.372
28	30.360	30.356	30.318	30.298	30.219	30.144	30.131	30.121
29	30.108	30.150	30.122	30.187	30.168	30.137	30.140	30.153
30	30.125	30.131	30.137	30.218	30.184	30.173	30.210	30.246
31	30.234	30.242	30.244	30.279	30.231	30.202	30.297	30.191
Hourly means.	29.949	29.952	29.959	29.996	29.963	29.935	29.950	29.956

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
January 1	19.1	17.6	15.3	17.6	23.6	23.6	23.6	24.1
2	25.1	27.1	28.6	29.3	32.1	35.6	37.1	34.1
3	33.6	30.6	29.1	27.7	39.1	39.9	34.6	33.1
4	33.1	33.1	32.9	33.9	35.9	39.7	34.1	29.6
5	28.1	32.1	31.1	30.6	30.9	32.1	28.6	24.6
6	21.1	18.1	17.6	18.1	25.1	27.4	26.3	26.1
7	27.6	29.1	30.3	31.1	31.9	32.7	32.1	32.1
8	31.6	29.6	28.1	27.6	31.6	30.7	27.9	25.8
9	29.1	30.1	+30.3	30.7	32.6	29.9	17.1	10.1
10	3.6	2.1	− 0.3	1.6	12.1	16.6	13.1	12.1
11	11.6	10.1	+ 8.1	11.9	27.6	32.6	25.6	20.6
12	19.1	23.1	24.1	25.1	29.9	27.6	26.1	27.6
13	26.6	26.9	26.6	26.6	29.1	30.1	30.5	31.1
14	31.1	30.6	28.6	30.1	34.6	37.3	30.9	28.1
15	23.1	21.6	14.6	15.1	21.1	22.1	19.1	18.1
16	19.1	16.1	18.1	21.6	26.1	28.6	25.6	26.6
17	22.1	20.1	20.1	20.1	23.6	23.6	23.1	23.1
18	22.6	22.1	22.7	23.8	25.6	26.6	26.6	26.1
19	22.7	19.6	17.5	21.1	23.1	22.1	21.6	20.1
20	16.9	14.1	9.9	10.7	23.9	27.1	23.6	22.1
21	21.1	20.1	19.6	21.1	28.6	32.6	31.1	31.6
22	32.3	32.3	31.6	32.1	44.1	50.7	43.1	39.6
23	35.9	30.1	28.1	27.7	38.6	40.6	30.8	26.1
24	24.1	25.1	27.6	30.1	30.6	31.1	31.6	32.1
25	30.1	28.1	26.1	29.1	36.4	38.1	29.1	27.7
26	27.7	24.4	20.6	22.1	29.1	29.7	25.6	20.6
27	18.1	17.1	16.6	22.1	22.9	36.6	35.1	31.6
28	32.6	32.8	33.6	34.7	38.1	39.4	39.1	35.1
29	33.6	34.1	35.1	36.1	36.6	34.3	32.7	32.6
30	32.1	30.9	28.6	30.1	37.9	37.7	36.1	34.1
31	34.1	33.6	33.1	32.6	33.8	33.6	32.1	30.9
Hourly means.	25.4	24.6	23.7	24.9	30.2	31.9	28.8	27.0

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
February 1	29.1	21.1	19.6	21.6	28.6	34.1	29.9	27.1
2	26.1	24.1	21.6	29.1	43.1	45.1	40.2	38.1
3	37.1	36.1	40.6	44.6	50.1	52.1	51.6	42.1
4	35.6	29.1	25.1	25.6	28.1	28.1	21.1	18.4
5	16.1	14.1	12.6	15.1	24.1	28.1	20.9	21.4
6	19.6	18.1	18.1	23.8	35.6	35.1	29.6	24.1
7	20.1	16.1	11.1	9.7	10.3	11.6	10.1	8.6
8	8.1	7.6	8.1	7.1	20.1	19.6	20.1	14.6
9	9.1	6.3	+ 3.6	7.6	9.6	9.6	5.1	1.9
10	0.6	0.3	− 0.3	3.3	14.5	19.7	16.1	15.1
11	18.1	17.6	+21.1	26.6	31.6	33.6	32.8	31.1
12	24.7	17.1	15.6	19.6	31.6	32.1	30.1	27.6
13	24.1	22.7	22.6	24.6	34.1	37.6	32.6	27.1
14	25.1	26.0	27.6	30.1	36.6	41.6	29.6	21.1
15	17.1	13.1	9.6	12.1	20.9	25.3	17.1	13.6
16	10.6	8.6	8.9	11.5	20.4	24.1	20.6	15.1
17	12.6	11.1	9.1	21.1	35.1	46.4	36.6	24.1
18	17.1	12.1	8.6	12.7	21 3	24.1	19.9	17.1
19	17.6	19.6	21.1	21.6	26.1	28.1	27.1	26.1
20	27.6	29.3	30.6	31.6	32.3	31.0	30.6	28.3
21	28.1	27.7	22.6	26.1	36.6	42.1	38.6	29.1
22	30.1	29.1	24.7	29.6	46.8	53.1	47.9	41.1
23	39.1	37.3	36.1	39.9	54.1	51.4	47.1	47.4
24	45.1	44.6	41.6	47.1	52.1	52.6	52.8	50.3
25	51.6	49.1	47.1	51.1	52.4	55.1	56.1	40.1
26	34.6	31.6	30.1	34.1	46.6	51.1	44.7	39.1
27	35.6	34.1	30.6	36.1	42.6	48.1	33.6	29.1
28	27.4	23.1	21.1	20.6	25.1	30.1	26.6	23.6
Hourly means.	24.6	22.4	21.0	24.4	32.5	35.4	31.0	26.5

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
March 1	22.5	20.1	21.1	22.1	26.6	28.6	29.1	30.6
2	32.6	30.6	29.6	31.6	45.7	49.6	42.1	38.6
3	36.1	32.1	31.6	29.1	29.1	30.1	28.6	25.1
4	25.6	26.3	25.6	25.6	31.1	36.6	32.1	29.1
5	27.6	25.6	26.3	29.1	31.6	31.6	30.6	30.6
6	30.7	30.9	31.1	33.1	40.6	41.6	36.2	33.6
7	32.9	32.3	32.1	32.4	31.5	31.9	33.6	32.7
8	32.1	31.6	31.6	34.3	39.6	42.0	37.1	30.1
9	28.1	26.6	29.6	32.1	37.6	41.6	38.9	26.1
10	33.1	32.9	32.1	35.1	48.6	48.3	40.1	34.6
11	32.1	30.1	29.1	37.9	50.3	53.6	46.9	41.6
12	44.6	42.1	39.1	50.9	64.3	63.9	59.1	49.1
13	46.6	43.1	38.1	37.1	42.1	49.4	49.6	38.1
14	35.1	34.6	35.6	39.6	44.1	49.1	49.1	47.3
15	43.9	42.1	45.6	47.1	55.6	65.1	62.1	57.6
16	55.6	52.1	48.6	49.1	57.1	56.1	50.3	42.1
17	38.1	34.1	32.6	34.1	37.1	32.6	25.1	22.6
18	23.1	23.1	23.1	29.3	37.1	41.6	34.1	30.3
19	30.1	32.1	28.1	32.8	40.6	41.6	35.1	33.1
20	31.1	30.7	31.1	31.4	34.9	34.6	33.6	34.1
21	30.3	28.1	27.9	29.1	32.6	32.1	30.1	27.8
22	25.5	23.6	20.6	26.1	31.7	34.1	30.1	27.1
23	24.6	22.1	19.9	27.6	34.7	38.6	33.6	29.7
24	30.1	28.9	32.1	32.1	36.1	46.6	44.1	36.1
25	33.1	31.6	29.6	32.9	38.7	43.1	39.6	32.1
26	27.6	28.6	30.1	38.1	43.7	57.1	56.1	53.1
27	56.1	53.1	48.1	48.6	58.3	63.1	55.6	46.1
28	44.1	38.1	33.1	46.3	54.9	59.6	48.5	46.1
29	41.1	39.1	36.6	41.1	47.1	53.6	49.1	46.6
30	43.6	41.1	39.6	47.1	56.7	58.6	55.6	52.6
31	49.6	48.1	48.6	52.1	59.2	66.7	61.7	55.1
Hourly means.	35.3	33.4	32.5	36.0	42.5	45.9	41.9	37.4

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
April 1	53.6	49.1	46.1	62.5	69.4	72.4	67.1	62.1
2	60.6	57.1	56.1	61.8	67.1	66.4	53.6	54.1
3	45.1	41.1	39.6	41.1	49.6	50.3	46.1	44.6
4	43.1	42.1	40.1	50.1	59.6	65.1	63.6	50.7
5	46.6	44.1	45.6	51.8	59.3	63.5	59.6	52.9
6	48.1	40.1	38.6	50.4	58.8	63.6	58.6	51.1
7	47.1	45.1	44.1	50.4	54.9	54.7	46.6	42.9
8	40.1	40.5	40.6	43.3	49.4	57.8	54.3	49.6
9	47.6	46.1	44.6	50.8	54.1	49.6	50.3	49.6
10	48.6	48.1	46.1	53.6	61.8	61.9	56.6	52.6
11	50.6	50.1	49.6	53.9	61.7	61.1	57.3	55.7
12	54.6	53.1	52.1	48.6	50.1	48.7	45.6	41.1
13	38.9	35.1	33.6	36.7	39.6	46.6	39.8	37.6
14	35.1	33.1	33.7	45.6	52.7	57.1	55.5	46.1
15	42.4	41.1	39.3	53.1	61.1	63.6	57.6	54.1
16	52.6	49.1	47.3	51.6	55.7	48.1	40.6	35.6
17	30.2	27.1	24.1	32.1	34.5	36.1	34.3	30.5
18	29.1	28.1	25.6	31.3	35.1	29.6	29.6	26.1
19	24.1	23.1	22.8	31.1	48.1	50.7	52.1	47.1
20	42.8	40.1	38.1	38.3	49.9	52.7	46.6	40.1
21	36.1	33.1	31.1	36.6	44.2	50.3	46.6	39.8
22	36.1	31.1	29.1	38.1	46.4	52.6	50.1	41.7
23	37.6	35.1	34.1	45.9	54.6	58.9	56.6	47.1
24	40.6	39.1	36.6	53.1	56.1	38.1	44.6	39.1
25	37.6	35.6	36.6	46.8	56.6	61.6	57.6	50.6
26	43.6	38.1	36.6	56.1	61.6	64.1	59.3	57.3
27	55.6	53.6	50.6	51.1	50.1	50.6	49.6	48.6
28	48.1	46.1	47.1	48.1	48.6	46.6	46.6	43.1
29	40.6	37.1	36.1	54.6	62.6	60.4	58.5	51.3
30	54.1	52.1	50.1	59.6	68.1	72.6	66.7	57.6
Hourly means.	43.7	41.1	39.9	47.6	54.0	55.3	51.7	46.7

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1875.	°	°	°	°	°	°	°	°
May 1	53.1	51.1	48.1	49.8	51.8	56.1	51.1	48.6
2	45.1	43.6	45.7	53.6	53.6	57.3	53.9	46.6
3	41.6	38.1	39.7	50.6	57.1	62.1	57.6	52.6
4	50.6	46.6	45.1	45.1	47.1	45.6	50.6	44.6
5	42.1	39.1	40.3	56.1	64.1	64.4	59.6	53.1
6	51.3	50.5	50.3	58.6	63.7	67.1	62.6	55.6
7	48.6	45.1	46.7	53.1	62.1	68.9	60.8	55.1
8	52.3	49.7	49.7	56.1	60.1	61.6	64.1	58.9
9	56.1	53.1	52.6	57.6	72.4	82.2	79.1	74.6
10	72.6	68.6	71.1	64.6	62.1	62.4	67.7	56.1
11	54.1	52.6	50.6	66.7	73.6	75.7	71.6	62.1
12	60.1	58.7	60.7	68.1	77.6	75.6	67.7	61.1
13	55.6	50.6	48.1	62.9	68.7	69.1	64.6	57.1
14	55.1	51.1	47.1	62.3	72.6	74.6	69.3	60.6
15	55.6	55.1	55.9	69.3	76.6	66.1	54.1	52.6
16	49.6	45.6	43.1	55.6	61.6	67.1	63.1	49.7
17	48.1	44.1	39.1	59.8	64.3	68.5	60.1	51.7
18	45.1	41.1	42.6	60.1	62.3	59.1	59.1	50.7
19	47.1	43.1	45.1	59.8	68.8	63.1	63.6	55.4
20	52.6	54.1	53.6	70.1	82.1	83.1	77.1	65.4
21	61.9	59.1	57.6	70.1	81.8	83.6	76.6	69.2
22	67.6	63.1	64.3	75.6	87.5	86.6	74.6	70.6
23	64.6	62.9	62.1	76.6	86.1	89.6	82.8	72.1
24	69.1	66.1	66.6	72.6	79.1	78.1	69.9	68.6
25	67.9	66.9	67.1	68.4	74.1	80.6	77.5	70.1
26	68.2	65.1	66.1	77.7	84.3	86.7	81.6	71.1
27	67.1	60.9	58.5	73.6	78.1	81.1	75.6	66.6
28	60.9	53.9	52.1	75.1	77.1	81.6	75.6	63.6
29	57.3	54.1	55.1	72.3	82.6	84.1	72.6	66.9
30	62.1	53.6	53.1	66.4	75.5	81.5	76.3	61.1
31	55.1	52.1	53.6	69.7	79.7	82.6	77.3	66.1
Hourly means.	56.1	52.9	52.6	63.8	70.6	72.4	67.7	59.9

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1875.	°	°	°	°	°	°	°	°
June 1	62.6	59.1	59.6	71.9	79.6	80.1	70.6	64.1
2	63.1	62.1	63.1	64.6	69.6	69.7	68.3	64.6
3	64.6	63.1	62.6	67.3	71.1	75.1	71.1	66.1
4	62.6	62.1	59.1	75.1	80.3	85.1	78.6	69.6
5	66.6	63.1	63.6	75.6	83.6	81.1	73.1	66.6
6	65.6	65.6	65.6	75.6	77.1	83.1	80.4	72.7
7	68.5	67.1	68.1	74.1	67.4	59.1	60.1	58.1
8	56.7	53.9	54.3	65.1	71.6	73.1	68.9	65.1
9	62.6	58.1	58.1	66.6	70.6	73.1	66.6	60.1
10	56.6	55.7	56.1	68.6	75.6	80.6	78.0	68.1
11	64.7	62.1	62.1	75.9	83.1	85.8	79.1	71.9
12	68.1	66.6	66.6	69.1	67.8	69.1	71.1	70.6
13	66.1	58.1	53.9	60.1	66.1	70.6	68.4	57.1
14	55.1	55.1	55.6	63.7	68.7	74.6	69.6	65.9
15	61.3	57.9	59.1	72.6	75.6	74.9	67.9	66.6
16	64.1	61.6	61.6	69.7	76.1	76.6	72.6	64.1
17	61.9	59.1	59.1	73.1	78.3	80.3	74.7	71.6
18	63.2	64.1	63.7	69.6	70.3	69.3	68.3	59.6
19	55.3	55.1	55.1	67.1	77.1	80.6	75.6	67.3
20	65.1	58.6	58.9	73.3	78.1	82.1	79.1	69.0
21	63.1	58.7	57.6	74.1	80.9	82.6	78.6	69.1
22	66.6	62.9	63.1	78.1	84.3	82.1	79.1	74.1
23	72.1	71.1	69.9	77.3	87.1	90.7	86.6	78.1
24	73.4	72.1	72.1	84.9	91.5	95.6	90.1	79.6
25	75.6	74.1	73.1	87.6	94.1	95.6	82.9	79.6
26	76.6	74.1	75.1	89.6	95.1	79.1	86.9	80.1
27	77.1	74.6	73.6	88.5	94.6	96.1	81.4	77.9
28	75.1	71.6	73.1	86.1	90.1	89.6	76.1	75.1
29	72.1	71.6	73.1	83.6	91.9	96.6	88.6	80.1
30	71.1	70.1	70.6	80.1	84.6	86.6	85.1	76.6
Hourly means.	65.9	63.6	63.6	74.3	79.4	80.6	75.9	69.6

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1875.	°	°	°	°	°	°	°	°
July 1	73.4	70.1	70.5	82.6	88.1	86.6	78.1	75.7
2	70.9	66.6	66.1	67.6	71.4	72.1	70.4	67.1
3	63.1	64.1	66.1	73.1	80.1	80.8	76.6	72.6
4	69.6	69.1	68.1	74.6	81.6	85.6	83.1	77.1
5	74.2	72.1	72.7	77.7	88.5	94.1	88.3	79.6
6	76.6	73.1	73.7	85.1	92.6	93.7	80.1	77.6
7	76.1	74.1	74.9	85.3	86.1	89.3	83.1	77.6
8	73.2	70.3	68.1	80.5	86.6	83.6	82.1	75.6
9	71.1	69.1	70.1	76.1	82.1	80.6	77.1	73.6
10	72.3	72.6	73.1	81.1	88.7	89.6	80.1	74.6
11	72.6	71.1	72.1	76.6	88.6	88.4	86.9	77.1
12	71.9	71.1	69.6	70.3	70.6	69.4	70.1	65.6
13	63.1	61.1	62.1	76.6	88.6	92.6	87.1	76.7
14	72.1	70.1	71.1	78.3	89.3	83.1	83.1	74.6
15	72.1	70.1	69.6	83.1	91.7	90.1	81.9	74.1
16	74.1	70.1	71.1	79.1	88.1	91.1	90.1	79.1
17	75.6	72.1	72.6	73.1	85.1	82.7	84.1	76.6
18	73.6	72.6	73.1	86.5	95.6	92.6	86.1	78.1
19	71.1	69.1	63.1	71.1	77.1	79.1	74.4	70.1
20	66.6	65.1	67.6	72.4	71.6	71.1	70.1	70.2
21	68.6	68.9	68.6	75.9	81.6	86.1	82.6	75.9
22	71.1	69.1	68.1	80.6	86.6	74.6	75.6	74.1
23	73.7	72.3	72.9	80.6	82.1	89.1	85.7	75.1
24	72.6	72.5	70.1	78.1	82.1	85.1	80.6	71.1
25	67.6	66.1	66.6	73.6	80.6	83.1	78.8	75.1
26	71.9	68.1	70.7	83.6	91.1	95.1	85.6	78.4
27	73.1	71.3	71.6	81.1	88.6	73.1	80.6	74.1
28	72.3	71.6	71.1	73.6	68.6	76.6	72.6	71.1
29	67.6	67.3	67.1	69.1	74.7	79.6	79.3	74.6
30	70.6	68.1	68.6	77.9	80.6	79.6	81.1	74.1
31	72.6	71.6	72.3	73.6	76.1	75.1	74.1	70.6
Hourly means.	71.5	69.7	69.8	77.4	83.3	83.7	80.3	74.4

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1875.	°	°	°	°	°	°	°	°
August 1	68.1	66.6	65.1	67.1	71.1	71.6	65.1	63.6
2	66.6	64.1	63.1	64.4	64.6	65.1	62.6	60.6
3	61.1	60.1	61.1	65.3	67.9	74.4	69.3	68.7
4	68.6	69.1	69.6	72.6	80.9	81.3	78.6	73.6
5	70.6	66.6	66.1	76.6	82.1	86.1	81.3	72.6
6	70.1	68.1	67.6	80.7	85.1	84.7	81.6	73.6
7	72.1	69.6	69.9	73.3	80.6	82.6	77.6	71.7
8	69.0	68.1	67.6	71.6	80.1	80.9	77.6	70.1
9	67.1	65.7	62.6	72.1	82.8	84.6	80.1	70.9
10	67.1	66.1	65.6	78.3	85.6	86.1	77.6	74.7
11	71.1	69.9	69.1	77.6	81.6	84.3	78.3	72.1
12	71.1	69.9	70.6	73.6	78.1	82.1	79.1	75.1
13	73.6	72.1	72.1	76.6	81.1	81.1	77.1	69.9
14	68.1	67.1	66.3	76.1	80.3	79.8	75.6	74.1
15	70.6	68.6	68.6	73.6	80.1	78.6	76.6	74.1
16	72.1	71.6	71.6	76.1	81.6	84.6	78.1	76.1
17	73.6	71.6	70.6	74.1	84.6	84.6	73.6	72.6
18	70.9	69.7	70.6	73.1	82.1	79.3	70.4	69.3
19	68.6	67.3	67.1	74.1	81.1	81.6	75.6	71.6
20	68.9	65.6	65.1	72.3	79.1	81.6	74.1	68.1
21	64.9	62.6	61.6	74.6	80.1	82.3	75.1	69.1
22	65.6	64.6	65.1	72.3	78.9	73.7	74.1	70.6
23	70.1	67.6	64.1	63.6	62.1	64.6	65.1	63.6
24	63.1	62.1	62.6	62.1	61.6	62.3	63.3	61.1
25	61.1	60.1	61.1	68.9	73.1	73.7	69.7	62.6
26	59.1	57.1	56.1	68.1	77.3	78.1	72.1	63.5
27	61.1	58.1	57.6	68.5	73.6	75.4	72.3	68.1
28	67.6	66.1	65.1	67.1	69.6	70.4	70.6	69.1
29	69.1	68.1	68.3	69.1	67.1	67.4	70.1	66.6
30	65.1	65.6	65.6	77.6	85.1	85.6	78.1	68.9
31	66.1	65.1	64.6	77.6	86.8	88.3	80.9	72.6
Hourly means.	67.8	66.3	65.9	72.2	77.6	78.6	74.2	69.6

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1875.	°	°	°	°	°	°	°	°
September 1	70.6	69.6	66.1	78.6	84.4	83.8	77.7	69.7
2	67.1	65.6	65.6	75.6	85.8	90.5	81.3	75.4
3	72.7	70.1	70.1	82.8	90.1	92.4	82.6	77.5
4	73.4	70.6	69.6	78.1	88.9	90.4	79.6	74.1
5	68.3	65.1	62.6	74.3	80.1	84.6	77.3	69.6
6	66.1	64.1	62.6	77.3	86.1	90.1	77.6	70.1
7	65.6	59.6	58.1	71.6	78.1	80.6	72.6	64.6
8	60.7	59.1	58.6	71.9	81.1	83.1	74.6	65.6
9	65.4	64.1	62.4	74.6	83.6	84.6	78.1	72.6
10	71.1	70.1	69.6	78.0	83.7	78.1	62.1	58.6
11	52.9	47.1	45.9	57.1	64.7	66.1	60.1	54.1
12	51.6	51.1	55.1	63.6	69.3	70.1	66.4	64.6
13	63.6	62.1	61.6	68.4	78.6	73.4	70.1	64.6
14	64.1	62.1	63.6	69.3	73.1	79.1	71.1	64.5
15	61.1	59.6	59.1	68.6	80.8	80.9	72.0	68.1
16	67.6	64.1	63.1	68.4	69.6	68.4	68.6	67.1
17	63.6	61.1	62.1	69.7	73.7	69.4	62.6	57.6
18	51.1	49.1	47.1	53.6	57.1	55.9	52.1	49.1
19	46.5	44.6	49.1	50.6	55.1	59.9	56.6	51.1
20	48.6	49.6	49.6	58.8	64.1	68.1	59.1	53.1
21	47.5	43.5	45.1	57.6	63.6	63.1	54.6	50.6
22	49.1	49.1	47.1	57.1	60.1	63.6	54.6	50.1
23	48.9	47.1	45.6	54.6	62.1	62.1	56.1	50.3
24	44.7	41.1	40.9	55.1	66.6	67.6	57.1	50.6
25	46.6	45.1	43.9	59.6	70.1	70.6	61.6	57.9
26	57.6	52.6	54.1	59.6	63.1	63.8	55.1	49.1
27	45.1	45.1	44.1	59.6	72.5	74.1	62.1	53.7
28	51.9	48.1	46.6	61.6	76.6	78.6	65.3	61.1
29	56.1	55.1	54.1	61.1	74.6	76.1	64.7	59.3
30	58.6	57.3	55.6	65.6	74.6	77.1	69.1	61.3
Hourly means.	58.6	56.4	56.0	66.1	73.7	74.9	66.8	61.2

Mean Time.	0h.	3h.	6h.	9h.	Noon..	3h.	6h.	9h.
1875.	°	°	°	°	°	°	°	°
October 1	60.6	59.1	57.1	67.1	70.1	67.6	59.6	53.1
2	46.1	43.1	42.6	53.6	63.1	64.6	53.6	48.4
3	45.6	43.6	40.9	56.3	67.6	66.6	58.6	51.9
4	51.6	51.1	50.4	58.6	67.1	67.9	60.1	56.3
5	53.1	52.1	51.1	60.6	78.6	77.1	66.6	59.3
6	56.5	55.6	57.1	62.6	71.1	71.1	67.6	65.6
7	66.1	61.1	55.1	58.8	61.6	62.6	54.6	46.6
8	45.6	43.1	40.9	54.6	65.6	68.4	59.6	57.1
9	54.6	49.1	44.6	54.4	62.1	63.6	54.6	52.1
10	50.3	53.6	53.7	60.1	67.1	71.3	64.1	59.6
11	54.1	52.1	48.1	46.6	49.1	49.6	47.6	47.1
12	45.3	43.1	40.5	47.6	52.6	52.6	44.6	37.6
13	35.1	33.6	33.6	43.9	53.4	55.6	45.1	38.3
14	34.1	33.1	32.1	42.6	53.3	56.1	50.6	49.6
15	49.6	50.6	49.6	54.9	63.3	66.1	58.1	56.6
16	53.1	53.1	51.4	44.9	43.6	48.6	46.1	44.1
17	40.1	39.6	36.1	43.7	56.3	57.9	48.6	45.1
18	43.1	41.1	39.1	45.9	53.6	60.1	54.6	50.1
19	45.9	43.1	39.7	45.6	48.6	51.6	44.1	39.6
20	35.9	33.6	34.1	44.6	58.1	61.1	50.1	44.6
21	44.1	40.3	38.1	48.1	72.1	76.1	63.1	58.1
22	53.3	49.6	46.6	54.5	74.3	76.6	64.6	55.6
23	52.1	47.6	46.3	54.1	67.6	73.1	65.1	59.4
24	43.6	50.1	47.6	54.1	75.1	77.1	62.1	52.1
25	51.1	49.1	44.6	56.6	77.3	78.3	65.9	57.4
26	53.6	50.6	49.6	58.1	76.7	77.1	69.6	55.1
27	50.1	48.1	44.1	53.3	61.6	58.3	47.6	42.3
28	39.6	36.1	34.1	44.6	60.6	63.6	55.4	52.6
29	52.1	47.6	44.1	52.1	68.6	69.1	62.9	58.1
30	52.6	51.1	52.1	57.1	63.3	64.7	47.6	47.1
31	45.9	41.1	37.1	42.6	43.6	42.6	38.5	38.3
Hourly means.	48.5	46.6	44.6	52.3	62.8	64.4	55.8	50.9

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6 .	9h.
1875.	°	°	°	°	°	°	°	°
November 1	37.1	34.1	33.3	40.1	49.1	47.6	42.1	39.5
2	39.5	36.1	33.3	40.6	47.3	48.8	42.1	36.6
3	31.6	31.1	28.7	34.1	36.6	35.6	35.6	34.5
4	38.3	38.5	38.6	39.9	42.9	41.8	40.1	38.1
5	36.4	33.6	33.4	37.8	39.1	40.5	36.3	31.6
6	28.9	28.4	27.7	37.6	51.6	49.6	41.5	37.4
7	35.1	34.1	33.4	37.9	45.1	47.6	46.6	44.1
8	42.1	41.6	41.6	42.3	48.1	51.7	43.1	38.1
9	35.5	33.4	29.9	38.1	50.4	48.1	45.1	44.1
10	43.3	43.1	41.1	41.3	42.9	43.7	41.6	40.6
11	40.6	41.6	41.6	45.0	50.1	51.9	44.6	40.6
12	37.6	34.9	30.1	37.6	56.6	60.1	49.9	46.6
13	42.6	37.1	33.6	43.6	61.1	62.7	55.6	51.1
14	50.1	49.1	50.1	54.1	61.1	60.3	54.1	49.6
15	47.6	42.7	39.6	43.3	51.1	55.3	51.1	45.6
16	41.6	40.9	45.1	47.1	49.9	53.3	48.6	41.6
17	36.1	34.1	30.6	33.6	35.6	36.6	31.1	29.7
18	26.9	24.1	23.1	28.6	41.1	39.1	37.9	38.1
19	37.6	37.1	41.1	45.9	55.6	62.1	56.1	53.1
20	50.6	48.6	49.1	46.1	44.1	43.7	41.1	41.1
21	41.1	40.6	40.1	40.6	42.6	46.1	42.6	42.6
22	37.4	33.1	29.1	32.1	38.4	38.1	31.6	28.6
23	31.9	33.9	35.1	36.6	36.6	37.6	39.1	41.9
24	44.7	46.6	45.6	45.1	49.1	44.6	39.6	35.3
25	32.1	28.1	27.1	31.8	42.6	40.6	34.6	30.7
26	31.1	33.6	36.1	37.1	40.6	41.6	42.1	42.9
27	41.6	39.1	36.1	41.1	47.6	46.1	39.1	33.9
28	30.5	31.1	34.6	37.1	44.4	44.7	43.8	44.1
29	43.9	43.1	43.1	48.1	46.7	42.9	34.1	26.9
30	22.1	21.1	11.6	18.4	26.1	24.6	20.1	18.1
Hourly means.	37.8	36.6	35.4	39.5	45.8	46.2	41.7	38.9

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1875.	°	°	°	°	°	°	°	°
December 1	16.9	15.1	15.6	19.6	27.1	29.6	27.1	25.1
2	26.1	24.9	23.6	24.6	32.3	32.5	27.1	26.6
3	23.6	23.1	25.1	27.6	30.6	30.3	29.1	30.1
4	30.6	30.3	31.6	33.6	36.3	38.6	38.9	38.9
5	38.8	38.9	39.1	38.6	39.3	38.1	36.9	37.1
6	37.6	36.1	36.6	36.5	39.3	39.5	38.1	37.1
7	37.1	36.6	36.9	38.1	39.6	39.7	39.7	41.1
8	40.1	39.1	38.6	39.1	40.6	42.6	42.3	41.6
9	41.6	41.1	40.1	40.6	42.6	43.6	40.9	39.6
10	35.6	32.1	31.8	34.5	37.7	38.4	32.1	29.1
11	31.1	30.1	29.6	31.6	37.6	37.5	37.6	36.9
12	35.7	32.6	30.3	34.6	43.6	44.1	36.1	30.7
13	30.3	28.1	28.9	38.6	43.8	40.6	30.6	33.1
14	33.7	30.1	28.6	32.6	32.6	32.3	27.1	24.6
15	22.1	21.1	20.1	25.1	31.6	30.1	32.1	32.1
16	32.1	31.1	26.1	27.1	44.7	43.1	40.5	34.1
17	36.6	35.6	32.1	32.9	28.1	23.6	18.1	16.6
18	15.1	13.1	12.6	15.1	21.6	22.6	17.6	18.6
19	19.1	17.1	17.4	21.1	28.3	28.6	23.1	20.6
20	16.1	17.1	15.4	17.6	33.1	37.1	31.9	29.9
21	29.7	25.1	23.1	27.3	45.9	53.1	46.6	43.6
22	47.1	47.3	51.1	49.1	63.3	63.6	54.1	43.1
23	42.1	40.6	43.6	44.6	65.9	69.1	61.1	57.6
24	50.5	49.1	48.6	42.1	40.1	41.3	41.9	41.1
25	40.5	39.6	39.6	41.1	44.6	54.1	50.6	45.4
26	43.1	41.3	40.6	42.1	43.1	42.3	42.1	42.1
27	43.6	42.9	48.1	43.8	45.6	45.1	37.1	34.3
28	33.6	31.6	32.1	31.1	33.1	34.1	34.9	36.1
29	36.1	37.1	36.6	37.1	39.1	40.6	40.6	40.6
30	40.7	39.9	39.6	41.6	45.7	45.1	44.7	44.1
31	44.6	42.9	44.8	45.1	47.6	49.7	49.7	50.9
Hourly means.	33.9	32.6	32.5	34.0	39.5	40.3	37.1	35.6

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
January 1	20.0	18.2	16.0	18.0	24.2	24.2	24.5	25.2
2	26.0	27.6	29.0	30.0	32.0	35.8	32.0	30.5
3	30.0	28.5	28.0	27.8	35.0	35.8	32.5	32.0
4	33.5	33.5	33.5	34.0	36.2	38.8	34.0	30.0
5	28.5	30.0	29.5	29.0	29.0	29.0	26.0	23.0
6	21.0	18.5	18.0	19.0	25.8	28.0	27.4	26.5
7	28.0	29.5	31.0	31.6	32.6	33.4	32.8	32.9
8	32.0	29.5	27.5	27.0	29.5	30.0	28.5	26.5
9	29.5	30.5	30.5	31.0	32.5	27.0	15.5	10.5
10	4.6	3.0	1.5	. .	. .	. .	13.8	12.5
11	12.0	10.9	9.5	. .	26.5	32.5	26.3	21.3
12	19.9	23.5	24.5	25.0	30.5	28.5	27.0	28.0
13	27.3	27.4	27.5	27.5	29.7	31.0	31.0	32.0
14	32.0	31.3	29.5	28.5	35.0	35.0	31.0	26.0
15	22.5	21.0	14.5	14.5	20.5	22.0	19.0	17.4
16	19.0	16.8	17.5	21.5	25.0	28.0	26.3	27.0
17	22.8	20.5	20.6	21.0	24.0	24.5	24.0	23.7
18	23.0	23.0	23.0	24.5	26.0	26.0	26.5	26.5
19	23.5	20.0	18.0	21.5	23.5	22.5	21.5	20.5
20	17.5	15.0	11.6	11.6	24.0	27.5	24.2	23.0
21	21.5	21.0	20.2	21.9	29.0	33.0	32.0	32.5
22	33.0	33.0	32.0	32.8	42.5	49.5	42.0	40.0
23	35.0	28.0	26.5	28.3	32.0	34.5	30.8	26.0
24	24.0	25.0	27.5	30.5	31.5	32.0	32.2	32.6
25	30.5	28.5	27.6	27.5	35.0	34.7	29.0	27.0
26	26.0	24.5	21.2	21.5	26.5	28.0	25.2	21.0
27	19.0	18.0	. .	22.8	31.0	34.2	33.5	32.0
28	32.7	32.5	34.0	35.0	38.0	39.5	39.5	35.8
29	33 6	34.5	35.5	36.5	37.0	35.0	33.5	33.0
30	32.5	31.8	29.5	30.8	36.5	37.0	35.0	34.0
31	34.0	34.0	33.5	33.5	34.5	34.5	32.5	31.2
Hourly means.	25.6	24.8	24.2	26.3	30.5	31.7	28.7	27.1

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
February 1	27.2	20.8	20.0	. .	29.5	30.5	29.0	27.5
2	25.2	23.8	22.0	28.3	38.5	40.5	37.0	37.0
3	35.5	35.0	40.6	45.3	51.0	52.7	51.5	40.0
4	32.5	29.8	23.0	. .	29.0	. .	19.0	17.0
5	16.0	14.8	13.4	15.5	25.0	28.5	20.0	20.6
6	19.0	17.6	18.0	23.0	34.5	36.0	30.0	25.0
7	21.0	16.6	11.8	10.6	11.0	12.5	. .	. .
8	. .	. .	. .	. .	18.5	19.0	19.5	14.0
9	10.0	. .	. .	8.5	10.5	11.0	. .	. .
10	1.2	1.2	0.5	. .	14.6	19.2	17.0	. .
11	18.5	18.0	21.8	27.4	31.6	34.0	33.2	27.5
12	25.2	17.6	16.0	20.5	28.0	30.0	29.8	28.0
13	23.5	23.0	22.8	24.0	31.6	36.5	32.5	27.0
14	25.5	26.6	28.0	30.0	34.0	37.2	26.0	21.0
15	17.5	14.0	. .	12.5	20.5	23.5	17.0	13.5
16	11.0	9.0	10.0	12.0	19.5	22.0	20.5	14.8
17	13.5	11.8	10.0	21.6	31.5	39.4	31.0	22.0
18	17.0	12.5	. .	13.0	19.4	22.0	19.0	17.4
19	18.0	20.0	21.0	22.0	26.4	28.4	27.6	27.0
20	28.0	29.8	31.5	32.0	32.5	31.5	31.5	28.6
21	28.0	28.0	23.0	25.5	33.5	38.5	35.6	29.5
22	30.4	29.0	25.4	30.0	43.0	48.0	44.5	38.2
23	36.8	36.0	35.2	39.5	49.7	52.0	47.6	47.8
24	46.0	45.3	42.5	47.7	52.0	53.0	53.2	51.0
25	52.5	50.0	47.5	52.0	53.0	55.8	56.5	38.0
26	35.0	31.0	29.0	34.0	41.5	43.0	42.0	36.5
27	34.5	33.5	31.0	35.0	42.5	40.0	33.5	28.0
28	28.0	23.0	21.5	21.0	25.0	29.0	26.0	22.5
Hourly means.	25.0	23.7	26.0	26.2	31.3	33.8	31.9	27.9

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
March 1	22.6	20.5	21.5	22.6	27.0	29.0	30.0	31.5
2	33.0	31.0	30.0	32.0	43.5	48.0	42.0	38.5
3	35.0	32.0	31.6	29.5	29.5	30.5	29.5	25.5
4	26.0	26.8	26.0	26.0	31.0	36.0	32.5	29.5
5	28.0	26.0	27.0	29.5	32.0	32.2	31.5	31.5
6	31.5	31.6	31.8	33.8	38.6	41.5	36.5	34.5
7	33.5	32.7	32.8	33.0	32.0	32.5	33.5	33.5
8	33.0	32.0	31.5	32.6	38.2	38.5	34.5	29.5
9	28.2	26.8	30.0	31.5	35.0	39.0	38.6	26.0
10	33.5	33.0	32.8	35.4	43.0	42.0	37.5	33.4
11	31.5	30.5	29.5	36.2	48.0	50.0	45.0	40.5
12	42.5	42.0	39.5	46.5	55.0	56.0	53.0	48.0
13	46.0	43.5	38.5	37.8	42.2	49.0	47.5	38.0
14	35.5	35.0	36.0	40.0	44.0	46.0	47.0	46.0
15	43.5	42.5	46.0	47.5	55.5	63.0	59.0	56.0
16	55.5	52.5	43.5	47.0	50.0	50.0	45.3	39.6
17	33.0	32.0	31.5	32.0	31.5	28.2	23.0	22.5
18	23.5	23.5	23.6	29.5	32.5	34.5	30.5	27.3
19	28.5	30.0	28.0	31.8	35.8	36.5	33.0	31.2
20	31.0	31.0	31.5	32.0	35.3	35.4	34.5	34.5
21	30.0	29.0	30.5	28.0	30.5	30.2	29.0	27.5
22	26.0	24.0	21.0	26.5	32.0	34.0	27.5	27.0
23	25.0	22.6	20.2	23.5	30.0	33.6	31.8	38.5
24	28.0	29.5	32.0	32.9	36.5	44.5	43.5	36.0
25	33.0	30.5	27.0	29.5	35.0	36.0	34.0	30.5
26	27.5	28.0	29.4	35.0	41.0	49.0	49.0	50.5
27	50.5	50.0	45.0	39.6	46.4	48.5	46.5	41.0
28	39.5	36.0	32.5	40.0	44.5	48.0	40.0	40.5
29	39.8	39.0	36.0	38.2	42.2	46.0	43.5	41.5
30	38.7	38.0	37.5	43.5	49.1	49.5	49.0	48.5
31	47.0	47.0	47.5	48.2	55.0	60.6	57.6	54.6
Hourly means.	34.1	33.1	32.2	34.5	39.4	41.8	39.2	36.5

Mean Time.	0^{h}.	3 .	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
April 1	52.5	50.8	46.5	58.2	60.0	62.0	59.5	57.5
2	57.5	56.5	55.5	59.3	62.5	61.5	53.6	54.5
3	45.5	41.5	40.0	39.5	43.5	44.5	43.5	41.5
4	40.0	40.0	38.5	44.0	49.7	54.0	54.0	48.3
5	45.0	44.0	43.0	45.8	50.5	52.0	49.1	46.5
6	43.0	38.0	38.0	44.8	50.0	54.0	53.5	47 0
7	45.0	44.0	43.0	46.0	50.6	49.5	43.8	41.4
8	39.2	40.0	40.3	42.5	47.5	54.2	52.5	49.0
9	47.3	46.3	45.0	50.0	52.0	49.2	51.0	50.0
10	49.0	48.7	46.6	51.5	53.5	53.5	53.0	50.0
11	47.8	48.0	48.5	50.0	55.0	54.5	57.5	55.0
12	54.5	53.5	52.5	48.6	49.0	49.0	46.0	41.5
13	39.5	35.0	34.0	37.2	37.0	43.8	39.5	38.0
14	36.0	33.5	33.8	42.0	47.4	50.5	49.3	45.0
15	42.0	40.0	39.0	50.0	55.5	56.5	53.0	53.0
16	51.0	48.0	44.3	46.5	48.4	41.5	36.0	35.3
17	27.6	24.5	24.0	29.5	31.0	32.8	33.3	31.0
18	. .	28.0	24.0	31.5	31.5	28.0	28.5	26.5
19	24.0	23.0	. .	31.5	40.5	41.5	43.5	40.5
20	39.0	39.5	38.5	37.0	44.3	43.5	38.5	34.5
21	31.5	31.5	28.5	32.4	37.5	41.3	38.2	34.5
22	32.0	30.5	28.5	33.5	41.2	45.3	43.5	38.0
23	35.0	34.2	33.5	41.0	47.7	50.0	47.5	44.0
24	40.5	38.5	37.0	48.8	47.3	38.0	39.0	34.5
25	34.0	33.0	34.0	41.5	48.5	51.0	48.5	44.0
26	41.5	37.8	37.0	49.7	52.2	55.0	52.6	50.3
27	49.4	48.0	49.2	48.0	49.2	49.7	49.5	49.0
28	48.5	46.8	47.0	48.5	48.0	46.5	46.0	42.5
29	41.0	38.0	36.8	51.5	57.0	56.0	55.0	49.0
30	52.0	50.0	45.5	50.5	56.8	58.5	55.0	52.0
Hourly means.	42.4	40.3	39.7	44.3	48.1	48.9	47.1	44.1

Mean Time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	°	°	°	°	°	°	°	°
May 1	50.0	49.8	44.5	44.5	47.0	47.8	45.4	46.5
2	44.3	43.3	44.2	41.0	45.0	47.0	45.0	40.0
3	38.0	36.2	37.2	43.0	48.5	53.0	51.5	48.5
4	47.5	46.0	45.0	45.0	45.5	45.0	47.5	42.5
5	41.0	38.8	40.2	50.5	55.4	54.0	53.5	49.0
6	48.0	50.8	50.6	56.0	59.0	57.6	52.0	47.0
7	44.5	42.5	41.0	45.0	50.7	57.2	54.0	51.0
8	49.5	49.0	49.2	54.0	56.5	58.0	60.0	57.0
9	55.0	52.8	52.5	56.2	66.4	71.2	70.5	64.8
10	63.8	60.0	65.5	63.0	56.2	56.0	61.5	54.5
11	51.0	50.5	49.0	60.8	64.1	66.4	63.5	59.0
12	58.0	56.5	55.5	61.2	66.0	59.6	53.6	50.2
13	49.0	48.0	47.0	53.9	58.5	58.3	56.5	54.0
14	52.0	48.0	46.0	55.5	61.0	61.5	58.0	55.0
15	53.5	54.0	55.0	62.3	63.5	56.5	51.5	48.6
16	46.5	42.5	42.5	48.5	50.8	53.5	49.5	47.2
17	42.0	40.0	39.0	49.0	51.5	54.3	51.5	47.2
18	45.0	40.0	42.0	53.5	54.7	51.0	53.0	48.5
19	45.6	43.0	44.0	52.0	56.5	52.0	52.0	52.0
20	47.0	48.5	49.5	60.5	65.0	63.5	61.5	57.0
21	55.5	53.0	53.5	63.5	70.5	70.0	68.2	63.5
22	62.6	61.5	61.7	67.5	72.0	71.5	69.5	61.0
23	63.6	62.5	62.0	70.6	73.5	73.0	71.5	70.5
24	66.2	65.0	66.5	69.0	72.6	71.0	69.5	68.0
25	67.8	67.0	67.5	68.6	71.8	73.6	72.5	69.0
26	68.0	65.5	66.5	70.2	70.6	62.5	71.0	67.5
27	61.0	60.0	56.0	64.5	63.6	65.5	67.0	57.8
28	56.2	52.6	52.2	61.5	63.4	66.5	62.0	57.0
29	55.2	53.3	54.5	65.0	70.6	70.0	67.0	64.0
30	57.0	50.5	50.5	56.4	61.0	61.5	61.5	57.5
31	54.5	51.0	52.5	59.5	64.0	64.2	65.0	58.2
Hourly means.	52.8	51.0	51.0	57.4	60.5	60.4	59.2	55.2

Mean Time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	°	°	°	°	°	°	°	°
June 1	58.5	57.0	59.0	64.1	66.1	64.5	60.0	59.0
2	58.0	60.5	62.0	61.6	63.1	63.5	63.0	60.5
3	59.0	60.0	62.0	63.0	65.5	67.0	66.2	62.5
4	60.0	61.0	58.6	68.2	68.4	70.3	70.5	66.9
5	65.0	61.5	62.0	71.2	74.7	72.8	71.5	66.0
6	66.0	66.0	66.0	71.0	71.3	73.5	71.5	69.5
7	68.4	67.5	68.0	71.2	67.0	59.5	59.5	58.0
8	57.0	54.4	54.2	61.0	63.0	63.0	62.6	60.8
9	60.2	57.5	57.8	61.0	62.5	64.5	61.0	58.6
10	56.7	55.5	56.5	64.0	69.0	71.2	69.0	65.6
11	63.5	62.0	62.0	70.5	73.5	75.5	73.0	67.2
12	65.5	64.5	65.0	67.0	67.5	69.0	70.0	69.5
13	63.5	54.2	50.6	54.0	58.5	61.0	59.0	56.0
14	53.0	52.5	52.0	55.5	60.0	63.2	63.5	62.5
15	58.8	57.4	58.6	63.0	66.0	66.2	65.5	64.5
16	63.5	61.0	61.5	65.8	66.0	69.3	68.0	63.0
17	61.5	59.0	59.5	69.0	69.9	68.5	65.0	68.0
18	62.5	64.0	63.0	67.0	66.5	61.5	59.5	57.0
19	55.0	52.2	52.0	60.0	65.2	66.0	64.1	59.0
20	58.5	54.5	57.0	61.6	67.0	68.0	66.0	62.0
21	60.0	57.0	57.0	69.0	70.6	70.2	68.2	65.0
22	65.5	61.0	60.0	73.8	77.0	75.0	73.6	71.0
23	72.0	71.0	69.5	74.5	78.0	78.8	76.6	73.5
24	72.0	72.0	72.0	78.3	79.3	81.0	78.5	75.5
25	73.6	73.0	72.0	80.4	80.8	81.5	73.0	75.0
26	73.5	73.0	74.5	79.6	80.2	76.5	79.5	78.0
27	75.3	74.0	72.6	80.3	81.5	80.5	77.5	75.8
28	73.8	70.5	71.0	78.5	78.5	78.5	72.0	73.0
29	71.0	70.5	73.0	73.0	81.5	78.0	78.0	76.0
30	71.0	70.0	70.6	76.0	75.0	77.5	76.6	73.3
Hourly means.	64.0	62.4	62.6	68.4	70.4	70.5	68.7	66.4

Mean Time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	°	°	°	°	°	°	°	°
July 1	70.9	68.5	68.5	75.0	78.0	76.0	70.6	68.0
2	69.2	64.0	63.0	63.0	65.5	66.0	66.3	66.0
3	59.0	63.0	64.0	67.0	72.5	72.5	70.0	67.0
4	67.0	68.0	66.8	71.5	74.5	78.0	76.0	75.0
5	73.0	71.5	72.0	75.0	79.0	81.0	81.0	76.0
6	75.0	72.5	73.2	79.0	82.0	82.5	76.0	74.5
7	76.0	74.5	74.6	79.0	79.0	79.0	77.5	75.5
8	71.8	68.0	65.8	72.5	74.6	71.5	72.0	71.5
9	71.3	68.8	69.5	72.5	74.8	73.8	73.5	71.5
10	71.5	72.5	73.5	76.5	78.0	77.5	76.5	74.0
11	72.0	71.0	71.0	72.6	77.6	74.6	74.0	69.5
12	69.0	70.0	63.5	65.0	63.6	64.5	67.0	64.0
13	63.0	60.5	62.0	71.6	76.5	76.7	75.0	70.5
14	68.0	66.5	69.0	72.6	77.5	75.6	77.0	72.4
15	71.0	70.5	70.0	75.8	79.5	78.2	75.6	73.2
16	74.5	70.5	70.0	72.6	78.0	78.9	81.2	75.0
17	72.5	71.5	72.0	72.5	76.9	76.5	77.0	75.0
18	73.0	72.0	73.0	81.0	82.5	84.0	85.5	70.5
19	67.5	65.0	59.0	61.3	63.7	66.0	66.4	60.6
20	63.0	62.5	65.0	68.0	67.5	68.2	69.0	69.0
21	68.5	69.0	68.6	73.5	77.0	78.0	77.2	73.5
22	71.0	69.5	68.5	72.0	77.0	74.3	74.0	74.2
23	74.2	72.5	72.5	76.4	76.5	79.0	79.2	73.5
24	71.5	71.0	69.0	70.0	71.5	71.0	70.5	69.0
25	67.0	65.8	65.5	71.0	73.0	76.5	74.5	73.5
26	71.0	67.5	71.0	79.0	79.8	80.0	76.8	73.5
27	71.0	70.0	70.0	75.0	79.0	71.6	78.0	74.0
28	72.5	71.8	71.0	73.0	66.5	71.0	69.0	70.5
29	68.0	67.0	67.0	69.0	74.5	77.0	77.0	73.0
30	70.5	68.0	68.6	75.0	76.5	76.0	78.0	73.0
31	72.6	71.5	72.0	71.5	69.2	70.0	71.0	68.5
Hourly means.	70.1	68.8	68.6	72.5	74.9	75.0	74.7	71.4

Mean Time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	°	°	°	°	°	°	°	°
August 1	68.0	67.0	65.5	65.2	67.0	67.6	64.0	63.8
2	66.5	64.5	63.5	64.4	64.3	63.5	61.3	60.5
3	61.5	60.5	61.5	64.3	66.6	73.0	69.5	69.4
4	69.0	69.5	69.5	71.8	76.7	77.0	76.0	73.0
5	71.0	67.0	66.5	73.0	75.0	76.5	74.5	70.5
6	69.8	68.0	68.0	76.0	77.5	77.0	75.6	72.0
7	72.5	70.0	69.5	73.0	77.8	76.0	76.0	69.5
8	69.0	69.0	68.0	71.0	72.0	72.0	74.0	69.0
9	67.0	65.8	63.4	70.0	73.2	74.0	73.0	69.0
10	67.0	66.3	66.0	55.0	77.5	76.8	74.0	73.5
11	69.5	69.0	69.0	74.5	76.5	77.6	75.1	71.0
12	71.5	70.0	70.5	73.0	76.5	78.7	77.0	75.0
13	73.6	72.6	72.2	75.5	77.5	77.8	75.5	70.0
14	68.5	67.5	67.0	74.3	76.0	76.0	74.0	73.4
15	70.5	68.0	69.0	72.0	76.8	75.0	75.0	74.5
16	72.2	71.5	71.8	75.0	76.8	79.0	76.5	75.0
17	73.3	72.0	70.5	73.4	79.6	80.0	74.0	72.5
18	71.2	70.2	71.0	73.0	77.5	76.5	70.5	69.8
19	69.5	68.0	67.5	72.8	75.6	76.0	75.0	71.8
20	69.2	65.5	65.0	69.5	72.5	73.5	71.5	66.5
21	65.0	62.8	61.8	68.0	71.9	73.5	72.2	60.5
22	64.8	64.5	65.0	71.0	75.6	72.0	72.5	70.5
23	70.2	68.0	64.5	63.0	62.4	64.2	64.6	63.5
24	63.0	62.5	62.5	62.8	62.0	62.0	62.0	60.5
25	60.5	60.5	61.0	64.6	66.8	66.5	64.2	62.0
26	59.5	57.5	56.5	64.0	67.6	68.0	65.5	61.8
27	59.6	57.5	57.0	64.5	68.8	70.5	69.2	68.0
28	67.5	66.5	65.0	66.5	68.8	69.6	70.0	69.8
29	69.5	68.5	68.8	69.5	67.8	67.8	69.8	67.2
30	66.2	66.0	66.2	75.5	77.0	76.5	74.0	69.0
31	63.0	62.5	65.2	73.5	78.0	77.0	76.8	72.5
Hourly means.	67.7	66.4	66.0	69.6	72.9	73.2	71.7	68.8

Mean Time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	°	°	°	°	°	°	°	°
September 1	71.0	60.0	66.5	74.5	77.5	75.5	72.5	69.8
2	67.2	65.0	64.0	73.0	78.5	81.5	77.5	75.2
3	72.2	70.0	70.0	78.0	81.5	83.0	80.0	76.5
4	73.5	70.0	69.0	74.5	80.0	80.0	75.0	68.5
5	68.0	64.0	61.0	67.6	71.0	74.5	73.8	68.0
6	65.5	64.5	63.0	72.8	77.5	78.2	70.0	69.0
7	62.0	58.5	57.5	64.0	67.0	69.0	68.0	65.0
8	61.0	59.5	58.0	67.5	72.5	74.0	72.0	65.5
9	65.0	64.2	62.5	70.2	75.0	76.9	74.5	71.5
10	69.8	69.5	69.0	75.0	79.0	76.4	60.0	55.0
11	50.9	46.5	45.6	51.0	56.0	57.0	55.4	52.0
12	51.0	51.0	55.2	59.6	63.3	63.8	63.6	62.5
13	62.5	62.0	61.0	66.0	71.5	69.2	67.5	63.6
14	63.8	62.0	63.7	67.0	69.8	70.2	68.5	64.0
15	61.5	59.5	59.5	67.0	73.5	73.6	70.5	68.5
16	68.0	64.5	63.5	67.6	69.0	68.0	69.0	67.5
17	59.0	60.8	62.5	66.0	66.0	63.3	57.8	52.6
18	49.0	48.5	47.5	49.0	51.0	52.0	52.0	49.0
19	47.0	45.0	49.8	51.0	54.0	57.5	55.5	51.5
20	49.0	50.0	50.4	57.5	58.0	64.5	53.6	49.2
21	46.5	44.0	45.3	52.5	56.0	56.0	51.2	50.2
22	48.5	48.2	46.5	51.5	54.5	54.5	51.8	49.5
23	49.0	47.0	45.5	50.7	54.5	54.5	52.0	49.8
24	45.4	42.0	41.8	52.5	59.5	60.5	55.2	50.0
25	47.4	45.6	44.5	54.5	63.0	63.0	59.5	57.0
26	56.5	53.2	53.5	56.0	56.5	55.5	51.0	47.5
27	44.2	43.5	43.5	54.5	62.5	63.5	57.0	52.5
28	50.0	48.5	47.0	57.5	65.5	68.0	62.2	59.5
29	55.6	55.0	54.4	60.5	68.5	68.0	62.0	59.2
30	59.3	58.0	56.0	64.0	69.0	69.5	67.0	61.6
Hourly means.	57.9	56.0	55.9	62.4	66.7	67.3	63.5	60.3

Mean Time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	°	°	°	°	°	°	°	°
October 1	60.0	59.0	57.0	65.0	62.5	61.5	55.5	48.0
2	45.0	43.0	42.0	49.5	54.5	53.5	50.6	48.5
3	46.0	44.5	41.5	53.6	59.8	59.0	53.5	51.8
4	52.0	51.8	51.0	57.6	62.0	63.0	59.0	56.0
5	53.5	52.5	52.0	60.0	70.5	69.0	64.5	59.4
6	57.0	56.0	57.5	62.5	68.0	69.0	66.5	65.5
7	66.0	60.0	54.0	55.0	55.5	55.0	50.8	47.0
8	45.4	43.8	41.6	52.0	58.5	62.0	58.0	56.0
9	51.5	48.0	44.0	49.8	55.5	56.5	51.2	49.8
10	49.0	53.5	53.6	58.0	63.4	65.0	62.4	57.6
11	53.5	50.5	47.8	45.5	47.5	47.5	47.0	46.2
12	44.4	41.8	39.5	43.8	47.5	47.0	42.0	38.0
13	35.8	34.3	34.0	41.7	48.0	49.5	42.0	37.6
14	34.0	33.8	32.5	42.0	49.5	52.0	50.0	49.5
15	49.0	50.5	50.0	53.5	58.5	60.0	56.4	54.2
16	53.7	53.6	52.0	45.2	44.5	47.5	46.0	41.0
17	37.5	37.0	34.5	40.2	49.6	51.0	47.0	44.0
18	42.0	41.5	40.0	45.0	50.5	55.5	49.5	48.0
19	43.6	41.0	38.5	42.5	44.5	46.8	40.8	38.0
20	35.4	33.5	34.0	41.6	51.0	53.8	48.5	44.8
21	43.0	40.5	38.8	46.2	61.0	62.0	56.5	53.5
22	49.8	48.8	46.5	52.0	64.0	65.5	58.0	54.5
23	51.6	48.0	47.0	53.0	61.0	64.0	59.0	57.6
24	43.5	50.5	48.0	54.0	65.6	64.5	58.5	52.0
25	51.0	49.7	45.2	54.5	65.0	67.0	60.3	55.2
26	52.5	50.5	50.0	56.0	68.2	66.6	63.5	53.0
27	47.5	46.5	42.0	48.0	52.0	49.5	42.7	40.6
28	39.5	36.2	34.5	42.0	54.0	55.5	52.0	52.0
29	50.0	47.5	44.5	50.5	60.0	62.0	59.0	56.2
30	52.0	51.0	52.0	56.0	63.5	64.5	47.0	44.0
31	41.8	38.0	34.0	38.0	38.0	38.0	34.4	34.5
Hourly means.	47.6	46.3	44.5	50.1	56.5	57.5	52.6	49.4

Mean Time.	0^h.	3^h.	6 .	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	°	°	°	°	°	°	°	°
November 1	34.0	32.2	31.4	36.8	43.5	42.8	40.0	39.0
2	39.0	36.0	33.8	37.7	41.5	42.8	38.0	34.5
3	31.8	30.3	29.2	32.0	34.8	36.0	36.0	34.6
4	39.0	39.3	39.5	39.8	42.5	41.0	39.0	37.0
5	36.5	34.0	34.0	37.5	36.5	38.0	36.0	31.5
6	29.6	29.0	28.5	37.5	45.5	44.5	40.0	37.0
7	35.0	34.0	33.6	37.8	43.2	45.0	44.5	43.8
8	42.5	41.5	41.4	42.0	44.7	46.4	42.0	38.0
9	35.5	33.5	30.5	36.5	45.8	44.2	43.5	43.5
10	42.5	42.3	41.5	42.2	43.6	44.0	42.0	40.5
11	39.0	40.2	40.0	41.5	44.5	45.5	41.5	38.5
12	37.0	35.0	30.8	37.4	50.0	52.5	47.5	44.0
13	42.0	37.5	34.0	42.5	53.6	53.8	51.0	48.5
14	47.3	47.0	47.2	51.6	57.5	56.0	52.3	48.0
15	46.0	42.5	40.0	43.5	48.5	51.5	48.5	45.5
16	42.0	41.4	45.9	48.0	50.6	51.2	43.6	37.0
17	33.0	33.0	28.0	30.0	31.5	32.0	29.0	28.0
18	26.8	22.5	22.8	27.6	36.5	35.0	34.6	34.5
19	36.5	37.0	41.0	42.6	51.0	56.0	53.0	52.0
20	50.0	48.5	49.0	46.5	44.0	43.0	40.8	41.0
21	41.5	41.0	40.6	41.5	43.0	45.7	43.2	39.5
22	35.2	32.0	28.6	29.5	35.0	35.0	30.5	29.5
23	31.5	33.5	35.0	34.0	37.0	38.3	39.8	41.6
24	45.6	47.3	45.5	41.5	43.5	40.5	36.0	32.6
25	30.2	27.5	26.8	29.8	38.0	37.0	33.0	30.8
26	31.2	33.0	36.2	37.7	41.2	42.3	43.0	43.6
27	42.5	39.6	36.8	41.7	42.5	41.5	37.3	33.5
28	30.5	31.6	34.0	36.0	42.0	43.5	43.5	43.8
29	43.5	43.2	43.5	43.8	39.5	37.0	30.0	24.0
30	21.0	20.0	12.8	18.2	25.6	25.3	21.0	19.0
Hourly means.	37.2	36.1	35.3	38.1	42.5	42.9	40.0	37.8

Mean Time.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	°	°	°	°	°	°	°	°
December 1	17.5	15.9	16.3	20.0	27.8	27.8	26.5	24.5
2	25.0	25.2	24.0	25.5	32.5	33.0	27.8	27.0
3	24.4	23.8	25.7	28.4	31.2	31.0	29.8	30.7
4	31.0	30.9	32.2	34.0	37.0	39.0	39.5	39.5
5	39.8	39.5	40.0	39.0	40.0	38.8	37.6	37.8
6	38.0	36.8	37.0	37.0	39.5	39.6	38.8	37.8
7	38.0	37.8	37.8	39.0	40.5	40.6	40.4	42.0
8	41.0	40.0	39.5	40.0	41.5	43.0	43.0	42.4
9	42.5	42.0	41.0	41.0	43.0	42.2	39.6	37.2
10	35.0	32.0	32.0	31.8	34.4	35.0	31.0	29.2
11	31.0	30.0	29.5	31.0	35.5	36.0	36.5	36.0
12	35.6	32.5	31.0	34.0	38.5	36.0	33.5	30.5
13	31.0	28.5	29.3	34.0	37.5	35.0	31.0	30.0
14	30.8	30.0	29.0	32.5	32.5	32.5	27.5	25.3
15	22.0	21.5	20.5	25.8	32.2	30.7	32.0	32.5
16	32.5	31.5	27.0	27.5	40.0	39.5	38.5	34.5
17	37.0	36.0	31.5	30.5	25.0	21.6	18.0	. .
18	. .	. .	. .	. .	. .	. .	. .	. .
19	. .	. .	. .	22.0	29.0	29.8	. .	. .
20	. .	. .	. .	18.0	29.8	33.8	30.5	29.5
21	29.0	25.5	23.8	27.6	40.7	46.0	43.5	42.0
22	46.0	47.0	50.0	48.8	58.0	58.2	52.0	43.5
23	42.4	40.5	43.5	45.0	59.2	60.3	55.0	53.0
24	48.5	47.6	46.0	41.5	40.5	42.0	42.5	42.0
25	41.4	40.5	40.5	42.0	45.0	54.0	51.0	46.3
26	44.0	41.5	42.5	42.0	43.5	43.0	42.8	43.0
27	44.5	42.5	48.0	41.0	42.0	41.0	36.0	33.5
28	32.0	31.5	32.0	31.5	33.6	35.0	35.8	36.8
29	37.0	37.8	37.5	38.0	39.8	41.5	41.3	41.2
30	41.5	40.5	40.5	42.5	46.0	45.6	45.5	45.0
31	45.3	43.7	45.5	46.0	48.0	50.2	50.5	51.6
Hourly means.	35.8	34.7	34.7	34.5	38.7	39.3	37.8	37.3

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
January 1	19.0	18.0	14.0	38.0	62.5	56.0	26.0	24.0
2	26.0	. .	. .	32.0	44.0	51.0	56.0	31.0
3	31.0	30.0	28.0	39.0	98.0	102.0	52.5	33.0
4	33.0	33.0	33.5	37.0	52.8	85.5	61.5	30.5
5	28.0	31.0	31.0	33.0	38.0	70.0	48.5	25.0
6	21.0	19.0	17.0	34.0	65.2	42.0	40.5	28.0
7	28.0	29.5	31.5	35.0	40.5	35.5	35.5	33.0
8	33.0	30.0	24.5	70.0	91.5	89.5	45.5	26.0
9	29.0	30.5	31.0	33.0	44.0	56.0	50.0	16.5
10	8.5	3.2	1.0	17.5	86.5	95.0	45.5	11.5
11	12.0	9.8	6.0	18.0	93.5	98.0	57.0	18.0
12	19.0	18.5	25.0	32.0	56.0	56.0	44.0	. .
13	. .	. .	. .	. .	44.5	46.0	46.0	31.5
14	32.0	30.0	28.0	30.0	95.5	100.0	62.0	23.5
15	25.3	23.0	20.0	27.0	95.0	94.0	51.0	17.0
16	19.0	14.0	20.0	26.0	45.0	47.5	41.0	26.0
17	25.0	19.0	18.0	24.5	90.0	40.5	25.0	23.0
18	23.0	22.5	23.0	31.7	39.0	40.0	52.0	26.0
19	25.5	23.0	18.5	28.0	93.5	98.0	37.0	19.5
20	21.5	16.0	11.0	15.5	94.5	96.0	52.0	22.0
21	19.0	22.0	21.0	32.5	51.0	59.0	39.0	32.0
22	33.0	32.5	31.5	36.0	90.0	116.5	78.0	44.0
23	32.5	28.5	25.0	31.6	112.0	110.0	65.0	27.5
24	23.0	24.0	29.5	32.0	39.0	40.5	42.0	32.5
25	30.5	28.0	25.0	30.0	103.0	104.0	75.0	26.0
26	26.0	24.0	20.0	36.0	95.0	101.5	60.0	20.0
27	20.0	16.5	16.0	35.2	83.0	88.0	47.0	35.0
28	32.8	32.8	33.5	42.0	52.0	53.0	49.5	39.0
29	35.0	34.5	35.0	37.0	42.0	41.0	37.0	33.0
30	32.5	30.5	25.5	34.5	98.0	108.0	49.5	35.0
31	34.0	33.2	33.0	35.0	41.0	44.0	43.0	31.0
Hourly means.	25.9	24.4	23.3	32.8	70.1	73.0	48.8	27.4

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
February 1	30.0	27.0	20.0	27.0	99.0	101.2	67.5	23.5
2	23.5	22.0	21.5	44.0	109.5	110.0	74.0	39.5
3	37.0	36.0	41.0	46.5	. .	66.0	70.5	46.0
4	38.5	31.5	25.0	37.0	85.5	96.5	66.0	19.0
5	14.0	14.0	12.0	20.0	89.5	101.0	61.0	17.0
6	17.5	16.5	16.5	34.0	97.5	98.0	60.0	29.0
7	24.0	20.0	16.0	19.0	33.0	40.5	45.0	10.0
8	8.0	7.5	7.0	18.0	96.0	95.0	. .	18.0
9	12.0	6.0	−1.0	24.5	35.0	87.0	6.0	0.0
10	−3.0	−4.0	−3.0	11.0	90.0	92.0	80.0	14.0
11	18.0	18.5	23.0	37.0	41.0	54.0	54.0	30.0
12	25.0	19.0	13.0	23.0	96.0	101.0	48.0	27.0
13	25.0	22.0	22.5	28.0	92.0	92.0	80.0	28.5
14	25.0	26.0	28.0	43.0	95.0	97.0	81.0	27.0
15	16.0	11.5	8.0	17.5	89.0	90.5	74.0	16.0
16	11.0	6.5	9.0	20.5	90.0	88.5	78.0	15.0
17	12.0	10.0	8.0	34.0	82.0	102.5	91.0	33.0
18	22.0	13.5	8.0	71.0	86.0	89.0	80.0	17.0
19	18.0	19.5	21.0	28.0	60.0	60.0	48.0	27.0
20	27.0	29.5	. .	. .	42.0	52.0	47.0	30.0
21	25.0	24.5	20.0	48.0	98.0	102.0	75.0	33.5
22	29.0	28.0	23.0	37.0	102.0	106.0	100.0	40.0
23	38.0	35.0	34.0	52.0	100.0	102.0	59.0	45.0
24	47.5	46.0	44.0	53.0	72.0	85.5	62.5	50.5
25	52.0	50.0	47.0	53.0	64.0	59.5	58.0	54.0
26	37.0	32.0	29.0	36.0	108.0	114.0	106.0	36.5
27	38.5	32.5	31.5	54.0	106.0	112.0	98.0	31.5
28	27.0	24.0	22.0	34.0	94.0	98.0	95.0	22.0
Hourly means.	24.8	22.3	20.2	35.2	83.4	89.0	68.9	27.8

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
March 1	24.0	22.0	21.5	30.0	44.0	41.0	. .	. .
2	45.0	32.0	30.0	53.0	107.5	112.0	105.0	40.0
3	37.5	36.0	32.0	. .	35.2	36.2	. .	. .
4	. .	. .	. .	79.0	92.0	95.0	95.0	36.0
5	25.5	25.0	25.0	36.0	59.0	61.0	50.0	31.0
6	31.0	31.5	31.6	56.0	84.5	89.5	87.0	46.0
7	33.0	32.5	32.0	35.0	39.0	40.0	35.0	33.0
8	32.8	32.0	31.0	74.0	85.0	112.0	100.0	33.0
9	25.0	24.0	28.0	44.0	71.0	87.0	97.0	38.0
10	35.0	31.5	33.0	90.1	113.5	116.1	111.0	36.0
11	32.0	27.0	26.0	87.5	114.0	117.0	107.0	45.5
12	44.0	40.5	35.0	96.0	123.5	125.0	112.0	58.0
13	47.0	45.0	39.5	46.0	71.5	117.0	103.2	46.0
14	35.0	35.0	35.5	43.5	74.0	108.0	80.0	53.0
15	47.0	46.0	46.0	53.0	79.0	110.0	119.0	61.0
16	56.0	54.0	47.0	65.0	123.0	124.0	107.0	49.5
17	47.0	33.0	33.5	100.0	104.0	105.5	96.0	26.0
18	20.5	20.0	21.0	89.0	105.0	109.0	101.0	31.0
19	30.0	32.0	30.0	48.0	94.0	86.0	73.2	35.8
20	34.0	30.5	33.0	37.0	47.0	44.0	41.0	36.0
21	35.0	30.0	29.0	44.0	71.5	74.0	52.0	30.0
22	24.0	22.5	20.0	88.0	103.0	105.0	99.0	28.5
23	24.0	21.0	17.5	91.0	105.0	108.0	100.0	32.0
24	30.0	31.0	32.0	36.0	62.0	103.0	102.0	42.0
25	33.0	25.0	27.0	95.0	108.0	110.5	106.0	35.0
26	27.5	28.0	29.0	58.0	81.0	93.6	88.0	53.5
27	54.0	53.0	48.0	60.0	125.0	127.2	116.5	48.5
28	40.0	34.5	28.0	106.0	128.5	125.0	115.0	48.0
29	46.0	40.0	36.0	50.0	95.0	118.0	94.0	50.0
30	46.0	43.5	41.0	88.0	120.0	135.5	122.0	57.0
31	51.0	48.5	48.0	80.0	120.5	128.5	117.5	62.0
Hourly means.	36.3	33.5	32.2	65.2	89.8	98.8	94.2	42.1

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
April 1	58.0	55.5	48.0	117.0	129.5	136.5	125.0	67.5
2	61.0	59.0	56.0	77.6	124.0	131.0	70.5	56.0
3	53.0	45.0	40.0	49.0	115.5	107.0	68.5	47.0
4	42.0	41.5	38.0	106.0	123.0	124.0	120.0	60.0
5	41.0	40.0	44.0	106.0	121.0	124.0	118.0	59.0
6	47.0	44.0	34.0	108.0	123.0	126.2	121.5	57.0
7	47.0	45.0	46.0	95.5	118.2	119.5	105.0	48.0
8	40.0	40.0	40.0	56.0	83.0	112.0	105.1	55.0
9	45.0	45.0	45.0	68.5	89.0	81.0	60.5	51.0
10	49.0	48.0	49.0	108.5	114.0	111.0	81.0	55.0
11	48.8	45.0	49.0	81.0	118.0	103.5	79.0	57.0
12	55.0	53.5	52.0	56.0	59.0	58.5	54.0	45.0
13	41.0	39.0	35.0	60.0	69.5	111.6	120.5	38.5
14	36.5	35.0	32.0	110.0	123.5	124.5	111.2	58.0
15	41.0	39.0	36.0	107.5	130.2	120.0	119.5	56.5
16	57.5	50.0	42.0	70.8	132.0	120.0	90.0	40.0
17	33.0	25.0	21.0	93.0	112.0	111.5	91.0	35.0
18	29.0	28.0	24.0	88.0	110.5	106.0	90.0	30.0
19	23.0	21.5	20.0	88.0	125.5	120.0	114.5	49.0
20	46.0	40.0	38.5	50.2	127.0	120.0	116.0	62.0
21	35.0	32.5	32.0	101.5	115.0	117.0	114.5	63.0
22	31.0	30.0	26.0	102.0	115.0	112.0	62.5	36.0
23	35.0	33.0	32.0	105.5	120.2	118.0	62.5	37.5
24	35.0	35.0	35.0	104.0	58.2	44.0	86.5	35.0
25	35.5	31.5	35.0	108.0	122.0	120.0	71.5	45.0
26	31.5	33.0	35.0	104.0	91.5	115.5	57.5	52.5
27	53.0	51.0	49.0	60.5	59.5	53.0	49.0	49.0
28	49.0	47.0	47.0	52.0	60.0	55.5	50.0	37.0
29	35.0	33.5	38.5	108.0	125.0	70.0	75.0	48.0
30	52.0	50.0	51.0	105.0	130.0	129.0	128.5	49.0
Hourly means.	42.8	40.5	39.0	88.2	108.1	106.7	90.6	49.2

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
May 1	46.0	44.0	50.0	48.0	75.0	105.0	52.0	47.5
2	42.0	38.0	43.5	111.0	98.0	122.0	73.5	40.0
3	34.0	29.0	40.0	110.0	123.0	122.0	58.0	47.5
4	48.0	45.0	44.0	52.0	60.0	51.0	69.0	37.0
5	36.0	32.0	38.5	114.0	128.0	120.0	62.0	51.0
6	50.0	49.0	49.0	102.0	107.5	124.5	82.0	50.0
7	42.5	39.0	46.0	114.0	129.0	128.0	73.5	50.0
8	49.0	48.0	51.0	91.4	93.5	82.0	68.0	57.0
9	54.5	53.0	58.0	106.1	135.0	132.5	95.5	68.3
10	65.5	62.0	72.0	68.0	80.0	90.5	90.0	48.0
11	45.0	43.5	48.0	120.2	138.0	133.0	95.0	58.0
12	54.0	55.0	61.0	121.2	136.0	130.0	86.0	56.5
13	50.5	47.0	49.5	120.5	131.0	123.0	67.5	65.0
14	54.0	50.0	48.0	116.0	131.5*	131.0	92.0	57.0
15	53.0	48.0	55.0	125.0	136.0	67.0	56.0	59.0
16	43.5	36.5	42.5	117.0	122.0	126.0	86.0	39.0
17	42.0	38.0	38.0	119.0	129.0	132.0	58.8	38.0
18	38.5	35.0	42.0	114.0	89.0	91.0	63.5	42.5
19	38.0	38.5	41.0	116.5	110.0	140.0	69.2	44.0
20	44.5	52.5	55.5	123.0	141.0	133.0	87.0	52.0
21	52.8	50.9	59.0	133.0	136.0	126.0	80.0	64.0
22	62.0	60.0	69.0	128.0	147.0	121.0	82.0	61.0
23	61.0	58.0	64.0	128.0	146.0	143.0	89.0	88.0
24	63.2	59.0	69.0	99.0	129.5	96.0	70.0	68.0
25	67.0	66.0	67.5	82.0	123.0	141.4	76.5	64.0
26	65.1	63.0	74.0	130.0	141.0	126.0	86.0	63.0
27	60.0	55.5	58.0	124.5	142.0	134.4	86.0	60.0
28	52.0	47.0	62.0	122.0	140.5	136.0	80.0	51.0
29	47.5	45.0	63.0	129.0	142.2	118.0	71.0	63.0
30	56.5	50.5	53.5	126.0	141.0	140.0	93.0	51.0
31	47.0	44.0	76.0	127.0	141.5	137.0	80.5	57.0
Hourly means.	50.4	47.8	54.4	110.8	123.3	119.4	76.7	54.7

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
June 1	57.0	55.0	66.0	124.5	134.0	132.0	74.0	61.0
2	62.0	62.0	64.0	78.2	87.5	77.5	70.0	64.0
3	64.0	62.0	63.0	86.0	101.5	134.0	76.5	62.0
4	59.0	61.0	70.0	129.2	131.0	140.0	85.0	64.0
5	60.0	58.0	65.0	125.0	136.0	93.2	73.0	64.0
6	62.8	63.0	73.0	117.0	100.0	123.0	101.0	69.0
7	67.0	66.5	73.0	107.0	87.0	61.0	62.0	54.0
8	54.0	50.0	65.0	105.0	127.0	108.5	72.0	62.0
9	59.6	54.0	63.8	100.5	114.0	128.0	75.2	55.0
10	53.0	53.0	75.0	114.0	135.0	133.0	102.0	62.0
11	59.0	58.5	79.0	127.0	140.5	140.0	85.0	68.0
12	64.2	63.0	79.0	70.0	69.0	76.0	74.0	68.0
13	61.5	58.0	54.5	118.0	131.0	127.0	74.0	52.0
14	51.0	52.0	72.5	127.5	131.0	130.5	74.5	63.0
15	56.0	52.0	80.0	126.0	110.5	89.0	66.0	64.0
16	63.0	59.5	63.0	112.0	124.5	102.0	73.0	59.0
17	55.0	52.0	63.0	129.0	139.0	127.0	77.0	69.5
18	63.0	63.0	67.0	81.0	87.2	87.0	74.0	54.0
19	50.0	50.0	55.1	119.0	136.5	129.0	77.5	61.0
20	59.0	57.0	64.5	129.0	137.0	137.0	83.0	59.0
21	55.0	53.2	59.0	128.0	142.0	136.0	99.0	64.0
22	60.0	58.0	65.0	127.0	147.0	113.5	85.0	72.0
23	71.5	70.0	73.0	116.0	149.5	145.0	90.2	72.0
24	66.0	66.0	76.0	138.5	149.0	149.2	102.0	71.0
25	68.0	68.0	73.0	140.0	141.0	149.0	86.0	74.0
26	71.0	68.0	91.0	140.5	155.0	78.2	97.0	76.0
27	72.0	69.8	72.5	140.0	155.0	153.0	85.0	74.0
28	69.5	67.0	98.0	144.0	110.0	110.0	72.0	71.0
29	67.0	67.0	75.0	133.2	146.0	135.0	107.0	78.0
30	69.5	68.0	72.5	146.0	130.0	120.0	96.2	70.0
Hourly means.	61.6	60.1	70.6	119.2	126.4	118.7	82.2	65.2

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
July 1	68.0	65.0	87.0	133.0	145.0	106.0	87.5	66.0
2	68.0	63.0	66.0	92.0	110.0	83.5	72.2	63.5
3	59.0	62.5	70.0	104.0	121.2	119.5	80.5	68.0
4	65.0	66.0	70.0	100.0	105.5	128.0	87.5	74.0
5	70.0	69.0	78.0	102.5	145.0	149.0	112.0	75.0
6	71.0	68.0	77.1	136.0	129.0	148.0	80.0	76.5
7	73.0	71.0	78.0	128.0	117.0	124.0	105.0	76.0
8	69.0	68.0	67.2	114.0	148.0	115.0	106.5	71.5
9	67.0	65.5	75.0	94.0	120.5	111.0	79.0	72.8
10	71.5	72.0	77.0	123.0	120.0	112.0	78.0	73.0
11	69.5	70.0	75.0	95.0	151.0	121.0	104.0	71.5
12	65.0	67.5	74.0	79.0	87.0	80.0	74.0	60.0
13	57.0	55.0	65.5	121.0	152.2	148.2	105.5	68.0
14	67.0	65.0	74.5	104.0	139.2	97.0	90.0	68.0
15	65.5	63.5	72.0	. .	158.0	120.0	83.2	72.0
16	71.0	69.0	71.0	128.0	146.0	136.0	109.0	75.0
17	70.5	69.0	74.0	73.0	144.0	79.0	100.0	72.0
18	70.6	70.0	75.5	137.0	145.0	119.0	97.0	75.0
19	65.0	63.0	62.0	107.0	137.0	132.0	74.1	67.0
20	64.0	63.0	66.5	96.0	85.0	80.0	76.5	69.0
21	66.0	66.4	69.0	123.0	106.0	125.2	87.1	70.0
22	67.0	65.0	70.0	128.0	122.0	83.5	80.0	73.0
23	72.5	71.0	74.5	126.0	113.0	139.5	106.5	71.0
24	69.0	68.0	70.5	125.5	134.0	133.0	91.0	65.0
25	64.0	63.0	69.0	89.0	138.0	123.0	80.0	70.0
26	67.0	65.0	75.0	135.0	138.0	144.0	95.0	72.0
27	67.0	66.0	76.0	138.0	136.0	71.4	107.0	71.0
28	68.0	68.0	75.0	81.0	92.0	135.0	77.0	71.0
29	66.0	67.0	69.0	75.0	82.0	90.0	80.0	68.0
30	65.2	65.0	70.0	109.0	139.0	92.0	90.0	69.8
31	70.2	70.0	76.0	77.0	100.0	90.0	75.0	67.6
Hourly means.	67.3	66.4	72.5	109.1	125.9	114.0	89.3	70.4

Mean Time.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.	°	°	°	°	°	°	°	°
August 1	67.5	67.0	65.5	90.0	105.5	80.0	65.0	63.0
2	65.5	64.0	65.5	71.5	70.0	70.0	62.0	60.0
3	61.0	59.0	63.0	83.0	93.5	90.5	68.5	68.0
4	67.2	69.0	70.0	88.0	139.0	104.5	88.1	71.0
5	67.0	60.5	68.0	128.0	140.5	139.0	87.0	68.0
6	66.5	62.5	63.0	128.0	141.0	137.0	82.0	71.5
7	71.0	68.5	70.0	92.0	113.1	107.5	84.0	71.0
8	68.0	67.5	69.0	95.0	127.0	111.0	78.0	67.0
9	63.0	61.0	63.0	125.0	140.0	127.0	80.0	66.0
10	64.0	63.0	67.0	126.0	146.0	143.0	77.0	72.0
11	69.0	68.0	70.0	104.0	128.5	141.5	80.0	70.0
12	69.0	67.0	72.0	79.0	97.0	135.0	78.5	74.0
13	72.0	71.0	71.0	99.0	117.5	110.0	77.0	67.5
14	65.0	64.0	66.0	101.0	127.5	96.0	74.5	73.5
15	68.5	66.0	70.0	95.0	134.5	99.0	77.2	74.5
16	70.0	70.0	72.0	129.0	126.5	131.0	77.5	76.0
17	71.5	72.0	71.5	104.5	150.0	150.0	150.0	74.0
18	72.0	70.0	76.0	92.5	149.0	148.0	81.0	69.5
19	68.5	67.0	68.0	100.5	140.6	137.5	78.0	71.0
20	65.2	62.0	65.0	125.5	130.0	129.0	71.0	62.5
21	60.0	59.0	60.5	128.0	142.5	138.0	72.1	63.0
22	60.0	60.5	65.0	97.5	117.0	87.5	74.0	68.0
23	69.0	66.5	63.5	64.5	70.5	69.0	65.0	62.5
24	62.0	61.5	63.0	64.5	66.0	68.5	64.0	59.0
25	58.5	58.0	61.0	121.0	119.0	115.0	69.0	57.0
26	55.0	53.0	55.0	120.5	135.0	136.0	131.0	73.5
27	57.0	53.0	55.0	104.0	130.5	142.0	95.5	66.0
28	66.5	65.0	64.8	74.1	83.0	77.2	71.0	70.0
29	68.5	67.0	67.2	72.0	72.0	69.5	77.0	66.5
30	64.0	64.0	65.0	124.5	138.0	132.0	79.0	65.0
31	64.0	63.0	64.0	124.0	141.0	132.0	81.0	69.5
Hourly means	65.6	64.1	66.1	101.6	120.3	114.6	80.4	68.0

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1875.	°	°	°	°	°	°	°	°
September 1	66.0	65.0	65.0	125.0	117.0	121.0	125.0	66.0
2	64.0	62.0	63.0	124.0	140.2	136.0	77.4	71.5
3	69.0	66.8	67.5	127.0	141.5	140.5	81.1	73.0
4	69.5	67.0	69.0	120.0	138.5	137.5	75.0	70.0
5	63.0	59.0	58.0	128.0	136.0	135.0	74.0	64.0
6	61.5	60.0	59.5	128.0	140.0	138.0	73.0	64.0
7	59.0	55.0	55.0	127.0	138.0	133.2	66.0	60.0
8	57.0	55.0	56.0	123.0	134.5	135.0	79.0	61.0
9	61.0	60.0	59.0	126.0	142.0	133.5	75.0	67.0
10	68.0	67.0	68.0	136.5	105.5	85.0	62.0	55.0
11	47.0	44.0	45.0	114.0	127.0	122.0	60.0	49.0
12	46.0	50.0	55.0	88.0	99.0	90.0	66.0	62.0
13	61.0	60.0	60.5	95.0	132.1	83.0	69.0	59.5
14	63.0	61.5	63.0	84.5	90.0	135.0	65.5	59.0
15	55.0	56.0	62.0	120.0	145.6	113.5	68.0	66.5
16	66.5	60.5	61.5	82.5	74.8	70.0	66.0	63.0
17	61.0	59.5	61.5	106.0	114.5	81.0	61.0	55.0
18	49.0	45.0	46.0	89.0	92.0	68.0	49.5	46.0
19	45.0	43.0	48.5	60.5	73.0	99.0	55.0	46.0
20	45.2	48.0	48.0	95.0	94.0	102.0	53.5	49.5
21	41.4	39.0	43.9	106.5	126.5	110.5	48.0	48.0
22	45.0	45.5	45.0	107.5	92.5	109.5	49.5	47.0
23	46.0	45.0	42.2	79.5	99.5	90.5	52.0	45.0
24	40.2	37.8	38.0	99.0	122.0	120.5	49.5	44.0
25	40.5	40.0	38.2	110.0	125.0	112.0	58.0	56.0
26	56.0	53.0	52.5	112.0	93.5	118.0	49.0	43.0
27	39.0	40.0	40.0	114.0	133.5	125.0	57.0	46.2
28	46.5	45.0	44.0	115.0	135.0	127.0	66.0	54.5
29	48.0	52.0	51.5	82.0	132.0	121.3	57.0	52.5
30	54.0	51.0	52.0	115.0	102.0	101.0	64.0	55.5
Hourly means.	54.4	53.0	53.9	107.9	117.8	113.4	65.0	56.6

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1875.	°	°	°	°	°	°	°	°
October 1	59.0	60.0	56.5	82.0	77.0	78.5	55.0	49.0
2	41.0	37.0	39.0	100.0	126.0	119.0	45.0	44.0
3	41.0	38.5	37.0	100.0	129.0	76.0	52.5	45.0
4	46.0	45.5	45.0	84.0	106.0	81.5	54.3	52.0
5	52.0	51.0	50.0	95.5	135.0	99.0	59.0	55.5
6	54.0	54.0	56.5	73.0	111.0	114.0	65.2	63.0
7	64.0	60.0	53.0	88.0	118.5	106.0	49.5	40.0
8	41.0	37.0	35.5	109.0	125.5	90.0	56.0	59.0
9	51.5	45.0	41.0	106.0	121.0	84.0	50.5	50.0
10	48.0	52.0	53.0	96.0	97.0	94.0	61.8	58.0
11	48.2	52.0	47.0	52.5	61.0	54.0	46.0	45.4
12	44.0	41.0	36.5	103.5	87.5	69.0	37.5	31.0
13	31.0	29.0	31.0	75.5	113.0	67.0	41.0	33.0
14	29.0	28.0	28.0	67.0	75.0	67.0	46.0	46.0
15	49.0	50.0	49.0	95.0	124.0	78.0	52.2	54.0
16	51.0	52.0	50.0	48.0	48.0	59.0	44.0	40.0
17	36.5	36.0	31.2	101.5	118.0	81.0	41.0	39.0
18	38.0	34.0	33.5	56.0	85.0	71.0	52.0	49.0
19	43.0	40.5	35.5	77.0	75.0	77.5	38.0	34.0
20	32.0	28.0	29.0	97.0	116.5	65.5	41.0	38.5
21	38.0	34.5	33.0	98.5	127.5	83.0	53.0	53.0
22	48.0	44.0	41.5	92.5	124.0	78.0	52.0	49.0
23	46.5	43.0	44.5	92.5	104.0	83.0	60.0	53.0
24	50.0	47.0	45.0	77.5	125.0	90.0	52.2	47.0
25	46.0	44.0	38.5	99.5	129.5	80.0	58.0	57.0
26	47.0	45.0	42.5	105.0	129.5	82.0	66.0	52 0
27	51.0	47.0	40.0	103.0	120.2	120.5	40.0	35.5
28	36.0	34.0	30.0	93.0	115.0	117.0	95.5	52.0
29	48.0	44.0	40.5	102.0	115.0	115.0	89.0	56.2
30	58.0	56.0	50.0	70.0	71.0	80.0	45.0	44.0
31	50.0	43.0	36.0	95.0	65.0	52.0	35.0	36.5
Hourly means.	45.7	43.6	41.2	88.2	105.6	84.2	52.7	47.1

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1875.	°	°	°	°	°	°	°	°
November 1	33.0	30.0	27.5	94.0	72.0	53.0	39.0	38.0
2	38.5	30.0	28.0	92.0	106.0	51.0	33.5	29.6
3	25.5	25.5	21.0	45.0	40.5	35.0	35.0	34.0
4	38.0	39.0	38.0	40.5	61.0	50.0	39.0	34.0
5	32.0	31.0	32.0	50.5	45.0	45.5	28.3	26.0
6	23.5	22.5	21.5	82.0	105.0	51.0	31.0	27.5
7	30.0	29.0	30.5	50.0	67.5	54.0	44.2	43.0
8	40.0	40.0	40.0	49.0	67.2	57.5	39.0	31.0
9	27.0	25.0	23.0	87.0	100.0	55.0	45.0	43.5
10	42.0	41.5	40.0	43.5	50.0	52.0	39.5	35.0
11	35.8	39.0	37.0	93.0	82.0	53.0	35.5	32.5
12	28.0	26.0	26.0	87.0	109.5	66.0	38.0	41.0
13	34.0	32.0	30.0	92.2	114.0	70.5	44.0	44.0
14	46.5	45.3	47.0	71.0	100.5	60.5	45.0	41.0
15	41.0	36.5	38.0	55.0	76.2	57.5	50.0	40.0
16	36.0	35.0	45.0	49.0	52.0	58.5	44.5	37.0
17	34.0	32.0	28.0	76.0	62.0	40.0	27.0	23.5
18	19.0	16.5	15.0	71.0	92.0	49.5	36.5	38.0
19	35.0	35.0	39.0	90.0	82.0	69 2	53.0	51.0
20	47.0	42.0	49.0	46.0	50.0	48.0	39.0	39.0
21	40.0	40.0	39.5	41.5	47.5	50.0	37.0	37.0
22	33.0	31.0	22.0	77.0	82.7	39.2	27.2	21.0
23	31.5	33.5	34.0	37.0	39.0	39.0	39.0	42.0
24	44.0	45.2	42.0	54.0	108.0	52.0	33.5	31.0
25	28.5	22.0	20.0	76.0	97.0	42.0	31.0	24.8
26	30.5	33.0	36.0	38.0	47.0	44.0	42.0	42.6
27	40.0	36.0	33.0	65.0	98.0	49.2	35.0	29.5
28	25.2	27.0	34.0	49.2	60.0	49.0	42.5	42.0
29	43.0	42.0	40.2	57.0	67.0	51.5	31.0	24.0
30	19.5	20.0	10.5	58.4	83.0	40.0	17.0	14.5
Hourly means.	34.0	32.7	32.2	63.8	75.4	51.0	37.3	34.5

Mean Time.	0h.	3h.	6h.	9h.	Noon.	3h.	6h.	9h.
1875.	°	°	°	°	°	°	°	°
December 1	12.5	12.0	13.0	64.6	70.6	32.0	26.0	25.0
2	25.5	23.0	19.0	55.5	86.6	34.0	22.0	22.0
3	19.5	19.0	25.0	35.5	39.0	33.5	29.0	30.0
4	31.0	30.6	32.0	36.0	52.6	50.0	39.0	37.6
5	38.0	37.8	39.0	41.5	45.0	39.5	36.5	36.0
6	37.0	36.0	36.0	40.5	50.0	43.0	38.0	36.5
7	37.0	36.0	35.5	39.0	44.0	41.0	39.0	41.0
8	40.0	39.5	39.0	41.8	47.2	49.5	42.0	41.0
9	41.0	40.5	39.5	46.5	50.2	47.0	38.2	37.5
10	30.0	28.0	27.0	39.0	61.0	42.5	26.0	26.0
11	29.0	28.5	27.5	73.0	55.0	40.0	35.0	34.2
12	34.0	28.0	24.0	71.0	95.5	43.5	34.5	24.0
13	27.0	24.0	28.0	74.0	98.0	46.5	31.0	29.0
14	32.0	26.0	24.0	74.0	43.0	36.5	25.0	21.6
15	16.0	15.0	14.5	69.0	41.0	33.0	28.0	29.0
16	26 0	25.0	20.0	59.5	94.0	48.6	38.5	32.5
17	35.5	35.0	27.0	39.6	44.0	28.0	14.5	12.5
18	11.0	9.5	9.0	65.0	82.0	28.0	9.0	15.0
19	16.0	14.0	14.0	31.2	98.5	98.0	17.0	14.0
20	11.0	12.0	17.0	55.0	84.6	39.0	26.5	25.0
21	26.0	20.5	19.0	67.0	96.0	61.0	41.0	40.0
22	47.0	47.0	48.0	60.0	105.0	66.0	47.0	37.0
23	38.0	38.0	40.2	78.0	106.0	70.0	54.5	53.0
24	47.0	46.0	47.0	40.5	43.5	42.0	41.0	41.0
25	40.4	40.0	40.0	43.0	58.0	61.0	47.0	41.0
26	42.5	38.5	41.0	45.0	53.0	45.0	40.0	41.5
27	42.8	42.8	47.0	44.3	99.5	46.5	29.0	30.0
28	29.0	30.5	31.0	33.0	38.0	37.0	34.6	35.0
29	36.0	36.5	36.0	41.5	44.0	42.0	40.0	40.0
30	40.0	38.5	39.0	45.5	66.0	49.0	49.0	44.0
31	45.0	44.0	45.0	48.0	58.0	53.0	49.0	50.2
Hourly means.	31.7	30.3	30.4	51.5	66.1	46.9	34.4	32.9

MONTHLY MAXIMUM AND MINIMUM CORRECTED READINGS OF THE BAROMETER AT TH HOURS OF OBSERVATION IN 1875.

Month.	Day and Hour.	Maximum.	Day and Hour.	Minimum.	Range.
	d. h.	in.	d. h.	in.	in.
January	1 0	30.700	29 3 p.m.	29.546	1.154
February	10 9 a.m.	30.621	20 3 p.m.	29.380	1.241
March	23 9 a.m.	30.402	20 3 p.m.	29.447	0.955
April	6 9 a.m.	30.329	16 noon.	29.509	0.820
May	17 9 a.m.	30.294	2 0	29.384	0.910
June	4 9 a.m.	30.158	7 9 a.m.	29.574	0.584
July	8 9 a.m.	30.177	16 6 a.m.	29.593	0.584
August	24 noon.	30.223	18 3 p.m.	29.662	0.561
September	24 9 a.m.	30.322	19 6 a.m.	29.566	0.756
October	13 9 a.m.	30.451	16 9 a.m.	29.469	0.982
November	22 9 p.m.	30.600	14 3 p.m.	29.488	1.112
December	20 9 a.m.	30.600	8 0	29.348	1.252

	in.
Maximum for the year	30.700
Minimum for the year	29.348
Range for the year	1.352
Mean monthly range	0.909

DAILY MEAN OF THE REDUCED READINGS OF THE BAROMETER IN 1875.

Day.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1	30.577	30.091	30.037	30.181	29.735	30.053	30.034	30.034	30.023	29.563	29.885	30.178
2	29.929	30.228	29.836	29.920	29.628	30.071	30.075	29.961	29.955	30.157	29.933	30.369
3	30.143	29.724	29.949	29.965	29.898	30.047	30.018	29.988	29.830	30.361	29.977	30.381
4	30.011	29.964	30.141	29.984	29.707	30.100	29.995	29.980	29.733	30.077	29.702	30.130
5	30.188	30.426	30.221	30.142	29.912	30.030	30.013	29.903	29.901	29.963	29.935	29.833
6	30.428	30.298	29.991	30.235	29.722	29.867	29.986	29.803	29.852	29.940	30.096	29.657
7	30.042	30.268	29.711	30.188	29.922	29.731	30.022	29.805	29.983	29.918	30.076	29.549
8	30.119	29.969	29.813	30.176	29.903	30.011	30.134	29.904	30.068	29.993	30.067	29.429
9	30.071	30.218	30.060	29.996	29.722	30.040	30.062	29.930	30.093	30.062	30.213	29.664
10	30.450	30.528	29.872	29.969	29.679	29.997	29.817	29.877	29.889	29.815	29.783	29.961
11	30.357	29.896	29.976	29.841	29.951	30.025	29.776	29.836	30.239	29.898	29.893	29.869
12	30.335	30.033	29.888	29.804	29.787	29.878	29.854	29.853	30.244	30.198	30.009	29.668
13	30.020	30.024	29.889	29.665	30.092	29.953	29.788	29.879	30.202	30.369	29.880	29.503
14	30.093	29.958	30.043	29.827	30.090	30.009	29.744	29.892	30.224	30.151	29.569	29.738
15	30.326	30.198	29.623	29.749	29.964	29.889	29.709	29.857	30.016	29.685	29.625	29.830
16	30.176	30.288	29.549	29.577	30.153	29.807	29.651	29.792	29.729	29.547	29.653	29.727
17	30.343	30.053	29.744	29.782	30.196	29.870	29.751	29.782	29.700	29.914	30.101	29.773
18	30.140	30.216	30.173	29.802	30.087	29.792	29.743	29.702	29.939	29.877	30.213	30.019
19	30.267	29.895	30.171	29.856	30.025	29.938	30.041	29.761	29.632	30.114	29.814	30.265
20	30.409	29.473	29.683	29.791	29.957	30.083	29.973	29.907	29.794	30.138	29.919	30.510
21	30.206	29.924	29.891	29.930	29.914	30.060	29.830	30.073	30.053	29.956	30.080	30.271
22	29.885	30.214	30.159	29.969	29.859	29.930	29.867	30.085	30.176	29.960	30.515	29.953
23	30.329	30.071	30.334	29.800	29.847	29.868	29.768	30.145	30.275	29.880	30.260	29.818
24	30.062	29.845	30.027	29.626	29.834	29.913	29.942	30.195	30.276	29.733	30.163	29.961
25	30.086	29.599	30.164	29.948	29.670	29.896	30.069	30.181	30.057	29.816	30.489	29.798
26	30.323	29.932	30.085	30.058	29.778	29.887	30.028	30.123	29.824	29.755	30.111	29.959
27	30.161	29.749	29.955	29.907	30.073	29.852	29.967	30.111	29.971	29.786	30.147	30.071
28	29.824	30.177	30.197	29.632	30.101	29.843	29.877	30.063	29.981	30.045	30.236	30.243
29	29.607	. .	30.268	29.804	29.871	29.943	29.829	29.983	29.917	29.867	30.015	30.146
30	29.818	. .	30.294	29.760	29.954	30.003	29.905	29.873	29.666	29.623	30.297	30.178
31	29.820	. .	30.297	. .	29.983	. .	29.975	29.903	. .	29.771	. .	30.240
	30.147	30.045	30.001	29.896	29.904	29.945	29.911	29.941	29.975	29.933	30.022	29.958

	in.
Mean barometric pressure for the year	29.973
Maximum daily pressure (occurred January 1) . . .	30.577
Minimum daily pressure (occurred December 8)	29.429
Range	1.148

MEAN DAILY TEMPERATURE FROM THE DRY-BULB THERMOMETER IN 1875.

Day.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
	°	°	°	°	°	°	°	°	°	°	°	°
1	20.6	26.4	25.1	60.3	51.2	68.5	78.1	67.3	75.1	61.8	40.4	22.0
2	31.1	33.4	37.5	59.6	49.9	65.6	69.0	63.8	75.9	51.9	40.5	27.2
3	33.5	44.3	30.2	44.7	49.9	67.6	72.1	66.0	79.8	53.9	34.7	27.4
4	34.0	26.4	29.0	51.8	46.9	71.6	76.1	74.3	78.1	57.9	39.8	34.9
5	29.7	19.0	29.1	52.9	52.3	71.7	80.9	75.3	72.7	62.3	36.1	38.3
6	22.5	25.5	34.7	51.2	57.5	73.2	81.6	76.4	74.3	63.4	37.8	37.6
7	30.9	12.2	32.4	48.2	55.1	65.3	80.8	74.7	68.9	58.3	40.5	38.6
8	29.1	13.2	34.8	46.9	56.6	63.6	77.5	71.9	69.3	54.4	43.6	40.5
9	26.2	6.6	32.6	49.1	66.0	64.5	75.0	73.2	73.2	54.4	40.6	41.3
10	7.6	8.7	38.1	53.7	65.7	67.4	79.0	75.1	71.4	60.0	42.2	33.9
11	18.5	26.6	40.2	55.0	63.4	73.1	79.2	75.5	56.0	49.3	44.5	34.0
12	25.3	24.8	51.6	49.2	66.2	68.6	69.8	74.9	61.5	45.5	41.7	36.0
13	28.4	28.2	43.0	38.5	59.6	62.5	76.0	75.5	67.8	42.5	48.4	34.3
14	31.4	29.7	41.8	44.9	61.6	63.5	77.7	73.4	68.4	43.9	53.5	30.2
1	19.4	16.1	52.4	51.5	60.7	67.0	79.1	73.9	68.8	56.1	47.0	26.8
16	22.7	15.0	51.4	47.6	54.4	68.3	80.3	76.5	67.1	48.1	46.0	34.9
17	22.0	24.5	32.0	31.1	53.8	69.8	77.7	75.7	65.0	45.9	33.4	27.9
18	24.5	16.6	30.2	29.3	52.5	66.0	82.3	73.2	51.9	48.5	32.4	17.0
19	21.0	23.4	34.2	34.9	55.7	66.7	71.9	73.4	51.7	44.8	48.6	21.9
20	18.5	30.2	32.7	43.6	67.3	70.5	69.3	71.9	56.4	45.3	45.5	24.8
21	25.7	31.4	29.7	39.7	70.0	70.6	76.0	71.3	53.2	55.0	42.0	36.8
22	38.2	37.8	27.3	40.7	73.7	73.8	75.0	70.6	53.9	59.4	34.8	52.3
23	32.2	44.0	28.9	46.2	74.6	79.1	78.9	65.1	53.3	58.2	36.6	53.1
24	29.0	48.3	35.8	43.4	71.3	82.4	76.5	62.3	53.0	57.7	43.8	44.3
25	30.6	50.3	35.1	47.9	71.6	82.8	73.9	66.3	56.9	60.0	34.7	44.4
26	25.0	39.0	41.8	52.1	75.1	82.1	80.6	66.4	56.9	61.3	38.1	42.1
27	26.3	36.2	53.6	51.2	70.2	83.0	76.7	66.8	57.0	50.7	40.6	42.6
28	35.7	24.7	46.3	46.8	67.5	79.6	72.2	68.2	61.2	48.3	38.8	33.3
29	34.3	. .	44.3	50.1	68.1	82.2	72.4	68.2	62.6	56.8	41.1	38.5
30	33.4	. .	49.4	60.1	66.2	78.1	75.1	73.9	64.9	54.5	20.3	42.7
31	33.0	. .	55.1	. .	67.0	. .	73.3	75.3	. .	41.2	. .	46.9
	27.1	27.2	38.1	47.4	62.0	71.6	76.3	71.5	64.2	53.3	40.2	35.7

Mean temperature for the year by dry thermometer . . . . 51°.2
Maximum mean daily temperature (occurred June 27) . . . . 83°.0
Minimum mean daily temperature (occurred February 9) . . . . . . 6°.6

TEMPERATURE FROM THE MAXIMUM AND MINIMUM THERMOMETERS IN 1875.

Day.	January.		February.		March.		April.		May.		June.		July.		August.		September.		October.		November.		December.	
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°	°
1	27.0	14.5	36.5	18.1	34.5	20.5	73.0	46.0	58.0	44.6	82.0	55.0	90.7	67.2	74.5	63.0	86.7	64.6	71.0	48.0	51.5	30.9	32.7	13.8
2	41.5	24.5	49.5	25.3	50.5	29.0	73.5	45.0	59.0	41.0	73.0	60.0	75.0	62.5	67.5	60.0	90.1	62.5	66.8	41.0	51.5	29.5	36.5	21.0
3	46.5	25.0	54.0	35.0	33.0	24.0	52.0	38.3	63.5	37.0	77.5	62.0	82.0	62.0	76.7	69.5	93.0	69.0	70.0	39.5	51.5	27.0	36.5	22.0
4	42.5	27.0	30.0	15.0	37.5	24.0	67.0	38.2	53.0	41.0	85.5	58.0	87.0	66.5	84.5	68.0	91.5	68.0	70.5	49.5	50.1	35.0	40.5	30.0
5	34.1	21.0	29.5	11.2	35.5	25.5	64.5	44.0	66.0	38.0	84.7	61.0	95.0	70.5	86.5	65.0	85.5	62.0	79.5	50.0	50.0	28.0	41.0	38.0
6	29.0	16.5	38.5	16.0	43.0	30.0	64.5	37.3	68.5	48.0	84.7	64.0	96.1	71.5	88.5	67.0	90.0	61.5	72.0	54.0	53.0	26.0	41.0	34.5
7	34.5	27.0	13.5	7.5	34.5	31.0	58.1	39.2	70.0	44.0	79.7	56.0	92.5	72.5	85.1	67.5	82.0	57.0	64.0	44.5	53.0	26.0	43.0	35.5
8	33.5	25.5	24.0	+ 6.0	43.0	27.0	59.0	39.0	67.3	49.0	75.0	52.5	88.5	67.0	83.0	67.6	84.0	57.0	68.5	40.0	55.7	26.0	43.7	37.0
9	35.0	+3.0	11.5	− 1.5	44.5	26.0	56.3	43.0	84.8	52.0	74.5	56.8	84.1	68.0	85.5	62.0	86.0	62.0	64.7	49.0	52.7	28.5	46.0	35.0
10	18.5	−2.0	22.0	− 2.5	51.0	30.5	64.0	45.0	74.0	63.0	81.0	53.2	93.0	71.5	86.5	64.4	84.5	52.0	71.7	49.2	53.0	38.8	41.0	29.0
11	33.5	+7.0	35.5	+16.5	55.3	27.5	63.0	49.0	76.5	49.0	86.1	60.0	93.0	71.5	84.8	68.0	69.0	46.0	50.7	45.0	53.7	36.0	40.0	28.0
12	32.5	17.0	34.0	15.0	68.0	39.0	53.0	38.5	78.8	58.0	72.5	65.0	72.5	63.0	83.3	68.9	72.0	49.5	56.5	45.0	65.5	29.8	45.0	29.0
13	33.0	25.0	39.0	21.5	53.5	34.0	49.5	33.5	70.5	49.0	72.5	52.5	94.0	61.0	82.2	67.3	79.5	60.0	56.5	32.5	66.5	31.2	45.5	27.0
14	39.0	27.0	44.5	16.0	52.5	34.0	59.0	32.5	75.5	45.0	76.3	53.0	90.5	67.5	82.5	65.0	80.5	60.0	56.0	30.8	63.5	46.5	45.5	25.5
15	28.5	12.5	26.5	8.5	69.5	41.0	65.0	38.5	77.1	49.0	78.3	55.5	93.0	68.0	81.5	67.0	83.0	57.0	68.5	48.0	56.5	39.0	34.0	19.0
16	38.5	15.0	26.5	7.0	60.0	37.5	58.5	30.0	67.5	41.5	78.1	60.0	93.0	70.0	85.5	69.5	70.5	61.0	53.5	40.0	55.0	35.0	47.0	24.0
17	28.8	17.0	48.5	9.0	42.1	21.8	40.0	23.5	69.0	38.0	81.0	57.0	87.0	70.8	87.0	68.5	76.0	50.0	59.0	35.0	27.0	26.0	38.0	14.0
18	28.5	21.5	26.0	7.2	42.5	21.0	36.5	24.0	65.1	40.0	75.5	54.0	97.0	70.5	85.5	67.5	58.5	45.5	62.5	38.0	44.5	22.0	37.5	11.0
19	28.5	16.0	28.5	17.5	43.5	27.2	52.0	22.0	74.5	42.3	81.5	54.0	80.8	62.6	84.0	65.0	62.0	44.6	58.5	35.0	63.5	37.0	36.1	15.0
20	29.5	10.0	33.7	26.0	43.5	29.8	54.0	35.2	83.7	48.3	82.5	63.0	73.0	65.2	82.5	64.0	71.9	46.3	62.0	32.0	52.0	40.0	40.0	13.5
21	34.0	18.5	47.3	20.0	35.0	25.0	52.0	30.0	84.5	54.0	84.0	55.5	87.5	66.3	82.5	60.5	66.1	41.8	76.8	37.0	47.3	37.0	54.5	13.6
22	52.0	30.5	53.5	23.0	36.5	19.5	54.5	28.0	88.0	52.0	84.8	62.5	87.8	66.6	80.5	64.0	64.1	45.2	77.5	45.0	47.0	27.0	65.3	39.0
23	42.0	23.0	55.5	34.3	42.5	19.0	61.0	33.0	91.0	61.0	92.2	68.5	89.9	71.4	68.5	61.0	65.7	43.5	74.0	45.0	46.1	32.0	70.7	39.2
24	33.2	23.0	55.5	46.0	49.0	29.0	61.0	35.0	83.0	64.5	95.5	70.0	85.1	67.0	65.0	60.5	68.5	39.2	78.5	46.0	50.0	30.8	49.5	38.7
25	39.0	24.5	57.0	34.0	44.1	27.0	62.8	34.5	83.5	66.0	98.2	71.0	84.0	64.0	77.5	59.0	72.5	44.5	80.0	45.0	45.0	25.0	56.0	39.0
26	32.3	17.5	53.0	27.0	59.5	27.0	66.5	36.9	88.5	64.0	96.2	72.3	95.5	68.5	79.5	55.5	68.0	44.0	79.2	48.5	45.5	31.0	45.5	40.0
27	38.5	15.0	50.5	27.0	64.5	47.5	52.7	47.1	82.1	56.5	98.2	72.0	91.5	69.0	78.5	56.0	74.1	42.2	63.5	39.0	49.8	30.4	53.0	30.5
28	41.5	32.0	31.7	18.0	60.5	32.0	49.5	40.0	82.5	49.5	94.9	72.2	78.5	66.0	71.7	62.0	79.5	45.5	65.0	33.5	50.0	29.9	37.5	30.0
29	37.5	31.2	. .	. .	55.0	35.0	64.9	35.0	87.3	53.5	95.1	69.9	81.0	65.5	71.3	64.3	77.5	52.5	70.0	43.5	49.9	20.6	42.0	35.0
30	41.5	27.0	. .	. .	62.0	39.4	73.0	49.0	82.5	51.0	88.5	69.0	84.1	66.5	85.3	63.7	78.3	54.5	67.0	44.0	28.3	10.0	46.5	39.0
31	45.0	28.0	. .	. .	67.5	48.0	. .	. .	83.0	49.5	. .	. .	77.0	69.0	88.8	64.4	. .	. .	48.5	36.0	. .	. .	53.0	39.0
Mean.	35.4	20.0	37.7	18.0	48.8	30.0	58.7	37.0	75.4	49.7	83.6	61.2	87.1	67.4	80.8	64.4	77.0	52.9	66.5	42.2	51.0	30.4	44.6	28.5
Mean temp.	27.7		27.8		39.4		47.8		62.5		72.4		77.2		72.6		65.0		54.4		40.7		36.6	

Mean temperature for the year from the maximum and minimum thermometers, 52°2.

MONTHLY MAXIMUM AND MINIMUM TEMPERATURES IN 1875.

Month.	Maximum.		Minimum.		Range.
	Day.	Temperature.	Day.	Temperature.	
		°		°	°
January	3	46.5	10	— 2.0	48.5
February	25	57.0	10	— 2.5	59.5
March	15	69.5	23	+19.0	50.5
April	2	73.5	19	22.0	51.5
May	23	91.0	3	37.0	54.0
June	25, 27	98.2	8, 13	52.5	45.7
July	18	97.0	13	61.0	36.0
August	31	88.8	26	55.5	33.3
September	3	93.0	24	39.2	53.8
October	25	80.0	14	30.8	49.2
November	13	66.5	30	10.0	56.5
December	23	70.7	18	11.0	59.7

Maximum temperature for the year	98°.2
Minimum temperature for the year	—2°.5
Range for the year	100°.7
Mean monthly range	49°.8

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force					Direction.	Force.					Direction.	Force.		
1875. Jan. 1	0	N. NE.	1	Haze		1875. Jan. 2	0	SE.	1	Sleet	10	1875. Jan. 3	0	NW.	2	Clear	0
	3	NE.	1	C. K.	6		3	SE.	1	K.	10		3	NW.	1	Haze	
	6	NE.	2	C. K.	8		6	SE.	1	N.	10		6	NW.	1	C. K. S.	4
	9	E.	1	C. K.	9		9	SE.	1	N.	10		9	W.	1	C. K. S.	6
	Noon	SE.	1	C. K.	10		Noon	SE.	1	K.	10		Noon	SE.	1	Haze	
	3	SE.	1	C. K.	10		3	W.	1	C. K.	9		3	S.	1	C. K.	4
	6	SE.	1	K.	10		6	W. NW.	5	Clear	0		6	SE.	1	C. K.	9
	9	SE.	1	Sleet	10		9	W. NW.	1	Clear	0		9	SE.	1	K.	10
Jan. 4	0	SE.	1	K.	10	Jan. 5	0	SW.	1	K.	10	Jan. 6	0	NE.	1	Clear	0
	3	NE.	1	Snow	10		3	SW.	1	K.	10		3	NE.	1	Clear	0
	6	S. SE.	1	K.	10		6	W.	1	K.	10		6	NE.	1	C. K.	2
	9	NE.	1	K.	10		9	N.	1	K.	10		9	N.	1	C. K. S.	6
	Noon	NW.	1	K.	10		Noon	N.	1	Snow	10		Noon	N. NE.	1	C. K.	9
	3	SE.	1	C. K. S.	4		3	NW.	1	C. K.	9		3	SE.	1	C. K.	10
	6	SW.	1	C. K.	2		6	NW.	2	C. K.	2		6	E.	1	K.	10
	9	W.	1	Clear	0		9	NW.	2	Clear	0		9	NE.	1	Snow	10
Jan. 7	0	N.	1	Sleet	10	Jan. 8	0	NW.	1	Haze		Jan. 9	0	SE.	1	K.	10
	3	NE.	1	N.	10		3	NW.	2	Clear	0		3	SE.	1	K.	10
	6	NE.	1	N.	10		6	NW.	3	C. S.	2		6	SW.	1	K.	10
	9	N.	1	N.	10		9	NW.	1	C. S.	3		9	NW.	1	K.	10
	Noon	NW.	1	N.	10		Noon	NW.	1	C. K.	7		Noon	S.	1	Snow	10
	3	NW.	1	N.	10		3	SW.	1	C. K.	9		3	NW.	5	C. K.	4
	6	NW.	2	N.	10		6	W.	1	C. K.	9		6	NW.	4	Clear	0
	9	NW.	1	K.	10		9	SW.	1	C. K.	9		9	NW.	4	Clear	0
Jan. 10	0	NW.	3	Clear	0	Jan. 11	0	N.	1	C. K.	2	Jan. 12	0	NW.	1	K.	10
	3	NW.	2	Clear	0		3	NW.	1	Clear	0		3	NW.	1	K.	10
	6	NW.	2	Clear	0		6	NW.	1	Clear	0		6	NE.	1	K.	10
	9	NW.	1	Clear	0		9	SE.	1	Haze			9	NE.	2	K.	10
	Noon	NW.	1	C.	3		Noon	S.	1	C. K.	2		Noon	NE.	1	C. K.	10
	3	W.	1	C. K.	4		3	SE.	1	C.	1		3	NE.	1	K.	10
	6	N.	1	C. S.	3		6	SW.	1	S.	1		6	NE.	1	N.	10
	9	N.	1	Clear	0		9	NW.	1	Clear	0		9	NE.	1	N.	10
Jan. 13	0	NE.	1	Sleet	10	Jan. 14	0	S.	1	C. K.	3	Jan. 15	0	NW.	1	Clear	0
	3	NE.	1	K.	10		3	W.	3	Clear	0		3	NW.	4	Clear	0
	6	NW.	1	K.	10		6	W.	2	Clear	0		6	NW.	2	C. K. S.	2
	9	NW.	1	K.	10		9	NW.	1	Clear	0		9	NW.	2	C. K.	5
	Noon	NW.	1	K.	10		Noon	NW.	2	C. K.	1		Noon	NW.	2	C. K.	1
	3	SE.	1	K.	10		3	NW.	1	Clear	0		3	NW.	2	C. K.	6
	6	S.	1	K.	10		6	W.	1	S.	1		6	NW.	1	C. S.	3
	9	S.	1	Fog	10		9	NW.	1	Clear	0		9	NW.	1	C. K.	7

REMARKS.

January 1. Began to snow at 2h p. m.
2. Amount of melted snow and rain, 0.420 inch.
6. Snow at 9h p. m., followed by sleet and rain ; amount of melted snow and rain, 0.720 inch.
9. Light snow at noon.
12. Rain and sleet at 6h p. m.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Jan. 16	0	E.	1	C. K.	10	1875. Jan. 17	0	NW.	1	C. K.	8	1875. Jan. 18	0	NE.	1	C. K.	9
	3	NE.	1	Clear	0		3	NW.	1	C. S.	6		3	E.	1	C. K.	10
	6	S.	1	C. K.	10		6	NW.	1	S.	2		6	SE.	1	K.	10
	9	S.	1	K.	10		9	W. NW.	1	C. K.	3		9	SE.	2	K.	10
	Noon	S.	1	C. K.	10		Noon	NW.	2	C. K.	9		Noon	NW.	1	K.	10
	3	N. NW.	1	C. K.	10		3	NW.	2	C. K.	10		3	NW.	1	C. K.	9
	6	NW.	1	C. K.	2		6	NW.	1	K.	10		6	N. NW.	1	C. K. S.	7
	9	NW.	2	C. K.	7		9	NW.	1	K.	10		9	N. NE.	1	K.	10
Jan. 19	0	NW.	1	Snow	10	Jan. 20	0	NW.	1	Clear	0	Jan. 21	0	SE.	1	C. K.	10
	3	NW.	2	C. K.	9		3	NW.	1	Clear	0		3	SE.	1	K.	10
	6	NW.	2	C. S.	4		6	NW.	1	Clear	0		6	SE.	1	C. S.	4
	9	NW.	2	C. K.	8		9	NW.	1	Haze			9	SE.	1	C. K.	9
	Noon	NW.	2	C. K. S.	7		Noon	NW.	1	C. K.	3		Noon	S.	1	K.	10
	3	W.	2	C. K.	10		3	W.	1	C. K.	3		3	SE.	1	C. K.	9
	6	N.	1	C. K.	10		6	N. NW.	1	C. K.	10		6	S.	1	K.	10
	9	N.	1	C. K.	10		9	SE.	1	K.	10		9	SE.	1	C. K.	10
Jan. 22	0	E.	1	K.	10	Jan. 23	0	NW.	1	Clear	0	Jan. 24	0	E.	1	C. K.	3
	3	SW.	1	K.	10		3	NW.	1	Clear	0		3	E.	1	C. K.	10
	6	SE.	1	K.	10		6	NW.	1	Clear	0		6	E.	1	N.	10
	9	W.	1	C. K.	10		9	NE.	1	Clear	0		9	NE.	1	N.	10
	Noon	W.	2	C. K.	6		Noon	N.	1	Clear	0		Noon	NE.	1	N.	10
	3	W.	3	C. K.	3		3	N. NW.	1	C.	2		3	NE.	1	N.	10
	6	NW.	1	C. S.	1		6	NW.	1	C. S.	1		6	SW.	1	C. K.	10
	9	NW.	1	Clear	0		9	NE.	1	C. K.	7		9	SW.	1	K.	10
Jan. 25	0	W.	1	Fog.		Jan. 26	0	NW.	2	C. K.	10	Jan. 27	0	NW.	1	C.	3
	3	W.	1	Clear	0		3	N.	1	C. K.	9		3	NW.	1	Clear	0
	6	W.	1	Clear	0		6	NW.	2	C. K.	9		6	N.	1	C. K.	4
	9	W.	2	Clear	0		9	N. NW.	1	C. K.	10		9	E.	1	C. K.	9
	Noon	W.	1	Clear	0		Noon	NW.	2	C. K.	6		Noon	SE.	1	C. K.	10
	3	W.	1	C. K.	1		3	W.	1	S.	2		3	S. SE.	1	K.	10
	6	W.	1	Clear	0		6	W.	1	C.	1		6	E.	1	K.	10
	9	W.	1	Clear	0		9	W.	1	Clear	0		9	NE.	1	Snow	10
Jan. 28	0	NE.	1	K.	10	Jan. 29	0	NW.	1	K.	10	Jan. 30	0	E.	1	K.	10
	3	NE.	1	K.	10		3	NE.	1	N.	10		3	NW.	1	K.	10
	6	E.	1	K.	10		6	N. NW.	1	K.	10		6	W. SW.	1	C. K.	3
	9	NE.	1	K.	10		9	N.	1	Mist	10		9	E.	1	K.	10
	Noon	E.	1	K.	10		Noon	NE.	1	N.	10		Noon	NW.	1	C. K.	7
	3	NW.	1	N.	10		3	NE.	1	N.	10		3	NW.	1	C. K.	10
	6	S. SE.	1	K.	10		6	E.	1	N.	10		6	N.	1	C. K. S.	10
	9	SE.	1	C. K.	9		9	E.	1	Mist	10		9	NE.	1	K.	10

REMARKS.

January 22. Light rain at 9^h 30^m a. m.
24. Began to rain at 6^h a. m.; amount, 0.800 inch.
27. Light hail, sleet, and snow at 6^h 5^m p. m.
29. Rain at 3^h a. m.; amount, 0.390 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875.						1875.						1875.					
Jan. 31	0	E.	1	K.	10												
	3	E.	1	K.	10												
	6	NE.	1	Snow	10												
	9	N. NE.	1	Mist	10												
	Noon	N. NE.	1	Mist	10												
	3	N. NW.	1	Snow	10												
	6	NW.	1	C. K. S.	6												
	9	NW.	1	K.	10												
Feb. 1	0	NW.	3	Clear	0	Feb. 2	0	S.	1	Clear	0	Feb. 3	0	SE.	1	C. K.	4
	3	NW.	3	Clear	0		3	S.	1	Clear	0		3	E.	1	K.	10
	6	NW.	3	Clear	0		6	E.	1	C. K. S.	2		6	E.	1	N.	10
	9	NW.	3	Clear	0		9	SE.	1	Haze			9	S. SE.	1	N.	10
	Noon	NW.	2	C. K.	1		Noon	SE.	1	C. K.	4		Noon	S.	2	N.	10
	3	W. SW.	1	Clear	0		3	SE.	1	C. K. S.	5		3	S.	2	C. K.	10
	6	S.	1	Clear	0		6	SE.	1	C. K.	10		6	S.	1	C. K. S.	8
	9	S.	1	Clear	0		9	SE.	1	C. K.	8		9	W.	3	C. S.	3
Feb. 4	0	W.	3	C. K.	3	Feb. 5	0	W. NW.	3	Clear	0	Feb. 6	0	SE.	1	Clear	0
	3	W.	3	C. K.	3		3	W. NW.	3	Clear	0		3	SE.	1	Clear	0
	6	W.	3	C. K.	9		6	W.	2	Clear	0		6	S.	1	C. K.	10
	9	W. NW.	2	C. K.	9		9	NW.	3	Clear	0		9	S.	1	C. K.	8
	Noon	SW.	4	C. K.	7		Noon	NW.	2	C. K.	2		Noon	NW.	1	C. K.	6
	3	W. SW.	3	C. K.	4		3	NW.	1	C. K.	2		3	NW.	2	C. K.	8
	6	W. NW.	3	S.	2		6	SE.	1	Clear	0		6	N. NW.	2	C. K.	10
	9	W. NW.	3	Clear	0		9	SE.	1	Clear	0		9	NW.	2	C. K.	10
Feb. 7	0	N. NW.	3	K.	10	Feb. 8	0	NW.	2	Snow	10	Feb. 9	0	NW.	1	Clear	0
	3	N. NE.	2	K.	10		3	NW.	1	K.	10		3	NW.	1	Clear	0
	6	N. NE.	2	Snow	10		6	NW.	1	K.	10		6	NW.	1	S.	1
	9	NE.	2	Snow	10		9	W. NW.	1	C. K. S.	3		9	NW.	3	C. K.	9
	Noon	NE.	2	Snow	10		Noon	W.	2	C. K.	2		Noon	NW.	3	C. K.	3
	3	N.	2	Snow	10		3	W.	2	C. K.	9		3	NW.	3	C. K.	2
	6	N.	2	Snow	10		6	NW	1	C. K.	10		6	NW.	2	Clear	0
	9	N. NE.	2	Snow	10		9	NW	2	C. K.	2		9	NW.	1	Clear	0
Feb. 10	0	NW.	2	Clear	0	Feb. 11	0	SE.	1	Snow	10	Feb. 12	0	NW.	3	Clear	0
	3	NW.	1	Clear	0		3	SW.	1	Snow	10		3	NW.	2	Clear	0
	6	N.	1	Clear	0		6	NE.	1	Snow	10		6	NW.	1	Clear	0
	9	W.	1	C. K.	4		9	W.	1	Sleet	10		9	S.	1	C.	1
	Noon	S.	1	C. K.	3		Noon	S.	1	N.	10		Noon	E.	1	C. K.	4
	3	S.	1	C. K.	7		3	W.	1	C. K.	9		3	W. NW.	1	C. K.	10
	6	SE.	2	Haze			6	W.	1	Clear	0		6	NE.	1	C. K. S.	7
	9	S. SE.	2	Haze			9	NW.	2	Clear	0		9	NE.	2	C. K.	9

REMARKS.

February 3. Began to rain at 5^h 25^m a. m.; amount, 0.424 inch.
7. Began to snow at 3^h 20^m a. m.; depth, 3.0 inches; melted snow, 0.404 inch.
10. Began to snow at 11^h 35^m p. m.; soon turned to rain; amount of melted snow and rain, 0.850 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Feb. 13	0	NE.	1	C. K. S.	4	1875. Feb. 14	0	N. NW.	1	C. K.	4	1875. Feb. 15	0	NW.	2	Clear	0
	3	NE.	1	K.	10		3	NW.	1	C. K.	10		3	NW.	2	Clear	0
	6	NE.	1	K.	10		6	NW.	1	K.	10		6	NW.	3	Clear	0
	9	NW.	1	C. K.	5		9	NE.	1	C. K.	9		9	N. NW.	3	Clear	0
	Noon	E.	1	C. K. S.	2		Noon	S.	1	C.	1		Noon	NW.	2	Clear	0
	3	NE.	1	Haze			3	W.	1	C.	1		3	NW.	3	C.	1
	6	NE.	1	C. S.	2		6	N. NW.	3	C. K.	3		6	NW.	3	Clear	0
	9	E.	1	C. K.	4		9	NW.	3	C.	1		9	NW.	2	C. K.	2
Feb. 16	0	N. NW.	2	C.	1	Feb. 17	0	S.	1	Clear	0	Feb. 18	0	NW.	4	C. K.	8
	3	NW.	2	C. K.	2		3	S.	1	C. K.	3		3	NW.	3	C. K.	3
	6	NW.	1	C. K.	10		6	S. SE.	1	C. K.	2		6	N. NW.	2	Clear	0
	9	NW.	3	C. S.	3		9	S.	2	C. K.	9		9	NW.	2	Clear	0
	Noon	W.	2	C. K.	9		Noon	S.	2	C. K. S.	7		Noon	N.	1	C. S.	3
	3	W.	1	S.	1		3	NW.	1	S.	1		3	S. SW.	1	C. S.	2
	6	W.	1	Clear	0		6	NW.	2	C. K.	2		6	SE.	1	C. K.	7
	9	W.	1	Clear	0		9	NW.	3	C. K.	2		9	E. SE.	1	Clear	0
Feb. 19	0	SE.	1	C. K.	10	Feb. 20	0	E. SE.	1	K.	10	Feb. 21	0	W.	1	C. K.	9
	3	SE.	1	C. K.	10		3	SE.	1	N.	10		3	SW.	1	C. K.	8
	6	E. SE.	1	K.	10		6	SE.	1	N.	10		6	W.	1	C. K.	2
	9	SE.	1	Snow	10		9	E. NE.	1	N.	10		9	W. NW.	1	C. K.	7
	Noon	SE.	1	Snow	10		Noon	W.	1	N.	10		Noon	S.	1	C. K.	10
	3	S.	1	Snow	10		3	NW.	1	Snow	10		3	S. SW.	1	C. K.	8
	6	S.	1	C. K.	10		6	NW.	1	C. K. S.	10		6	SE.	1	C. K.	7
	9	E.	1	K.	10		9	W. NW.	1	C. S.	6		9	N.	1	C. K.	6
Feb. 22	0	NE.	1	C. K.	9	Feb. 23	0	S.	1	Clear	0	Feb. 24	0	SE.	1	Fog	
	3	NE.	1	C. K.	9		3	S.	1	Clear	0		3	SE.	1	N.	10
	6	N.	1	Clear	0		6	SE.	1	C. K.	4		6	SE.	1	N.	10
	9	S. SE.	1	Haze			9	S. SE.	1	C. K.	10		9	SE.	1	Fog	
	Noon	S. SE.	1	Haze			Noon	S. SE.	1	C. K.	10		Noon	S.	2	C. K.	10
	3	S. SE.	1	Clear	0		3	S. SE.	1	K.	10		3	S.	1	Fog	10
	6	S.	1	S.	1		6	SE.	1	N.	10		6	S.	1	C. K. S.	8
	9	S.	1	Clear	0		9	SE.	1	K.	10		9	S.	1	Fog	
Feb. 25	0	S.	2	Fog		Feb. 26	0	NW.	3	C. K.	2	Feb. 27	0	SE.	1	C. K.	9
	3	S.	2	N.	10		3	W.	2	Clear	0		3	SE.	1	C. K.	9
	6	SE.	2	Fog			6	SW.	2	Clear	0		6	S.	1	C. K.	8
	9	S.	1	N.	10		9	SW.	1	Clear	0		9	S.	1	C. K.	8
	Noon	S. by E.	1	C. K.	10		Noon	SW.	2	Clear	0		Noon	NW.	2	C. K.	10
	3	S.	1	N.	10		3	SW.	3	Clear	0		3	NW.	4	C. K.	3
	6	NW.	5	N.	10		6	S.	1	C. S.	3		6	NW.	4	C. K.	2
	9	NW.	5	C. K.	4		9	SE.	1	C.	2		9	NW.	4	Clear	0

REMARKS.

February 20. Rain and sleet at 3^h a. m.; amount, 0.562 inch. The sun thermometer covered with ice at 6^h.
23. Began to rain at 5^h 40^m p. m.
24. Light rain at 0^h 20^m a. m.
25. Began to rain at 0^h 20^m a. m; amount, 0.660 inch.
27. A fine display of zodiacal light; the apex of the light reaching quite to the Pleiades.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875.						1875.						1875.					
Feb. 28	0	NW.	3	C.	1												
	3	NW.	2	C. K.	6												
	6	N. NW.	2	C. K.	3												
	9	NW.	3	C. K.	2												
	Noon	NW.	3	Clear	0												
	3	NW.	2	C. K.	2												
	6	N.	1	C. K. S.	3												
	9	NE.	2	Haze													
Mar. 1	0	E.	2	C. K.	4	Mar. 2	0	NW.	1	K.	10	Mar. 3	0	NE.	1	K.	10
	3	E.	2	C. K.	6		3	NW.	1	K.	10		3	NE.	1	N.	10
	6	E.	2	Snow	10		6	NW.	1	K.	10		6	NE.	1	Sleet	10
	9	E.	2	Snow	10		9	W.	1	C. K.	9		9	NE.	2	Sleet	10
	Noon	N.	2	N.	10		Noon	N.	1	C. K.	7		Noon	E.	2	Sleet	10
	3	N.	1	N.	10		3	NW.	2	C. K.	9		3	N.	2	N.	10
	6	SE.	1	K.	10		6	N.	1	C. K. S.	8		6	NW.	1	N.	10
	9	SE.	1	N.	10		9	NE.	1	K.	10		9	NW.	3	K.	10
Mar. 4	0	NW.	2	K.	10	Mar. 5	0	E.	1	C. K.	9	Mar. 6	0	N.	1	Mist	10
	3	NW.	3	C. K.	4		3	E.	1	C. K.	6		3	NW.	1	Mist	10
	6	NW.	3	C. K.	9		6	SE.	1	C. K.	8		6	NW.	1	Mist	10
	9	NW.	3	Clear	0		9	E.	2	Snow	10		9	W.	1	K.	10
	Noon	NW.	2	C. K.	3		Noon	NE.	1	Snow	10		Noon	W.	1	C. K.	10
	3	N. NW.	1	C. K.	4		3	E.	1	Sleet	10		3	SE.	1	C. K.	10
	6	N.	1	Clear	0		6	N.	1	N.	10		6	S. SE.	1	K.	10
	9	NW.	1	Clear	0		9	N.	1	Mist	10		9	SE.	1	Fog	
Mar. 7	0	S.	1	Fog		Mar. 8	0	NW.	3	Snow	10	Mar. 9	0	SW.	1	Haze	
	3	NW.	1	Fog			3	NW.	3	K.	10		3	NW.	1	Haze	
	6	N. NE.	1	Fog			6	NW.	2	C. K.	10		6	N.	1	K.	10
	9	NE.	1	Snow	10		9	W. NW.	2	C.	1		9	N.	1	K.	10
	Noon	NE.	2	N.	10		Noon	W. NW.	2	C. K.	6		Noon	E.	1	K.	10
	3	NE.	3	N.	10		3	W. NW.	2	C. S.	2		3	S.	1	C. K.	10
	6	NE.	3	N.	10		6	N.	1	C. K.	2		6	E.	1	C. K.	9
	9	NE.	3	N.	10		9	W.	1	Clear	0		9	SE.	1	C. K.	3
Mar. 10	0	SE.	1	C. K. S.	2	Mar. 11	0	NE.	1	C. K. S.	1	Mar. 12	0	SE.	2	Haze	
	3	NE.	1	K.	10		3	N.	1	Clear	0		3	S.	1	C. K.	3
	6	NW.	1	Fog	10		6	S.	1	C. K.	6		6	S.	1	Haze	
	9	S.	1	Clear	0		9	SE.	1	Clear	0		9	S. SW.	1	Haze	
	Noon	W.	2	K.	1		Noon	S.	1	C. S.	2		Noon	SW.	1	C. K. S.	3
	3	NW.	2	C.	1		3	S. SE	2	C. K.	4		3	S. SE.	1	C. K.	4
	6	NW.	2	C. K. S.	3		6	SE.	2	C. K.	9		6	NE.	2	C. K.	9
	9	SE.	1	C. K.	3		9	SE.	2	C. K.	9		9	NE.	1	Haze	

REMARKS.

March 1. Began to snow at 4^{h} 45^{m} a. m.; depth, 4.0 inches ; amount of melted snow, 0.566 inch. Began to rain at noon ; amount, 0.188 inch.
2. Lightning at 8^{h} p. m.
3. Rain at 0^{h} 15^{m} a. m ; amount, 0.640 inch.
5. Snow at 9^{h} a. m., followed by sleet and rain ; depth of snow, 2.0 inches ; amount of melted snow and rain, 0.478 inch.
7. Snow at 7^{h} a. m., followed by rain ; melted snow and rain, 1.270 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Mar. 13	0	NW.	1	Haze		1875. Mar. 14	0	E.	2	C. K.	10	1875. Mar. 15	0	E.	1	C. K.	9
	3	NE.	2	K.	10		3	SE.	2	K.	10		3	E.	1	C. K.	10
	6	N.	2	N.	10		6	SE.	1	Mist	10		6	E.	1	C. K.	10
	9	N.	1	K.	10		9	S. SE.	1	Fog			9	N.	1	N.	10
	Noon	N.	1	K.	10		Noon	S.	1	C. K.	10		Noon	E.	1	Mist	10
	3	SE.	1	Haze			3	S.	1	C. K.	10		3	SE.	1	C. K.	9
	6	N.	1	C. K.	3		6	E.	1	C. K.	10		6	S.	1	C. K. S.	6
	9	NE.	1	Haze			9	E.	1	C. K.	10		9	S.	2	C. K.	10
Mar. 16	0	S.	1	C. K.	10	Mar. 17	0	W.	1	C.	1	Mar. 18	0	NW.	2	Clear	0
	3	W.	2	C. K.	10		3	W.	1	C.	2		3	NW.	2	C.	1
	6	NW.	2	C. K.	10		6	W.	1	C. K.	3		6	NW.	2	Clear	0
	9	NW.	2	C. K. S.	9		9	NW.	3	C. K.	4		9	NW.	1	Clear	0
	Noon	NW.	1	C. K.	2		Noon	W. NW.	4	C. K.	3		Noon	NW.	3	Clear	0
	3	SE.	1	C. K.	7		3	NW.	3	C. K.	1		3	NW.	2	C. K.	4
	6	E.	2	C.	2		6	NW.	4	C. S.	2		6	N. NW.	1	S.	2
	9	NW.	1	C. K.	8		9	NW.	2	Clear	0		9	N.	1	C. K.	8
Mar. 19	0	S.	1	C. K.	10	Mar. 20	0	E.	2	N.	10	Mar. 21	0	NE.	1	K.	10
	3	S.	1	C. K.	10		3	E.	1	N.	10		3	NE.	1	K.	10
	6	E.	1	C. K.	10		6	N. NE.	1	N.	10		6	N.	1	K.	10
	9	E.	1	C. K.	10		9	N.	1	N.	10		9	N.	1	K.	10
	Noon	E. NE.	1	C. K.	10		Noon	NE.	1	K.	10		Noon	NW.	2	K.	10
	3	N. NE.	1	C. K.	10		3	N. NE.	1	Haze			3	NW.	2	K.	10
	6	NE.	1	C. K.	6		6	NE.	1	N.	10		6	NW.	1	C. K.	3
	9	NE.	2	K.	10		9	N.	2	K.	10		9	N.	1	C.	1
Mar. 22	0	NW.	3	Clear	0	Mar. 23	0	NW.	3	Clear	0	Mar. 24	0	SE.	1	K.	10
	3	NW.	1	C. K.	4		3	NW.	1	Clear	0		3	S.	2	Snow	10
	6	NW.	1	S.	1		6	W. NW.	1	Clear	0		6	S. SE.	2	K.	10
	9	NW.	2	C.	1		9	NW.	2	Clear	0		9	SE.	1	Snow	10
	Noon	NW.	2	C.	2		Noon	NW.	2	C.	3		Noon	SE.	1	K.	10
	3	NW.	2	C. K.	2		3	E.	1	C.	2		3	SE.	1	K.	10
	6	N. NW.	3	Clear	0		6	E. SE.	1	Haze			6	NW.	1	C. K. S.	9
	9	NW.	3	Clear	0		9	E. SE.	1	Haze			9	NW.	1	S.	1
Mar. 25	0	NW.	2	C. K.	6	Mar. 26	0	NW.	1	C. K. S.	6	Mar. 27	0	S.	2	C. K.	10
	3	NW.	2	C. K.	7		3	SE.	1	C. K.	10		3	N.	2	N.	10
	6	NW.	2	C. K.	2		6	SE.	1	C. K. S.	6		6	N.	2	K.	10
	9	NW.	3	C. K.	9		9	S.	2	C. K.	9		9	NW.	2	C. K.	9
	Noon	NW.	3	C. K.	3		Noon	SE.	1	N.	10		Noon	NW.	2	C. K.	2
	3	NW.	3	C. K.	1		3	SW.	3	C. K.	10		3	W. NW.	3	C. K.	7
	6	NW.	2	C. K. S.	2		6	SW.	2	C. K. S.	10		6	W.	1	C. K. S.	8
	9	NW.	1	Haze			9	SW.	1	K.	10		9	SW.	1	C. K.	2

REMARKS.

March 13. Light rain at 2^h 20^m a. m ; lightning and thunder at 4^h 45^m a. m.
20. Raining at 0^h a. m.; amount, 0.828 inch.
24. Began to snow at 2^h 20^m a. m.; amount of melted snow, 0.158 inch.
27. A light shower of rain at 3^h a. m.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Mar. 28	0	NW.	1	Haze		1875. Mar. 29	0	S.	1	K.	10	1875. Mar. 30	0	E.	1	C. K.	10
	3	W.	1	C. K.	4		3	SE.	1	K.	10		3	N. NE.	1	C. K.	10
	6	NE.	1	S.	1		6	SE.	1	Snow	10		6	N. NE.	1	C. K. S.	9
	9	NE.	1	Clear	0		9	E.	1	N.	10		9	E.	1	C. K.	9
	Noon	NE.	1	C. K.	6		Noon	NE.	1	C. K.	10		Noon	S.	1	C. K.	8
	3	S.	1	C. K.	4		3	SE.	1	C. K.	8		3	S.	1	C. K.	10
	6	E.	1	C. K.	10		6	E. SE.	1	C. K.	10		6	SE.	1	C. K.	9
	9	E.	1	C. K.	10		9	SE.	1	K.	10		9	SE.	1	K.	10
Mar. 31	0	SE.	1	C. K.	10												
	3	S. SE.	1	C. K.	10												
	6	SE.	1	K.	10												
	9	S.	1	C. K.	8												
	Noon	SE.	1	C. K.	10												
	3	SE.	1	C. K.	6												
	6	E.	2	C. K.	4												
	9	S.	2	K.	10												
Apr. 1	0	SE.	2	C. K.	10	Apr. 2	0	S.	1	Haze		Apr. 3	0	NW.	4	N.	10
	3	SE.	1	C.	2		3	S.	1	Haze			3	NW.	3	N.	10
	6	NE.	1	C. K. S.	4		6	S.	1	C. K. S.	9		6	NW.	2	N.	10
	9	SW.	2	C. K.	6		9	S.	2	C. K.	10		9	N. NW.	1	C. K.	9
	Noon	S. SW.	3	C. K.	5		Noon	S.	2	C. K.	9		Noon	N. NW.	2	C. K.	8
	3	S.	3	C. K.	4		3	S.	2	N.	10		3	N.	1	K.	10
	6	S.	2	C. K.	9		6	E.	2	N.	10		6	N.	1	C. K.	10
	9	S.	1	C. K.	9		9	SE.	2	K.	10		9	NE.	1	K.	10
Apr. 4	0	NE.	1	K.	10	Apr. 5	0	W.	1	Clear	0	Apr. 6	0	W.	1	Clear	0
	3	E.	1	K.	10		3	W.	1	Clear	0		3	E.	1	Clear	0
	6	N. NW.	1	C. K.	8		6	NW.	2	Clear	0		6	NW.	1	Clear	0
	9	N. NW.	1	C. K.	1		9	NW.	3	C.	1		9	S. by W.	1	Clear	0
	Noon	N. NW.	1	Clear	0		Noon	N.	3	Clear	0		Noon	SE.	1	C. K.	1
	3	NW.	1	Clear	0		3	N.	2	C. K.	1		3	SE.	1	Clear	0
	6	W.	1	C. K.	2		6	N.	2	Clear	0		6	S.	1	C. K. S.	4
	9	W.	1	Clear	0		9	NW.	2	Clear	0		9	S.	1	Haze	
Apr. 7	0	S.	2	C. K.	8	Apr. 8	0	E.	2	C. K.	3	Apr. 9	0	S.	1	C. K.	10
	3	S.	1	C. K.	9		3	SE.	1	K.	10		3	S.	1	C. K.	6
	6	E.	1	C. K.	9		6	S.	1	K.	10		6	E.	1	Fog	
	9	N. NE.	2	C. K.	9		9	S.	1	K.	10		9	E. NE.	1	C. K.	10
	Noon	NE.	3	C. K.	4		Noon	S.	1	C. K.	10		Noon	NE.	2	C. K.	10
	3	NE.	2	C. K.	4		3	S. SE.	2	Haze			3	NE.	2	K.	10
	6	E.	3	C. K.	7		6	S.	1	S.	1		6	NE.	1	K.	10
	9	E.	2	C.	3		9	S.	1	C.	3		9	NE.	1	K.	10

REMARKS.

April 2. Began to rain at 3^h p. m; amount, 0.680 inch.

9. Lightning in the northwest at 11^h 45^m p. m.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Apr. 10	0	S.	1	K.	10	1875. Apr. 11	0	SE.	1	C. K.	6	1875. Apr. 12	0	S.	1	N.	10
	3	E.	1	K.	10		3	E.	1	C. K.	10		3	E.	1	Mist	10
	6	N. NE.	1	Haze			6	E.	1	K.	10		6	NE.	1	Mist	10
	9	S.	1	C. K.	9		9	SE.	1	K.	10		9	E.	2	Mist	10
	Noon	NE.	1	C. K.	10		Noon	SE.	1	C. K.	10		Noon	E.	1	K.	10
	3	NW.	1	C. K.	10		3	SE.	1	K.	10		3	E.	2	N.	10
	6	SW.	1	C. K.	10		6	S.	1	C. K.	10		6	E.	2	Mist	10
	9	S.	1	C. K.	10		9	S.	1	C. K.	10		9	E.	2	N.	10
Apr. 13	0	NE.	2	N.	10	Apr. 14	0	N. NW.	1	K.	10	Apr. 15	0	NE.	1	C. K.	8
	3	N.	2	N.	10		3	NW.	2	C. K.	4		3	NE.	1	C. K.	10
	6	N. NW.	1	Snow	10		6	NW.	2	S.	2		6	NW.	1	C. K.	4
	9	N.	2	N.	10		9	NW.	3	C. K.	3		9	S.	1	C. K.	2
	Noon	NW.	2	K.	10		Noon	NW.	3	C. K.	4		Noon	SE.	1	C. K.	6
	3	NW.	1	C. K.	9		3	NW.	2	C. K.	4		3	S. SE.	2	C. K.	6
	6	NE.	1	C. K. S.	9		6	N.	1	C. K.	2		6	S.	2	C. K.	10
	9	N.	1	Mist	10		9	N.	1	C. K.	3		9	S.	2	C. K.	10
Apr. 16	0	S.	1	N.	10	Apr. 17	0	N. NW.	1	C. S.	2	Apr. 18	0	W. SW.	1	C. K.	10
	3	W.	2	C. K.	8		3	NW.	1	Clear	0		3	W.	1	C. K.	10
	6	NW.	3	C. K.	9		6	W.	1	C.	1		6	W.	2	C. K. S.	6
	9	NE.	1	C. K.	10		9	NW.	2	C. K.	3		9	NW.	3	C. K.	7
	Noon	NW.	2	C. K.	4		Noon	W.	2	C. K.	9		Noon	NW.	3	C. K.	8
	3	NW.	3	C. K.	10		3	W.	2	C. K.	8		3	NW.	3	C. K.	9
	6	NW.	3	C. K.	10		6	W.	1	C. K.	10		6	NW.	3	C. K.	7
	9	NW.	3	C. K.	4		9	N. NW.	1	C. K.	10		9	NW.	3	C. K.	3
Apr. 19	0	NW.	3	C. K.	1	Apr. 20	0	E. SE.	1	C. K.	2	Apr. 21	0	NW.	3	C. K.	3
	3	NW.	2	C. K. S.	5		3	SE.	1	C. K.	8		3	NW.	3	C. K.	7
	6	SW.	1	C. K. S.	3		6	N. NE.	1	N.	10		6	NW.	2	Haze	
	9	SW.	2	C. K.	10		9	N.	1	C. K.	10		9	NW.	2	C. S.	4
	Noon	W. NW.	3	C. K.	3		Noon	NW.	3	C. K.	4		Noon	N.	2	S.	2
	3	W. NW.	3	C. K. S.	9		3	NW.	3	C. S.	2		3	N. NW.	2	Clear	0
	6	NW.	1	C. K.	10		6	NW.	3	C. K.	2		6	NW.	2	Clear	0
	9	E.	2	C. K.	10		9	NW.	2	Clear	0		9	N. NW.	2	Clear	0
Apr. 22	0	NW.	2	Clear	0	Apr. 23	0	NW.	3	C.	6	Apr 24	0	NW.	1	C. K. S.	7
	3	NW.	1	Clear	0		3	NW.	2	C.	3		3	W.	1	C.	1
	6	NW.	2	Clear	0		6	N. NW.	2	C.	2		6	NW.	1	C. K.	4
	9	N.	2	Clear	0		9	W.	1	Clear	0		9	SE.	1	Haze	
	Noon	NW.	2	Clear	0		Noon	W.	1	Clear	0		Noon	W.	2	K.	10
	3	N. NW.	2	Clear	0		3	W. NW.	1	Clear	0		3	NW.	2	N.	9
	6	NW.	2	C. K.	3		6	N. NW.	1	C. K.	2		6	N. NW.	4	C. K.	4
	9	W.	1	Clear	0		9	NW.	1	C. K.	2		9	NW.	3	C. K.	6

REMARKS.

April 12. Began to rain at 3^h p. m.; amount, 0.718 inch.
15. At 7^h 20^m p. m., a lunar halo, with a diameter of 30°.
16. Light snow at 6^h p. m.
21. A lunar halo at midnight.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Apr. 25	0	NW.	3	C. K.	9	1875. Apr. 26	0	SE.	1	C. K.	1	1875. Apr. 27	0	N.	1	K.	10
	3	NW.	3	C. K.	2		3	S.	1	C. K.	9		3	NE.	1	K.	10
	6	NW.	2	Clear	0		6	NW.	1	C. K.	4		6	NE.	1	K.	10
	9	N. NW.	3	C. K.	3		9	SE.	1	C. K.	9		9	NE.	1	K.	10
	Noon	NW.	2	C. K.	1		Noon	SE.	1	C. K.	9		Noon	NE.	2	N.	10
	3	NW.	2	C. K.	1		3	S.	1	C. K.	10		3	NE.	2	N.	10
	6	N. NW.	2	C.	1		6	S.	1	C. K.	10		6	NE.	1	N.	10
	9	NW.	1	Clear	0		9	SW.	1	K.	10		9	NE.	1	N.	10
Apr. 28	0	SE.	2	N.	10	Apr. 29	0	NW.	1	Clear	0	Apr. 30	0	S.	1	K.	10
	3	E.	2	N.	10		3	NW.	1	Fog			3	NW.	2	Clear	0
	6	NE.	3	K.	10		6	NW.	1	Fog			6	NW.	2	Clear	0
	9	N.	1	N.	10		9	S. SE.	1	Clear	0		9	NW.	2	Clear	0
	Noon	N.	2	K.	10		Noon	S.	2	C. K.	9		Noon	NW.	2	C. K.	1
	3	N.	2	N.	10		3	S.	2	C. K.	10		3	NW.	3	C. K.	2
	6	N. NE.	2	K.	10		6	S. SE.	2	C.	4		6	W.	3	C. K. S.	7
	9	NW.	1	Clear	0		9	S.	2	Clear	0		9	S.	1	Haze	
May 1	0	S.	1	C. K.	4	May 2	0	NW.	1	Clear	0	May 3	0	NW.	2	Clear	0
	3	S.	1	C. K.	3		3	SW.	1	Clear	0		3	SW.	1	C. K.	6
	6	E.	1	C. K.	10		6	SW.	1	C. S.	4		6	NW.	2	C. S.	6
	9	NE.	1	C. K.	10		9	NW.	4	C. K.	3		9	NW.	2	C. K.	3
	Noon	E. NE.	2	C. K.	10		Noon	W. NW.	4	C. K.	6		Noon	W.	2	C. K.	2
	3	E. SE.	3	C. K.	8		3	W. NW.	3	C. K.	4		3	S.	1	C. K.	3
	6	E.	3	C. K.	10		6	NW.	3	Clear	0		6	S. SE.	1	C. K.	10
	9	SE.	1	K.	10		9	NW.	3	Clear	0		9	SE.	1	C. K.	7
May 4	0	S.	1	C. K.	8	May 5	0	W.	2	Clear	0	May 6	0	S.	2	K.	10
	3	E.	1	N.	10		3	NW.	1	Clear	0		3	SW.	1	N.	10
	6	N.	2	N.	10		6	NW.	1	Clear	0		6	S.	1	C. K.	10
	9	NE.	2	K.	10		9	W.	1	Clear	0		9	SW.	1	C. K.	7
	Noon	N.	1	K.	10		Noon	SE.	1	C. K.	3		Noon	S.	1	C. K.	8
	3	NW.	2	K.	10		3	S.	2	C. K.	3		3	NW.	3	C. K.	3
	6	NW.	1	C. S.	1		6	S. SE.	2	C. K.	10		6	NW.	3	C. K.	2
	9	NW.	1	C. S.	2		9	S.	2	Haze			9	NW.	3	C. S.	1
May 7	0	NW.	1	C. K.	4	May 8	0	S.	2	C. K.	6	May 9	0	SE.	2	C. K.	10
	3	NW.	1	Clear	0		3	SE.	2	N.	10		3	NE.	1	C. K.	10
	6	N. NW.	2	C. K.	3		6	S.	1	K.	10		6	NE.	1	K.	10
	9	N. NW.	2	C. K.	2		9	SE.	2	C. K.	10		9	S.	1	Haze	
	Noon	NW.	1	C. K.	3		Noon	S. SE.	2	C. K.	10		Noon	SE.	1	C. K.	6
	3	E.	1	C. K.	8		3	S.	2	C. K.	9		3	SE.	1	C. K.	4
	6	SE.	2	C. K.	8		6	E.	2	C. K.	7		6	SE.	2	C. K.	8
	9	SE.	2	C. K. S.	1		9	E.	1	C. K.	10		9	S.	3	C.	3

REMARKS.

April 26. A lunar halo at 1^h 30^m a. m.
27. Began to rain at noon, and continued till 3^h p. m. on the 28th ; amount, 1.260 inch.
29. Lightning in the west at 8^h p. m.; light rain at 11^h 55^m p. m.
May 4. Rain at 3^h a. m.; amount, 0.320 inch.
7. Lightning in the northeast at midnight.
8. Lightning in the west at midnight.
9. Light rain in the morning ; amount, 0.060 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. May 10	0	S.	2	Haze		1875. May 11	0	S. SW.	1	C. S.	1	1875. May 12	0	S.	1	C. K.	3
	3	SW.	2	C. S.	1		3	SW.	1	Clear	0		3	S.	2	C. K. S.	7
	6	W.	1	. K.	6		6	NW.	1	Clear	0		6	S. SW.	3	C. K. S.	9
	9	W. NW.	1	C. K.	10		9	S.	1	Clear	0		9	S. SW.	3	C. K.	4
	Noon	NW.	3	N.	10		Noon	S. SE.	1	C. K.	4		Noon	SW.	3	C. K.	9
	3	NW.	1	C. K.	8		3	S.	2	C. K.	4		3	NW.	3	C. K.	2
	6	W.	2	C. K.	2		6	S.	2	C. K.	8		6	NW.	3	C. K.	2
	9	S.	1	C. K.	2		9	S.	1	Clear	0		9	NW.	3	Clear	0
May 13	0	NW.	2	Clear	0	May 14	0	S.	1	Clear	0	May 15	0	S.	2	C. K.	7
	3	NW.	1	Clear	0		3	SW.	1	Clear	0		3	S.	1	C. K.	2
	6	NW.	1	C.	4		6	NE.	1	Haze			6	SW.	1	C. K.	2
	9	NW.	1	C.	2		9	SE.	1	Haze			9	W.	1	Haze	
	Noon	S.	1	C. K.	4		Noon	S.	1	Haze			Noon	NW.	3	C. K.	4
	3	S.	2	C. K.	5		3	S.	2	C.	2		3	NW.	4	C. K.	10
	6	S.	1	C. K.	10		6	SE.	2	Haze			6	N.	1	N.	10
	9	S.	1	C.	1		9	S.	1	C. K.	9		9	NW.	2	C. K.	9
May 16	0	NW.	1	C. K.	2	May 17	0	NE.	1	Haze		May 18	0	NW.	1	C. K.	7
	3	NW.	1	Clear	0		3	N.	1	Clear	0		3	NW.	1	Haze	
	6	NW.	1	Clear	0		6	NW.	1	Haze			6	NW.	1	Haze	
	9	N. NW.	2	C. K.	4		9	NE.	1	Clear	0		9	NE.	1	C. K.	9
	Noon	NW.	2	C. K.	2		Noon	NW.	1	C. K.	1		Noon	S.	1	C. K.	10
	3	NW.	2	Haze			3	NE.	1	C. K.	4		3	S. SE.	1	C. K.	10
	6	N.	2	Haze			6	S.	1	C. K. S.	6		6	S.	1	C. K. S.	6
	9	N. NW.	1	C.	1		9	SW.	1	C.	1		9	NE.	1	C. K.	7
May 19	0	SW.	1	C. K.	8	May 20	0	S. SW.	1	C. K.	10	May 21	0	S. W.	1	Haze	
	3	SW.	1	C. K.	8		3	SW.	1	Haze			3	S.	1	Haze	
	6	SW.	1	C. K.	10		6	SW.	2	C. K.	10		6	S.	1	Haze	
	9	NW.	1	C. K.	3		9	SW.	1	Haze			9	SE.	1	Haze	
	Noon	W.	1	C. K.	3		Noon	SW.	2	Haze			Noon	SE.	1	Haze	
	3	NW.	2	C. K.	7		3	S. SW.	2	Haze			3	S.	2	Haze	
	6	E.	1	C. K.	6		6	SW.	1	Haze			6	S.	1	C. K.	7
	9	SE.	1	C.	4		9	S.	1	Haze			9	S.	1	C. K.	8
May 22	0	N.	1	C. K.	9	May 23	0	NW.	2	C. K.	6	May 24	0	S.	1	C. S.	4
	3	W.	1	C. K.	9		3	NW.	1	Haze			3	S.	1	C.	3
	6	W.	1	C. K.	10		6	NW.	1	Haze			6	S.	1	C. K.	9
	9	S.	1	C. K.	7		9	W.	1	Haze			9	SE.	1	C. K.	10
	Noon	SE.	1	C. K.	6		Noon	S.	1	Haze			Noon	SE.	1	C. K.	10
	3	SE.	1	C. K.	6		3	SE.	1	C. K.	5		3	SE.	2	C. K.	10
	6	SW.	1	C. K.	9		6	SE.	1	C. K.	6		6	SE.	1	N.	10
	9	W. NW.	1	Haze			9	S.	1	C.	2		9	S.	1	C. K.	10

REMARKS.

May 24. Rain at intervals during the day; amount, 0.618 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. May 25	0	SE.	1	N.	10	1875. May 26	0	NE.	1	C. K.	6	1875. May 27	0	NE.	1	Haze	
	3	SE.	1	N.	10		3	N.	2	C.	4		3	N.	1	Clear	0
	6	E.	1	N.	10		6	N.	1	C.	4		6	NE.	1	Clear	0
	9	E.	1	K.	10		9	N.	1	Haze			9	E.	2	Haze	
	Noon	S.	1	C. K.	9		Noon	N.	2	Haze			Noon	E.	2	Haze	
	3	NE.	1	C. K.	9		3	N.	1	C. K.	4		3	E.	2	Haze	
	6	E.	2	C. K.	4		6	NE.	1	Clear	0		6	SE.	1	Clear	0
	9	NE.	1	C. K. S.	2		9	NE.	1	Clear	0		9	SE.	1	Clear	0
May 28	0	SE	1	Clear	0	May 29	0	NW.	1	Clear	0	May 30	0	W.	2	C. K.	3
	3	NW.	1	Clear	0		3	SW.	1	C.	2		3	NW.	2	Clear	0
	6	N. NW.	1	Haze			6	S.	1	Clear	0		6	NW.	2	Clear	0
	9	SE.	1	Haze			9	S.	1	C.	4		9	N. NW.	3	Clear	0
	Noon	S.	1	Haze			Noon	S.	2	C. K.	4		Noon	W. NW.	2	Clear	0
	3	W.	1	Haze			3	S.	2	C. K.	9		3	N.	2	Clear	0
	6	S.	1	Haze			6	NW.	2	N.	10		6	N.	2	Clear	0
	9	S.	1	Clear	0		9	NW.	3	C. K.	4		9	NW.	1	Clear	0
May 31	0	NW.	1	Clear	0												
	3	NW.	1	Clear	0												
	6	NW.	1	C.	1												
	9	N.	1	S.	1												
	Noon	W. NW.	1	Clear	0												
	3	SE.	1	Clear	0												
	9	S.	1	Clear	0												
	9	S.	1	Clear	0												
June 1	0	SW.	1	Clear	0	June 2	0	SE.	2	K.	10	June 3	0	S.	2	K.	10
	3	NW.	1	Haze			3	SE.	1	K.	10		3	S. SE.	2	C. K.	10
	6	E. SE.	1	C. K.	10		6	SE.	1	C. K.	10		6	SE.	1	K.	10
	9	SE.	2	C. K.	4		9	SE.	2	C. K.	10		9	S.	2	C. K.	10
	Noon	S.	2	C. K.	8		Noon	S.	1	C. K.	10		Noon	SE.	1	C. K.	10
	3	S.	3	C. K.	6		3	S.	2	K.	10		3	SE.	1	C. K.	6
	6	SE.	2	C. K.	9		6	E.	2	C. K.	10		6	SE.	2	C. K.	9
	9	SE.	2	C. K.	7		9	S. SE.	2	K.	10		9	SE.	2	C. K. S.	7
June 4	0	S.	1	Haze		June 5	0	NE.	1	Clear	0	June 6	0	NE.	1	C. K.	2
	3	S.	1	C. K.	9		3	NE.	1	Clear	0		3	SW.	1	C. K.	9
	6	N. NE.	1	C. K.	3		6	SE.	1	C. K.	8		6	S.	1	Haze	
	9	NE.	2	C.	3		9	S.	1	C. K.	8		9	NW.	3	C. K.	9
	Noon	N.	1	C. K.	4		Noon	S.	3	C. K.	9		Noon	NW.	1	C. K.	8
	3	SE.	1	C. K.	4		3	S.	3	C. K.	10		3	W.	1	C. K.	10
	6	S.	1	C. K.	3		6	NE.	1	N.	10		6	SW.	1	C. K.	4
	9	S.	1	C. K.	2		9	NE.	1	E.	1		9	SW.	1	N.	10

REMARKS.

May 29. Lightning in the southwest during the evening.
June 4. A light shower of rain at 2^h 30^m a. m.
5. Rain at 6^h p. m.; amount, 0.700 inch.
6. Rain at 8^h 40^m p. m., and at intervals on the 7th.; amount, 1.180 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. June	0	SW.	1	N.	10	1875. June 8	0	NW.	1	C. K.	9	1875. June 9	0	NE.	1	C. K.	9
	3	S.	1	C. K.	10		3	W.	1	C. K.	9		3	N.	1	C. K.	10
	6	SW.	1	C. K.	9		6	W.	1	C. K.	9		6	NE.	1	Haze	
	9	SW.	2	C. K.	9		9	NW.	2	C. K.	9		9	NE.	2	C. K.	9
	Noon	NW.	3	N.	10		Noon	N. NW.	1	C. K.	8		Noon	NE.	2	C. K.	9
	3	NW.	3	N.	10		3	N. NW.	1	C. K.	9		3	E.	2	C. K.	8
	6	NW.	1	C. K.	10		6	NE.	1	C. K.	10		6	E. NE.	3	C. K.	7
	9	NW.	1	C. S.	6		9	NE.	1	K.	10		9	E.	1	Clear	0
June 10	0	E.	1	C. K.	3	June 11	0	S.	1	Clear	0	June 12	0	S. SW.	1	C. K.	8
	3	N. NE.	1	C. K.	9		3	SW.	1	C. K.	2		3	S.	2	C. K.	5
	6	NW.	1	Haze			6	W.	1	Haze			6	SW.	2	C. K.	5
	9	NW.	1	Clear	0		9	SE.	1	Haze			9	S.	1	N.	10
	Noon	SE.	1	C. K.	4		Noon	S.	1	C. K.	2		Noon	SE.	1	N.	10
	3	S.	1	C. K.	7		3	S.	2	C. K.	7		3	S.	1	N.	10
	6	S.	1	C.	4		6	S.	1	C. K.	8		6	S.	1	C. K.	9
	9	S.	1	Clear	0		9	SE.	2	C. K.	8		9	S. SW.	1	C. K.	9
June 13	0	NW.	2	C.	3	June 14	0	W.	2	C. K.	8	June 15	0	S.	1	C. K.	4
	3	N. NW.	3	C.	1		3	W. NW.	2	C. K.	10		3	S.	1	Clear	0
	6	NW.	3	S.	1		6	NW.	2	C. K.	7		6	SW.	1	Clear	0
	9	N.	3	Clear	0		9	SE.	2	C. K.	4		9	NE.	1	C. K.	5
	Noon	N. NW.	3	C. K.	1		Noon	NW.	1	C. K. S.	2		Noon	S.	1	C. K.	10
	3	NW.	2	C. K.	4		3	W.	1	C. K.	2		3	SE.	1	C. K.	10
	6	N.	2	C. K.	2		6	S.	1	C. K.	3		6	S. SW.	1	N.	10
	9	NW.	1	Clear	0		9	S.	1	C. K.	7		9	S.	1	K.	10
June 16	0	S.	2	N.	10	June 17	0	NW.	1	Clear	0	June 18	0	E.	1	N.	10
	3	NE.	1	N.	10		3	N.	1	Clear	0		3	S.	1	K.	10
	6	N.	1	K.	10		6	S.	1	Clear	0		6	NW.	1	C. K. S.	5
	9	N.	2	C. K.	9		9	S.	1	C.	1		9	W.	1	C. K.	9
	Noon	N.	1	C. K.	9		Noon	S.	2	C. K.	2		Noon	NW.	3	C. K.	10
	3	S.	1	C. K.	10		3	S.	2	C. K.	5		3	NW.	3	C. K.	9
	6	W.	1	C. K.	3		6	S.	2	C. K.	10		6	N. NW.	2	Clear	0
	9	W. NW.	1	Clear	0		9	S.	2	C. K.	10		9	NW.	1	Clear	0
June 19	0	NW.	1	Haze		June 20	0	NW.	1	C. K.	9	June 21	0	SE.	1	Clear	0
	3	NW.	3	Haze			3	NW.	1	C. K.	9		3	NE.	1	Clear	0
	6	NW.	3	Haze			6	N. NW.	1	C. K.	10		6	NE.	1	Clear	0
	9	NW.	3	Haze			9	E.	1	C. K.	5		9	E.	1	Haze	
	Noon	NW.	2	Haze			Noon	S.	1	C. K.	7		Noon	S.	2	C.	2
	3	W. NW.	2	Haze			3	E. SE.	1	C. S.	3		3	S.	2	Clear	0
	6	W. NW.	2	C. K.	4		6	S.	1	Clear	0		6	S.	1	Clear	0
	9	W.	1	Haze			9	E.	1	Clear	0		9	S.	2	C. K.	2

REMARKS.

June 12. Rain at 9h a. m.; amount, 0.390 inch.
15. Light shower at 6h p. m.; amount, 0.084 inch.
17. Light rain in the evening; amount, 0.104 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. June 22	0	NW.	1	Clear	0	1875. June 23	0	S.	1	C. K.	10	1875. June 24	0	S.	1	C. K.	2
	3	NW.	1	Haze			3	S.	1	C. K.	6		3	S.	1	Clear	0
	6	SE.	1	Haze			6	S.	1	C. K.	9		6	S.	1	Clear	0
	9	S.	1	C. K.	4		9	S.	1	C. S.	4		9	SW.	1	Clear	0
	Noon	S.	2	C. K.	6		Noon	W. W.	2	C. K.	4		Noon	SE.	1	C.	1
	3	S.	2	C. K.	8		3	W.	1	C. K.	4		3	S.	1	C. K.	2
	6	SE.	2	C. K.	8		6	S, SE.	1	C. K.	4		6	S.	1	C. K.	2
	9	S.	2	C. K.	9		9	S.	1	Clear	0		9	S.	1	Clear	0
June 25	0	S.	1	C. K.	2	June 26	0	SW.	1	C. K.	7	June 27	0	S.	1	C. K.	2
	3	S.	1	C. K.	1		3	SW.	1	Clear	0		3	SW.	1	C. K.	4
	6	S. SW.	1	C. K.	2		6	SW.	1	Clear	0		6	S.	1	C. K.	4
	9	SE.	1	C. S.	4		9	NW.	2	Clear	0		9	S.	1	C. K.	2
	Noon	W.	1	C. K.	5		Noon	W.	2	C. K.	6		Noon	S.	1	C. K.	4
	3	SE.	2	C. K.	4		3	NW.	1	K.	10		3	S.	1	C. K.	3
	6	NW.	2	C. K.	8		6	E.	1	C. K.	3		6	SW.	1	N.	9
	9	E.	1	C. K.	6		9	Calm.	0	C. K.	7		9	SW.	1	C. K.	8
June 28	0	SW.	1	C. K.	2	June 29	0	S.	1	C. K.	2	June 30	0	SW.	1	N.	10
	3	.	1	C. K.	3		3	E.	1	C. K.	3		3	W.	1	C. K.	10
	6	.	1	C. K.	3		6	S. SE.	1	C. K.	9		6	W.	1	C. K.	8
	9	S. SW.	1	C. K.	6		9	NW.	1	C. K.	2		9	NW.	1	C. K.	5
	Noon	NW.	1	C. K.	8		Noon	NW.	2	C. K.	4		Noon	NW.	2	C. K.	6
	3	N.	1	C. K.	6		3	W. SW.	3	C. K.	4		3	W. NW.	1	C. K.	7
	6	W.	1	N.	10		6	SW.	2	C. K.	4		6	SW.	1	C.	3
	9	W.	1	C. K.	6		9	W.	1	C. K.	8		9	SW.	1	Clear	0
July 1	0	W.	2	Clear	0	July 2	0	Calm	0	C. K.	10	July 3	0	SE.	1	C. K.	2
	3	NW.	2	Clear	0		3	NE.	2	N.	10		3	E.	1	C. K.	10
	6	SW.	1	C. K.	8		6	NE.	1	C. K.	10		6	E.	1	C. K.	10
	9	NW.	1	C. K.	10		9	NE.	2	C. K.	10		9	S. SE.	1	C. K.	7
	Noon	NW.	2	C. K.	6		Noon	W. SW.	1	C. K.	10		Noon	SE.	1	C. K.	9
	3	NW.	1	C. K.	7		3	SW.	1	C. K.	10		3	SE.	1	C. K.	9
	6	N.	2	C. K.	6		6	SW.	1	C. K.	10		6	SE.	2	C. K.	10
	9	N.	1	C. K.	4		9	SE.	1	C. S.	3		9	S.	1	Haze	
July 4	0	S. SE.	2	Haze		July 5	0	S.	2	C. S.	3	July 6	0	S.	1	Clear	0
	3	SE.	1	C. K.	6		3	S.	1	C. K.	8		3	S.	1	C. K.	6
	6	S.	1	C. K.	8		6	S.	1	C. K.	7		6	S.	1	C. K.	5
	9	SE.	1	C. K.	9		9	S.	1	C. K.	8		9	E. SE.	1	C. K.	2
	Noon	S.	1	C. K.	10		Noon	SE.	1	C. K.	8		Noon	E. SE.	1	C. K.	7
	3	S.	2	C. K.	9		3	S.	1	C. K.	7		3	SE.	1	C. K.	7
	6	S.	2	C. K.	9		6	S. SE.	2	C. K.	4		6	N.	4	C. K.	10
	9	S.	2	C. K.	5		9	S.	1	C. K.	3		9	SE.	1	C. K. S.	10

REMARKS.

June 22. Light rain in the evening; amount, 0.012 inch.
26. Light rain at 2^h 20^m p. m.; amount, 0.082 inch.
27. Light rain at 4^h 35^m p. m.
28. Showers during the evening; amount, 0.516 inch.
July 2. Rain at 2^h a. m.
6. Light showers in the evening; amount, 0.130 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. July 7	0	S.	1	K.	10	1875. July 8	0	W.	2	C. K.	3	1875. July 9	0	SE.	1	C. S.	2
	3	W.	1	C. K.	8		3	NW.	1	C. K.	10		3	NE.	1	C. K.	10
	6	W.	1	C. K. S.	6		6	N.	1	S.	1		6	NE.	1	C. K.	10
	9	NW.	1	C. K.	8		9	E. NE.	2	Clear	0		9	E.	1	C. K.	10
	Noon	NW.	1	C. K.	10		Noon	NE.	2	C. K.	3		Noon	SE.	1	C. K.	9
	3	NE.	2	C. K.	8		3	E.	2	C. K.	4		3	E. SE.	2	C. K.	9
	6	E.	1	C. K.	4		6	E. SE.	1	C. K.	2		6	S.	1	C. K.	10
	9	S.	1	C. K.	2		9	S.	1	C. N.	2		9	S.	1	C. K.	9
July 10	0	SE.	1	K.	10	July 11	0	SW.	1	C. K.	3	July 12	0	NW.	1	C. K.	4
	3	S.	1	K.	10		3	W.	1	C. K.	6		3	NW.	1	K.	10
	6	S.	1	K.	10		6	NW.	2	C. K.	9		6	N.	1	C. K.	10
	9	SW.	1	C. K.	9		9	NW.	1	C. K.	10		9	NW.	1	N.	10
	Noon	W.	1	C. K.	9		Noon	NW.	2	C. K.	5		Noon	SW.	1	N.	10
	3	NW.	1	C. K.	10		3	W. NW.	3	C. K.	6		3	SW.	1	K.	10
	6	W.	1	N.	10		6	NW.	2	C. K.	7		6	SW.	1	C. K.	10
	9	SW.	1	N.	10		9	N.	1	C. K.	8		9	W.	1	C. K.	4
July 13	0	W. NW.	1	C. K. S.	3	July 14	0	W.	1	C. K.	10	July 15	0	S. SE.	1	C. K.	2
	3	NW.	1	C. K.	1		3	NW.	1	C. K.	9		3	SW.	1	C. K.	2
	6	NW.	1	Fog			6	NW.	1	C. K.	10		6	SW.	1	C. K.	8
	9	SE.	1	C.	3		9	W.	1	Haze			9	SE.	1	C. K.	6
	Noon	SE.	2	C. K.	4		Noon	NW.	2	C. K.	10		Noon	SE.	2	C. K.	9
	3	SW.	2	C. K.	4		3	NW.	1	C. K.	10		3	SE.	3	C. K.	9
	6	SW.	2	C.	4		6	W.	1	C. K.	6		6	SE.	2	C. K.	9
	9	SW.	1	C.	2		9	SW.	1	C. S.	3		9	N.	3	N.	10
July 16	0	N.	1	C. K.	5	July 17	0	NW.	2	Clear	0	July 18	0	S.	1	C. K.	10
	3	N.	2	C. K.	3		3	NW.	1	C. K. S.	3		3	S.	1	C. K.	3
	6	NW.	2	Clear	0		6	NE.	1	C. K.	8		6	S. SE.	1	C. K.	8
	9	NW.	3	C. K.	2		9	NW.	1	N.	10		9	S. SW.	1	C. K.	1
	Noon	NW.	3	C. K.	6		Noon	W.	3	C. K.	8		Noon	SW.	3	C. K.	4
	3	W.	2	C. K.	8		3	W.	1	C. K.	9		3	NW.	3	C. K.	6
	6	W.	1	C.	3		6	N. NW.	1	C. K.	2		6	NW.	2	C. K. S.	4
	9	NW.	2	C.	1		9	NE.	1	C. K. S.	6		9	N.	2	C. K.	9
July 19	0	N.	1	C.	1	July 20	0	SW.	1	C. K.	10	July 21	0	S.	1	C. K.	7
	3	N.	2	C. K.	9		3	E.	1	C. K.	10		3	SW.	1	C. K.	8
	6	NE.	2	C. K.	4		6	SW.	1	N.	10		6	NW.	1	Haze.	
	9	NE.	2	C. K.	7		9	S.	1	C. K.	10		9	S. SE.	1	C. K.	10
	Noon	E. NE.	1	C. K.	8		Noon	S.	1	C. K.	10		Noon	S. SE.	1	C. K.	9
	3	NE.	1	C. K.	5		3	S.	1	N.	10		3	W. SW.	1	C. K.	9
	6	S.	2	C. K.	8		6	S.	1	C. K.	10		6	NW.	1	C. K. S.	9
	9	S.	1	K.	10		9	S.	1	K.	10		9	NW.	1	C.	2

REMARKS.

July 10. Rain at 6^h p. m.; amount, 0.042 inch.
15. Heavy shower at 9^h p. m.; amount, 1.486 inch.
17. Light rain in the morning; amount, 0.040 inch.
20. Rain at 5^h 40^m a. m.; amount, 0.102 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. July 22	0	W.	1	C. K.	4	1875. July 23	0	S.	1	C. K.	9	1875. July 24	0	N. NE.	1	C. K.	6
	3	NW.	1	C. K.	2		3	SW.	3	C. K.	10		3	NW.	1	C. K.	4
	6	W.	1	Haze			6	W.	1	C. K.	10		6	NW.	1	C. K.	3
	9	NE.	1	C. K.	4		9	NW.	2	C. K.	6		9	N.	2	C. K.	4
	Noon	E. SE.	1	C. K.	9		Noon	W. NW.	1	C. K.	8		Noon	NW.	1	Haze	
	3	S.	1	N.	10		3	W. NW.	1	C. K.	2		3	W.	1	Haze	
	6	SE.	1	C. K.	10		6	W.	1	C. K.	4		6	N. NW.	1	Haze	
	9	S.	1	K.	10		9	W.	2	N.	10		9	N. NW.	1	Haze	
July 25	0	NW.	1	Haze		July 26	0	S.	1	C.	2	July 27	0	W.	1	C. S.	2
	3	NW.	1	C. K.	4		3	S.	1	C. K.	6		3	NW.	1	C.	1
	6	NW.	1	C. K.	8		6	SW.	1	C. K.	8		6	SW.	1	C. K.	8
	9	W.	1	Haze			9	SW.	1	C. K.	4		9	S.	1	C. K.	7
	Noon	SE.	1	Haze			Noon	W.	2	C. K.	8		Noon	W.	1	C. K.	9
	3	SE.	1	C. K.	8		3	W.	2	C. K.	7		3	W.	2	N.	10
	6	S.	1	C. K.	10		6	NW.	1	C. K.	6		6	SW.	1	C. K.	8
	9	S.	1	Haze			9	W. SW.	1	C. K. S.	3		9	S.	1	Haze	
July 28	0	S.	1	Haze		July 29	0	SW.	1	C. K.	10	July 30	0	NW.	1	C. K.	1
	3	SW.	1	C. K.	6		3	N.	1	K.	10		3	N.	1	Clear	0
	6	SW.	1	C. K.	8		6	NE.	1	K.	10		6	S.	1	C. K. S.	4
	9	W.	1	N.	10		9	SE.	1	K.	10		9	S.	1	C. K.	9
	Noon	NE.	2	C. K.	10		Noon	S.	1	N.	10		Noon	SW.	1	N.	10
	3	NE.	2	C. K.	7		3	S.	2	K.	10		3	SW.	1	C. K.	9
	6	NE.	1	C. K.	9		6	W. NW.	1	C. K.	8		6	SW.	1	C. K.	5
	9	NE.	1	N.	10		9	NW.	1	Clear	0		9	SW.	1	Haze	
July 31	0	S.	1	K.	10												
	3	S.	1	K.	10												
	6	SW.	1	C. K.	8												
	9	NE.	1	N.	10												
	Noon	NE.	2	C. K.	10												
	3	NE.	1	C. K.	9												
	6	N.	1	C. K.	9												
	9	NE.	1	K.	10												
Aug. 1	0	NE.	1	N.	10	Aug. 2	0	NE.	1	N.	10	Aug. 3	0	NE.	1	K.	10
	3	NE.	1	K.	10		3	NE.	2	N.	10		3	N.	1	K.	10
	6	NE.	1	K.	10		6	N.	1	N.	10		6	NW.	1	K.	10
	9	NE.	2	K.	10		9	NE.	1	K.	10		9	NW.	1	K.	10
	Noon	NE.	2	K.	10		Noon	NE.	2	K.	10		Noon	S.	1	K.	10
	3	E. NE.	2	K.	10		3	NE.	2	K.	10		3	S.	1	C. K.	9
	6	NE.	2	N.	10		6	NE.	2	K.	10		6	S. SE.	1	N.	10
	9	NE.	1	K.	10		9	NE.	2	K.	10		9	S.	1	K.	10

REMARKS.

July 22. Rain at 3^h p. m.; amount, 0.354 inch.
23. Light rain at 9^h p. m.; amount, 0.016 inch.
27. Showers during the evening; amount, 0.470 inch.
28. Showers during the evening; amount, 0.474 inch.
29. Light rain at noon; amount, 0.008 inch.
30. Rain at 9^h a. m.; amount, 0.380 inch.
August 2. Rain during the morning; amount, 1.850 inch.
3. Several showers from 5^h to 8^h p. m.; amount, 0.430 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force					Direction.	Force.					Direction.	Force.		
1875. Aug. 4	0	SW.	1	C. K.	10	1875. Aug. 5	0	S. SW.	1	C. K.	8	1875. Aug. 6	0	SE.	1	Clear	0
	3	S. SW.	1	C. K.	9		3	NW.	1	C. S.	1		3	SE.	1	Clear	0
	6	S. SW.	2	C. K.	10		6	NW.	1	C. K.	3		6	SE.	1	C.	3
	9	SE.	1	C. K.	10		9	W.	1	C. K.	2		9	S.	2	C. K.	3
	Noon	SE.	2	C. K.	7		Noon	W.	1	C. K.	2		Noon	S.	2	C. K.	3
	3	S. SE.	1	C. K.	9		3	NW.	1	C. K.	3		3	S.	3	C. K.	3
	6	S.	2	C. K.	6		6	SE.	1	C.	2		6	S.	3	C. K.	3
	9	S.	2	C.	2		9	N.	1	Clear	0		9	W.	4	N.	10
Aug. 7	0	SW.	1	K.	10	Aug. 8	0	S.	1	C. K.	9	Aug. 9	0	SW.	1	C.	1
	3	S.	1	N.	10		3	SE.	1	C. K.	9		3	SW.	1	Haze	
	6	S.	1	K.	10		6	NW.	1	C. K.	10		6	W.	1	C. K.	4
	9	S.	2	C. K.	10		9	NW.	1	C. K.	9		9	NW.	1	C. K.	1
	Noon	S.	2	C. K.	8		Noon	NW.	1	C. K.	10		Noon	NW.	1	C. K.	2
	3	S.	2	C. K.	9		3	W.	1	C. K.	8		3	SW.	1	C. K.	3
	6	S.	2	C. K.	9		6	S.	1	C. S.	4		6	NW.	1	Clear	0
	9	W.	2	K.	10		9	SW.	1	C. K.	3		9	NW.	1	Clear	0
Aug. 10	0	NW.	1	Clear	0	Aug. 11	0	W.	2	C. K.	10	Aug. 12	0	S.	2	C. K.	9
	3	NW.	1	Clear	0		3	SW.	1	K.	10		3	S.	2	C. K.	10
	6	SW.	1	C. K.	9		6	S.	1	N.	10		6	S.	2	N.	10
	9	S.	1	C. K.	9		9	S. SW.	1	C. K.	10		9	S.	1	N.	10
	Noon	S. SE.	1	C. K.	3		Noon	S.	1	C. K.	8		Noon	S.	1	C. K.	10
	3	SE.	1	C. K.	4		3	SW.	2	C. K.	9		3	S.	1	C. K.	4
	6	SE.	3	C. K.	6		6	S.	2	C. K.	9		6	SW.	2	N.	10
	9	SE.	2	C. K.	4		9	SW.	1	C. K.	10		9	S.	1	C. K.	10
Aug. 13	0	S. SW.	1	C. K.	9	Aug. 14	0	W.	1	C. K.	2	Aug. 15	0	S.	1	C. K.	10
	3	SW.	1	C. K.	10		3	W.	1	Clear	0		3	SW.	1	C. K.	6
	6	S.	1	N.	10		6	W.	1	C. K.	8		6	NE.	1	C. K.	8
	9	S.	1	C. K.	7		9	SW.	1	C. K.	10		9	SE.	1	C. K.	9
	Noon	S.	1	C. K.	10		Noon	S.	1	C. K.	10		Noon	S. SE.	1	C. K.	10
	3	S.	1	C. K.	9		3	S.	1	C. K.	10		3	S. SW.	1	C. K.	10
	6	SW.	1	K.	10		6	S. SW.	1	N.	10		6	S. SE.	1	C. K.	9
	9	N.	1	C. K.	10		9	S.	1	C. K.	9		9	S.	1	N.	10
Aug. 16	0	S.	1	K.	10	Aug. 17	0	S.	1	N.	10	Aug. 18	0	W.	1	N.	10
	3	S.	1	K.	10		3	SW.	1	C. K.	8		3	W.	1	N.	10
	6	S.	1	K.	10		6	SW.	1	K.	10		6	W.	1	C. K.	9
	9	NW.	1	C. K.	6		9	S. SE.	1	C. K.	9		9	S.	1	K.	10
	Noon	S.	1	C. K.	9		Noon	SE.	1	C. K.	5		Noon	S.	1	C. K.	7
	3	S. SW.	1	C. K.	8		3	S.	1	C. K.	5		3	S. SE.	1	N.	10
	6	SW.	1	C. K.	9		6	NW.	1	C. K.	7		6	SE.	1	K.	10
	9	SW.	1	C. K.	10		9	E.	1	C. K.	10		9	SW.	1	N.	10

REMARKS.

August 6. Shower at $8^h 45^m$ p. m., continuing at intervals through the night; amount, 1.314 inch.
11. Began to rain at 5^h a. m.; amount, 0.140 inch.
12. Shower at 6^h p. m.; amount, 0.290 inch.
13. Shower at 6^h a. m.; amount, 0.018 inch.
14. Shower at 6^h p. m.; amount, 0.006 inch.
15. Shower at 9^h p. m.; amount, 0.078 inch.
17. Shower at $4^h 30^m$ p. m.; amount, 0.096 inch.
18. Heavy showers in the morning and evening; amount, 1.676 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Aug. 19	0	SW.	1	N.	10	1875. Aug. 20	0	W.	1	C. K.	6	1875. Aug. 21	0	NW.	1	lear	0
	3	S.	1	C. K.	4		3	N.	1	C. K.	4		3	SW.	1	S.	1
	6	W.	1	Clear	0		6	NE.	1	C. S.	3		6	W.	1	C. S.	3
	9	S.	1	C. K.	7		9	N.	1	C. K.	3		9	E.	1	C. K.	4
	Noon	S.	1	C. K.	7		Noon	NE.	1	C. K.	8		Noon	SE.	1	C. K.	3
	3	E.	1	C. K.	6		3	E.	1	C. K.	7		3	SE.	1	C.	3
	6	N.	1	C. K.	9		6	S.	1	C. K.	7		6	SE.	1	Clear	0
	9	N.	1	C. K. S.	9		9	SW.	1	C. K. S.	2		9	E.	1	Clear	0
Aug. 22	0	SE.	1	C. K.	8	Aug. 23	0	E.	1	N.	10	Aug. 24	0	E.	2	N.	10
	3	E.	1	C. K.	10		3	E.	1	N.	10		3	NE.	2	N.	10
	6	E.	1	C. K.	10		6	E. NE.	2	N.	10		6	NE.	2	N.	10
	9	E.	1	C. K.	10		9	NE.	1	N.	10		9	NE.	2	N.	10
	Noon	E.	1	C. K.	10		Noon	NE.	1	N.	10		Noon	NE.	2	N.	10
	3	SW.	1	C. K.	10		3	NE.	1	N.	10		3	NE.	2	N.	10
	6	E.	1	C. K.	10		6	E.	2	N.	10		6	NE.	2	K.	10
	9	E.	1	K.	10		9	E.	1	K.	10		9	NE.	1	C. K.	9
Aug. 25	0	NE.	1	C. K.	9	Aug. 26	0	E. SE	1	Clear	0	Aug. 27	0	NE.	2	Clear	0
	3	NE.	1	C. K.	10		3	NW.	1	Clear	0		3	N.	2	Clear	0
	6	NE.	1	C. K.	9		6	NE.	1	C K.	2		6	N.	1	Clear	0
	9	NE.	3	C.	4		9	NE.	2	C. K.	2		9	NE.	2	C. K.	8
	Noon	NE.	2	C. K.	7		Noon	NE.	2	C.	1		Noon	E.	1	C. K.	10
	3	NE.	2	C. K.	6		3	NE.	2	C. K.	3		3	E.	1	C. K.	9
	6	E. NE.	2	C. K.	2		6	E. NE.	2	C.	3		6	E.	2	C. K.	10
	9	E.	1	C. K.	2		9	E.	1	Clear	0		9	E.	2	N.	10
Aug. 28	0	NE.	1	K.	10	Aug. 29	0	NE.	1	K.	10	Aug. 30	0	W.	2	C. K.	3
	3	NE.	1	N.	10		3	NE.	1	K.	10		3	W.	2	C. K.	8
	6	NE.	1	N.	10		6	E.	1	K.	10		6	NE.	2	C. K.	7
	9	E. NE.	1	K.	10		9	E. NE.	1	N.	10		9	E. SE.	1	C. K.	6
	Noon	NE.	1	K.	10		Noon	SW.	2	N.	10		Noon	NE.	1	C. K.	6
	3	NE.	1	K.	10		3	E. NE.	1	N.	10		3	N.	1	C. K.	4
	6	NE.	1	Mist	10		6	E.	1	C. K.	8		6	NE.	1	C. S.	4
	9	NE.	1	K.	10		9	NW.	1	Clear	0		9	NW.	1	Clear	0
Aug. 31	0	NW.	1	C. K.	2												
	3	NW.	1	Clear	0												
	6	N.	1	C. K.	8												
	9	NE.	1	C. K.	6												
	Noon	NE.	2	C. K.	6												
	3	NE.	1	C. K.	6												
	6	SE.	1	C. K.	7												
	9	NW.	1	Clear	0												

REMARKS.

August 23. Heavy rain during the 23d, and continuing until $4^h\ 30^m$ p. m. on the 24th; amount, 3.084 inches.
28. Rain during the morning; amount, 0.420 inch.
29. Rain from 9^h a. m. to $2^h\ 30^m$ p. m.; amount, 2.692 inches.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Sept. 1	0	SE.	1	Clear	0	1875. Sept. 2	0	W.	1	C. K.	2	1875. Sept. 3	0	NE.	1	C. K.	2
	3	S.	1	Fog			3	S.	1	C. K.	3		3	W.	1	C. K.	2
	6	E.	1	Haze			6	E.	1	Haze			6	NE.	1	C. K.	3
	9	E. NE.	1	Haze			9	NE.	1	Clear	0		9	NW.	1	Clear	0
	Noon	E.	1	C. K.	5		Noon	E.	1	Haze			Noon	NE.	1	C.	2
	3	E.	2	C. K.	3		3	E.	1	C. K.	5		3	NE.	1	C. K.	6
	6	E.	1	C. K.	4		6	E.	1	C. K. S.	5		6	SE.	1	C. K. S.	8
	9	NW.	1	Clear	0		9	N.	1	Clear	0		9	SE.	1	Clear	0
Sept. 4	0	S.	1	Clear	0	Sept. 5	0	NW.	1	Clear	0	Sept. 6	0	SE.	1	Clear	0
	3	S.	1	C.	2		3	NW.	1	Clear	0		3	SE.	1	Clear	0
	6	E. SE.	1	C. K.	4		6	N.	2	Clear	0		6	E. SE.	1	Clear	0
	9	E. SE.	1	C. K.	5		9	E.	2	Clear	0		9	E.	1	Clear	0
	Noon	NW.	2	C. K.	2		Noon	E.	2	Clear	0		Noon	NW.	2	C. K.	3
	3	N.	2	C. K.	3		3	N.	1	C.	1		3	NW.	2	C. K.	4
	6	N.	1	Clear	0		6	SE.	1	C. K.	6		6	NE.	1	C. K.	2
	9	NW.	2	Clear	0		9	SE.	1	Clear	0		9	NE.	1	Clear	0
Sept. 7	0	NW.	1	Clear	0	Sept. 8	0	NW.	1	Clear	0	Sept. 9	0	S.	1	Clear	0
	3	NW.	2	Clear	0		3	NW.	1	Fog			3	S.	1	Clear	0
	6	NW.	2	Clear	0		6	NW.	1	Fog			6	E.	1	Haze	
	9	N.	2	Clear	0		9	E. SE.	1	C. K.	3		9	E. SE.	1	C. K.	3
	Noon	E.	2	C.	1		Noon	S.	2	C. K.	2		Noon	SE.	2	C. K.	4
	3	E.	1	C.	1		3	SE.	1	C.	1		3	S.	2	C. K.	2
	6	E.	1	C.	6		6	SE.	1	C. S.	1		6	SE.	1	C. K.	4
	9	E.	1	Clear	0		9	SE.	1	C.	1		9	SE.	1	C. K.	4
Sept. 10	0	SE.	2	C. K	4	Sept. 11	0	N.	2	S.	2	Sept. 12	0	E.	1	C. K.	3
	3	SE.	1	C. K.	10		3	N.	2	C. K. S.	6		3	E.	1	C. K.	10
	6	SE.	1	C. K.	9		6	N.	2	C. K. S.	7		6	NE.	1	C. K.	10
	9	SE.	1	C. K.	8		9	NE.	2	C. K.	2		9	NE.	1	C. K.	8
	Noon	S.	2	C. K.	9		Noon	E.	2	C. K.	2		Noon	NE.	2	C. K.	8
	3	W.	3	N.	10		3	E.	2	C. K.	2		3	E.	2	K.	10
	6	N.	3	C. K.	8		6	NE.	2	C. K. S.	6		6	E.	2	N.	10
	9	N.	3	C. K.	6		9	E.	2	C. K.	7		9	E.	1	N.	10
Sept. 13	0	E.	1	C. K.	7	Sept. 14	0	NW.	1	C. K.	9	Sept. 15	0	NW.	1	C. K.	4
	3	E.	1	Haze			3	NW.	1	C. K.	9		3	NW.	1	C. K.	10
	6	E.	1	C. K.	9		6	N. NW.	1	K.	10		6	NW.	1	C. K.	10
	9	NE.	1	C. K.	4		9	N.	1	K.	10		9	S. SE.	1	C. K.	4
	Noon	N.	1	C. K.	9		Noon	S. SE.	1	C. K.	7		Noon	S.	1	C. K	7
	3	N.	1	K.	10		3	NE.	1	C. K.	6		3	S.	1	C. K.	8
	6	N.	1	C. K.	7		6	S.	1	C. K.	4		6	S.	1	C. K.	8
	9	N.	1	C. K.	4		9	N.	1	C.	1		9	S. SE.	1	C. K.	10

REMARKS.

September 10. Light shower at 3^h p. m.; amount, 0.042 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Sept. 16	0	N.	1	C. K.	10	1875. Sept. 17	0	NW.	1	C. K.	1	1875. Sept. 18	0	NW.	1	C. K.	10
	3	N.	1	C. K.	7		3	NW.	1	C. K.	9		3	NW.	2	C. K.	4
	6	NW.	1	C. K.	7		6	NW.	1	C. K.	10		6	NW.	1	C. K.	10
	9	NW.	1	K.	10		9	NW.	2	C. K.	8		9	N.	2	C. K.	8
	Noon	E.	1	K.	10		Noon	NW.	2	C. K.	7		Noon	N.	1	C. K.	10
	3	E.	1	N.	10		3	NW.	2	C. K. S.	10		3	S SW.	1	N.	10
	6	S.	1	C. K. S.	2		6	NW.	3	C. K.	9		6	NW.	1	N.	10
	9	NW.	1	S.	1		9	NW.	3	C. K.	10		9	N.	1	N.	10
Sept. 19	0	NE.	2	N.	10	Sept. 20	0	N.	1	C. K.	2	Sept. 21	0	W.	1	Clear	0
	3	NE.	2	N.	10		3	N. NE.	1	C. K.	10		3	NW.	1	Clear	0
	6	N.	2	N.	10		6	NW.	1	C. K.	10		6	NW.	1	C. K. S.	9
	9	N. NW.	2	N.	10		9	S.	1	C. K.	7		9	NW.	2	C. K.	9
	Noon	N.	1	C. K.	10		Noon	NW.	2	C. K.	6		Noon	NW.	1	C. K.	6
	3	N.	1	C. K.	8		3	NW.	2	C.	3		3	NW.	2	C. K.	4
	6	NW.	1	C. K.	4		6	NW.	2	S.	1		6	NW.	2	C. K. S.	3
	9	NW.	1	Clear	0		9	NW.	3	Clear	0		9	NW.	1	C. K.	10
Sept. 22	0	NW.	2	C. K.	8	Sept. 23	0	NW.	1	C. K.	10	Sept. 24	0	NW.	1	Clear	0
	3	W.	1	C. K.	10		3	NW.	1	C. K.	7		3	NW.	1	Clear	0
	6	NW.	2	C. K.	9		6	N.	1	C. K.	10		6	NW.	1	Fog	
	9	NW.	2	C. K.	5		9	NE.	1	C. K.	6		9	E.	1	Clear	0
	Noon	NW.	2	C. K.	9		Noon	NE.	1	C. K.	9		Noon	SE.	1	Clear	0
	3	W.	1	C. K.	6		3	NE.	1	C. K.	5		3	SE.	1	Clear	0
	6	N.	1	C. K.	9		6	SE.	1	C. K.	8		6	S.	1	Clear	0
	9	NW.	1	C. K.	9		9	SE.	1	Clear	0		9	NW.	1	Clear	0
Sept. 25	0	NW.	1	Clear	0	Sept. 26	0	S.	1	C. K.	10	Sept. 27	0	NW.	1	Clear	0
	3	NW.	1	Clear	0		3	E.	1	N.	10		3	E.	1	Clear	0
	6	W.	1	Clear	0		6	NW.	3	C. K.	10		6	SE.	1	Clear	0
	9	S.	1	Clear	0		9	NW.	2	C. K.	6		9	E. SE.	1	Clear	0
	Noon	S.	1	Clear	0		Noon	NW.	2	C. K.	8		Noon	S.	2	Clear	0
	3	S.	1	C. K.	6		3	NW.	2	C. K.	5		3	SW.	2	Clear	0
	6	S.	1	C. K.	7		6	NW.	2	Clear	0		6	SW.	2	Clear	0
	9	S.	1	K.	10		9	NW.	2	Clear	0		9	SW.	1	Clear	0
Sept. 28	0	S.	1	Clear	0	Sept. 29	0	NW.	1	C. K.	10	Sept. 30	0	S.	1	Haze	
	3	W.	1	Clear	0		3	W.	1	C. K.	9		3	S.	1	C. K.	4
	6	NW.	1	Clear	0		6	N.	1	C. K.	8		6	SW.	1	C. S.	4
	9	E.	1	Clear	0		9	NE.	1	K.	10		9	S.	1	C. K.	2
	Noon	NW.	1	Clear	0		Noon	S.	1	C. K.	4		Noon	SW.	1	C. K.	10
	3	NW.	1	C. K.	3		3	SW.	1	C. K.	2		3	W. SW.	2	C. K.	8
	6	S.	1	C. K.	7		6	S.	1	Clear	0		6	W.	1	C. K.	9
	9	S.	1	C. K.	2		9	S.	1	Clear	0		9	W.	1	C.	2

REMARKS.

September 16. Rain at 3^h p. m.; amount, 0.204 inch.

18. Rain from 3^h p. m. to 9^h a. m. on the 19th; amount, 1.560 inches.

26. Rain at $0^h\ 40^m$ a. m.; amount, 0.060 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Oct. 1	0	SW.	1	K.	10	1875. Oct. 2	0	NW.	2	Clear	0	1875. Oct. 3	0	NW.	1	Clear	0
	3	NW.	3	K.	10		3	NW.	1	Clear	0		3	NW.	1	Clear	0
	6	E.	1	K.	10		6	NW.	2	Clear	0		6	NE.	1	S.	1
	9	SW.	2	C. K.	6		9	NW.	2	Clear	0		9	S.	2	Clear	0
	Noon	W. SW.	3	C. K.	10		Noon	NW.	2	C. K.	1		Noon	S.	2	Clear	0
	3	W. SW.	2	C. K.	10		3	NW.	2	C. K.	2		3	S.	3	Clear	0
	6	NW.	3	C. S.	4		6	W.	1	C. S.	4		6	SW.	1	C. S.	1
	9	NW.	2	C. K.	8		9	NW.	1	Clear	0		9	SW.	1	Clear	0
Oct. 4	0	SW.	1	Haze		Oct. 5	0	NE.	1	C. K.	4	Oct. 6	0	NW.	1	C. K.	4
	3	S.	1	C. S.	3		3	N.	1	Fog			3	NW.	1	C. K.	6
	6	S.	1	C. K. S.	8		6	NW.	1	Fog			6	NE.	1	C. K.	9
	9	S.	1	C. K.	10		9	N.	1	C. K.	9		9	NE.	2	Haze	
	Noon	S.	2	C. K.	10		Noon	NW.	2	K.	3		Noon	E.	3	C. K.	10
	3	SW.	2	C. K.	10		3	N.	2	C. K.	5		3	NE.	3	C. K.	10
	6	S.	1	C. K.	10		6	NW.	1	Clear	0		6	SE.	3	C. K.	10
	9	N.	1	Clear	0		9	NW.	1	Clear	0		9	SE.	2	C. K.	9
Oct. 7	0	S.	1	K.	10	Oct. 8	0	NW.	1	Clear	0	Oct. 9	0	NW.	1	K.	10
	3	S.	1	N.	10		3	NW.	1	Clear	0		3	NW.	1	C. K.	4
	6	NW.	3	K.	10		6	NW.	1	Clear	0		6	N.	1	C. S.	2
	9	N. NW.	3	C. K.	8		9	NW.	1	Clear	0		9	NW.	2	C. K.	4
	Noon	N. NW.	3	C. K.	3		Noon	NW.	1	C. K.	1		Noon	W.	1	C. K.	3
	3	NW.	3	C. K.	4		3	S.	1	C. K.	2		3	SW.	1	C. K.	4
	9	NW.	2	C. K.	3		6	S.	1	C. K.	9		6	E.	1	C. K. S.	2
	9	NW.	2	Clear	0		9	S.	1	C. K.	9		9	E.	1	C. K.	10
Oct. 10	0	E.	1	C. K.	10	Oct. 11	0	N. NW.	1	C. K.	3	Oct. 12	0	N.	2	K.	10
	3	SE.	1	K.	10		3	N.	2	K.	10		3	NW.	3	K.	10
	6	S.	1	K.	10		6	N. NW.	2	N.	10		6	NW.	3	C. K.	6
	9	NW.	2	C. K.	6		9	N. NW.	2	C. K.	10		9	NW.	2	C. K.	1
	Noon	SW.	1	C. K.	7		Noon	NW.	1	C. K.	10		Noon	NW.	2	C. K.	7
	3	S.	1	C. K.	6		3	NW.	1	C. K.	10		3	NW.	2	C. K.	6
	6	S.	1	C. K.	10		6	N.	2	C. K.	10		2	N. NW.	2	C. K.	1
	9	N.	2	C. K.	10		9	NW.	1	C. K.	10		9	NW.	1	Clear	0
Oct. 13	0	NW.	1	C. K. S.	8	Oct. 14	0	N.	1	S.	1	Oct. 15	0	N.	1	C. K.	10
	3	NW.	1	C. K. S.	8		3	N.	1	C. K.	4		3	N.	1	K.	10
	6	N.	1	C. S.	6		6	N. NW.	1	Fog	9		6	NW.	1	K.	10
	9	NE.	1	C. K.	9		9	NE.	1	Haze			9	N. NE.	1	C. K.	8
	Noon	SW.	1	C. K.	1		Noon	N.	2	C. K.	10		Noon	E.	1	C. K.	5
	3	S. SW.	1	C. K.	2		3	N.	1	C. K.	10		3	S.	1	C. K.	3
	6	E.	2	C. K.	4		6	N.	1	C. K.	9		6	E.	2	C. K.	10
	9	NE.	1	Clear	0		9	N.	1	C. K.	9		9	W.	1	N.	10

REMARKS.

October 1. Light showers at intervals; amount, 0.062 inch.
6. Rain at 3^h 10^m p. m.; amount, 0.126 inch.
7. Light shower at 3^h a. m.; amount, 0.203 inch.
15. Rain from 8^h p. m. to noon on the 16th; amount, 0.676 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Oct. 16	0	SE.	1	N.	10	1875. Oct. 17	0	NW.	2	C. K.	3	1875. Oct. 18	0	SE.	1	C. K. S.	7
	3	E.	1	N.	10		3	NW.	3	C. K.	4		3	SE.	1	C. S.	4
	6	N. NW.	2	N.	10		6	NW.	2	C. K.	8		6	SE.	1	C. S.	3
	9	NW.	3	N.	10		9	W.	1	Clear	0		9	SE.	1	C. K.	8
	Noon	NW.	3	N.	10		Noon	SW.	1	Clear	0		Noon	E.	1	C. K.	9
	3	W. NW.	2	C. K.	9		3	S. SW.	2	Clear	0		3	S.	1	C. K.	8
	6	NW.	2	K.	10		6	S.	1	C. K. S.	1		6	NW.	2	C. K.	10
	9	NW.	2	C. K.	4		9	SW.	1	C. K.	4		9	NW.	2	C. K.	9
Oct. 19	0	NW.	3	C. K.	7	Oct. 20	0	NW.	2	Clear	0	Oct. 21	0	SW.	1	Clear	0
	3	NW.	4	C. K.	6		3	NW.	1	Clear	0		3	SE.	1	Clear	0
	6	NW.	3	C. K.	4		6	NW.	1	Clear	0		6	NW.	1	S.	2
	9	NW.	3	C. K.	6		9	NW.	2	Clear	0		9	E.	1	Clear	0
	Noon	NW.	4	C. K.	9		Noon	NW.	3	Clear	0		Noon	NW.	3	Clear	0
	3	NW.	3	C. K.	7		3	NW.	2	Clear	0		3	W.	3	Clear	0
	6	NW.	2	C. K. S.	3		6	NW.	1	C. S.	1		6	E.	1	C. S.	2
	9	NW.	2	Clear	0		9	NW.	1	Clear	0		9	E.	1	Haze	
Oct. 22	0	SE.	1	Haze		Oct. 23	0	SW.	1	Haze		Oct. 24	0	S.	1	C. K.	6
	3	NW.	1	Haze			3	W.	1	Haze			3	SW.	1	C. K.	4
	6	NE.	1	C. K.	4		6	N.	1	C. K.	9		6	NW.	1	C. K.	8
	9	E.	1	Haze			9	E.	1	Haze			9	W.	1	C. K.	9
	Noon	NW.	1	Haze			Noon	E. SE.	1	C. K.	9		Noon	NW.	1	C. K.	6
	3	NW.	1	Haze			3	E. SE.	1	C. K.	7		3	W.	1	C. K.	4
	6	N.	1	Clear	0		6	SE.	1	C. K.	10		6	NW.	1	Clear	0
	9	N.	1	Haze			9	NE.	1	C. K.	9		9	NW.	1	Clear	0
Oct. 25	0	W.	1	Haze		Oct. 26	0	NW.	1	Haze		Oct. 27	0	NW.	1	Clear	0
	3	W.	1	Haze			3	NW.	1	Haze			3	NW.	1	Clear	0
	6	SE.	1	C. K.	2		6	N.	1	C. K. S.	2		6	S.	1	C. S.	1
	9	E.	1	Haze			9	NE.	1	C. K.	3		9	SW.	2	Clear	0
	Noon	W.	1	C. K.	2		Noon	S.	2	Clear	0		Noon	N. NW.	2	C. K.	6
	3	NW.	1	C. K.	2		3	S.	3	C. K.	7		3	N. NW.	2	Clear	0
	6	NW.	1	K. S.	3		6	S.	2	C. K.	10		6	NW.	2	Clear	0
	9	NW.	1	Haze			9	W.	3	K.	10		9	NW.	1	C. K.	4
Oct. 28	0	NW.	1	Haze		Oct. 29	0	S.	1	Clear	0	Oct. 30	0	S.	1	Clear	0
	3	NW.	1	Clear	0		3	SW.	1	Clear	0		3	S. SE.	1	Haze	
	6	NW.	1	C. K. S.	2		6	NW.	1	Clear	0		6	NE.	1	C. K. S.	7
	9	E.	1	C. K.	4		9	E.	1	C. K.	3		9	NE.	1	N.	10
	Noon	SE.	1	C.	1		Noon	SE.	1	C. K.	8		Noon	S.	2	K.	10
	3	S.	1	C. K.	7		3	SE.	1	C. K.	9		3	W.	3	N.	10
	6	SE.	2	C. K.	4		6	SE.	1	C. K.	4		6	NW.	3	C. K. S.	10
	9	SE.	1	C.	3		9	SE.	1	Haze			9	NW.	3	C. K. S.	3

REMARKS.

October 26. Rain at $7^h 10^m$ p. m.; amount, 0.240 inch.
30. Heavy rain at $2^h 50^m$ p. m.; amount, 0.376 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875.						1875.						1875.					
Oct. 31	0	NW.	2	C. K. S.	8												
	3	W. NW.	3	Clear	0												
	6	W. NW.	3	Clear	0												
	9	W.	3	C. K.	2												
	Noon	NW.	4	C. K.	6												
	3	NW.	3	C. K.	9												
	6	W. NW.	3	C. K.	9												
	9	NW.	4	C. K.	10												
Nov. 1	0	NW.	4	C. K.	5	Nov. 2	0	NE.	1	K.	10	Nov. 3	0	NW.	1	Clear	0
	3	NW.	2	C.	2		3	W.	1	C. K.	4		3	W.	1	Clear	0
	6	W.	2	C. K.	8		6	N.	1	C.	4		6	NW.	1	Clear	0
	9	SW.	1	C. K.	2		9	NW.	1	C.	1		9	N. NE.	1	C. K.	10
	Noon	SW.	1	C. K.	10		Noon	NW.	3	C. K.	1		Noon	NW.	1	N.	10
	3	NW.	1	C. K.	10		3	W. NW.	2	C. K.	1		3	E. SE.	1	N.	10
	6	NE.	1	C. K.	10		6	NW.	2	Clear	0		6	E.	1	K.	10
	9	NE.	1	K.	10		9	NW.	2	C. K.	2		9	E.	1	N.	10
Nov. 4	0	NE.	1	N.	10	Nov. 5	0	W.	2	Haze		Nov. 6	0	NW.	1	Clear	0
	3	NE.	1	N.	10		3	W.	1	Haze			3	NW.	1	Clear	0
	6	N.	1	N.	10		6	NW.	1	K.	10		6	NW.	1	Clear	0
	9	N.	1	N.	10		9	NE.	1	C. K.	10		9	W.	1	Clear	0
	Noon	N.	1	C. K.	10		Noon	N.	1	C. K.	10		Noon	S.	1	C. K.	2
	3	N.	1	C. K.	10		3	N.	1	C. K.	8		3	S.	1	C. K.	1
	6	NE.	1	C. K.	8		6	N.	1	C. K.	4		6	SE.	1	C. K.	4
	9	W.	2	Haze			9	N. NW.	1	Clear	0		9	S.	1	S.	2
Nov. 7	0	SE.	1	C. K.	9	Nov. 8	0	E.	1	N.	10	Nov. 9	0	NE.	1	Clear	0
	3	E.	1	C. K.	7		3	SE.	1	N.	10		3	NW.	1	Clear	0
	6	NE.	1	C. K.	10		6	NW.	2	N.	10		6	N.	1	C. K. S.	2
	9	NE.	1	C. K.	10		9	N. NE.	1	N.	10		9	N.	1	C.	2
	Noon	E.	1	K.	10		Noon	N. NE.	2	C. K. S.	7		Noon	SE.	2	C. K. S.	6
	3	N.	1	K.	10		3	N.	2	C.	3		3	E. SE.	2	C. K.	8
	6	E. SE.	1	K.	10		6	N.	1	Clear	0		6	E. SE.	1	K.	10
	9	SE.	1	K.	10		9	N.	1	Clear	0		9	E.	1	K.	10
Nov. 10	0	E.	2	C. K.	10	Nov. 11	0	NW.	2	C. K.	2	Nov. 12	0	W.	1	Clear	0
	3	E.	2	C. K.	10		3	NW.	1	C. K.	7		3	W.	1	Clear	0
	6	NE.	2	N.	10		6	W.	2	C. K.	7		6	NW.	1	Clear	0
	9	N.	1	N.	10		9	NW.	3	C. S.	4		9	SW.	1	Haze	
	Noon	N. NW.	2	N.	10		Noon	NW.	3	C. K.	4		Noon	SE.	1	Clear	0
	3	NW.	2	K.	10		3	NW.	2	Clear	0		3	S.	1	Clear	0
	6	NW.	1	C. K. S.	9		6	NW.	1	Clear	0		6	S.	1	C. S.	1
	9	NW.	1	Clear	0		9	NW.	1	Clear	0		9	SW.	1	Clear	0

REMARKS.

October 31. A few flakes of snow at 3^h 10^m p. m.
November 3. Rain from noon to 9^h a. m. on the 4th; amount, 0.802 inch.
8. Rain during the morning; amount, 0.250 inch.
10. Rain at 3^h 15^m a. m.; amount, 0.656 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Nov. 13	0	S.	1	Clear	0	1875. Nov. 14	0	SE.	1	C. K.	10	1875. Nov. 15	0	NW	1	C. K.	4
	3	NW.	1	C. S.	1		3	SE.	1	C. K.	10		3	N.	1	C. K.	9
	6	W.	1	Clear	0		6	SE.	3	N.	10		6	N.	1	C. K.	10
	9	E.	1	Haze			9	SW.	2	C. K.	9		9	SE.	1	C. K.	10
	Noon	S.	1	Clear	0		Noon	S.	3	C. K.	5		Noon	SE.	1	C. K.	9
	3	S.	1	C. K. S.	6		3	W.	2	C. K.	10		3	S.	2	Clear	0
	6	SE.	1	C. K.	2		6	NW.	1	C. K. S.	9		6	SE.	1	C. K.	10
	9	S. SE.	1	C. K.	10		9	NW.	1	C. K.	1		9	E.	1	C. S.	1
Nov. 16	0	SW.	1	C. K.	10	Nov. 17	0	NW.	3	C. K.	9	Nov. 18	0	NW.	1	C. K.	1
	3	NW.	1	K.	10		3	NW.	3	C. K.	5		3	NW.	1	C.	1
	6	NE.	1	Mist	10		6	NW.	3	C. K.	3		6	NW.	1	C. S.	1
	9	SE.		Fog			9	NW.	3	C. K.	4		9	SE.	1	Clear	0
	Noon	W.	1	K.	10		Noon	NW.	4	C. K.	8		Noon	S.	2	C. K.	6
	3	NW.	5	C. K. S.	4		3	NW.	3	C. K.	2		3	S.	2	C. K.	9
	6	NW.	2	C. K.	2		6	NW.	2	C.	4		6	S.	1	C. K.	10
	9	NW.	3	C. K.	2		9	NW.	1	C.	2		9	S.	1	K.	10
Nov. 19	0	NW.	1	N.	10	Nov. 20	0	SW.	1	C. K.	4	Nov. 21	0	S. SW.	1	K.	10
	3	NW.	1	C. K.	9		3	S. SE.	1	C. K.	2		3	NE.	1	N.	10
	6	S. SW.	1	C. K.	10		6	E.	1	N.	10		6	NE.	1	N.	10
	9	S.	1	C. K.	3		9	NE.	1	N.	10		9	N.	1	N.	10
	Noon	S.	1	C. K.	9		Noon	NE.	2	K.	10		Noon	NE.	1	Fog	
	3	W.	1	C. K.	9		3	NE.	1	K.	10		3	N.	1	C. K.	7
	6	W.	1	K.	10		6	SE.	1	C. K. S.	4		6	NW.	1	C. K.	5
	9	W.	1	K.	10		9	SW.	1	K.	10		9	NW.	1	C. K.	2
Nov. 22	0	NW.	2	C. K.	4	Nov. 23	0	SE.	1	K.	10	Nov. 24	0	S.	1	K.	10
	3	NW.	1	Clear	0		3	SE.	1	K.	10		3	S.	1	K.	10
	6	NW.	1	Clear	0		6	SW.	1	N.	10		6	NW.	2	C. K.	10
	9	N.	1	Clear	0		9	N.	1	N.	10		9	NW.	2	C. K.	7
	Noon	N.	1	C. K.	5		Noon	NW.	2	N.	10		Noon	NW.	3	C. K.	10
	3	SE.	1	C. K.	2		3	NW.	1	N.	10		3	NW.	2	C. K.	7
	6	E.	1	Clear	0		6	S.	1	K.	10		6	NW.	1	C. K.	2
	9	E.	1	Clear	0		9	NE.	1	N.	10		9	NW.	2	Clear	0
Nov. 25	0	NW.	3	Clear	0	Nov. 26	0	SE.	1	K.	10	Nov. 27	0	NW.	1	Fog	
	3	NW.	1	Clear	0		3	E.	1	K.	10		3	NW.	1	C. S.	4
	6	N.	1	Clear	0		6	NE.	1	K.	10		6	NW.	1	C. K.	6
	9	N.	1	Clear	0		9	NE.	1	N.	10		9	N. NE.	1	C. K.	7
	Noon	E. SE.	1	Clear	0		Noon	N.	1	N.	10		Noon	NW.	3	C. K.	1
	3	SE.	1	Clear	0		3	SE.	1	N.	10		3	NW.	2	C. K.	1
	6	SW.	1	Clear	0		6	S.	1	K.	10		6	NW.	1	Clear	0
	9	SE.	1	Clear	0		9	S.	1	Fog			9	N.	1	Clear	0

REMARKS.

November 16. Raining at 10h and 11h a. m.; amount, 0.094 inch.
18. Rain and hail at 10h p. m.; amount, 0.076 inch.
21. Rain during the morning; amount, 0.306 inch.
23. Began to rain at 4h 30m a. m.; amount, 0.840 inch.
26. Rain at 7h a. m.; amount, 0.574 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Nov. 28	0	NE.	1	C. K.	4	1875. Nov. 29	0	SW.	1	C. K.	9	1875. Nov. 30	0	NW.	3	C. K.	2
	3	NE.	1	K.	10		3	SW.	1	C. K.	9		3	NW.	3	C. K.	9
	6	NE.	1	K.	10		6	NW.	1	C. K.	7		6	NW.	2	C. K.	1
	9	NE.	1	C. K.	10		9	NW.	3	C. K. S.	10		9	N.	2	C. S.	5
	Noon	S.	2	C. K.	10		Noon	NW.	3	C. K. S.	10		Noon	NE.	1	C. S.	3
	3	S.	1	K.	10		3	NW.	3	C. K. S.	10		3	N. NE.	1	C. K. S.	8
	6	SE.	1	K.	10		6	NW.	3	C. K. S.	2		6	NE.	1	C. S.	2
	9	SW.	1	C. K.	10		9	NW.	3	S.	1		9	NE.	1	Clear	0
Dec. 1	0	NE.	1	Clear	0	Dec. 2	0	SE.	1	K.	10	Dec. 3	0	NE.	1	C. K.	9
	3	NE.	1	C. K.	0		3	SE.	1	K.	10		3	NW.	1	C. K.	9
	6	NE.	1	C. K.	4		6	NE.	1	C. K.	2		6	NE.	1	K.	10
	9	E.	1	C. S.	4		9	N. NE.	1	C. K. S.	8		9	E.	1	K.	10
	Noon	E.	1	C. K. S.	6		Noon	N. NE.	1	C. S.	2		Noon	N.	1	K.	10
	3	E.	1	C.	2		3	NE.	1	C. S.	3		3	N. NE.	1	N.	10
	6	E.	2	C. K.	10		6	NE.	1	Clear	0		6	NE.	1	N.	10
	9	E.	2	K.	10		9	NE.	2	Haze			9	NE.	1	K.	10
Dec. 4	0	NE.	1	Mist	10	Dec. 5	0	S. SE	1	Fog	10	Dec. 6	0	NE.	1	K.	10
	3	NE.	1	Mist	10		3	SE.	1	Fog	10		3	N.	1	K.	10
	6	E. NE.	1	Mist	10		6	SE.	1	K.	10		6	N.	1	K.	10
	9	NE.	1	N.	10		9	E.	1	K.	10		9	NW.	1	K.	10
	Noon	SE.	1	Fog			Noon	E.	2	Mist	10		Noon	NE.	1	K.	10
	3	SE.	1	Fog			3	E. NE.	2	N.	10		3	E.	1	K.	10
	6	SE.	1	Mist	10		6	NE.	2	N.	10		6	NE.	1	K.	10
	9	SE.	1	K.	10		9	NW.	1	K.	10		9	E.	1	K.	10
Dec. 7	0	E.	1	Fog		Dec. 8	0	NW.	1	N.	10	Dec. 9	0	SE.	1	Fog	10
	3	E. NE.	1	Fog			3	N.	1	K.	10		3	NE.	1	Fog	10
	6	NE.	1	Fog			6	N. NE.	1	K.	10		6	NE.	1	Fog	10
	9	E.	1	Fog			9	NW.	1	Mist	10		9	W.	1	C. K.	10
	Noon	NE.	1	Fog			Noon	E.	1	Mist	10		Noon	NW.	1	N.	10
	3	NE.	1	N.	10		3	E.	1	Fog			3	NW.	1	C. K.	9
	6	NE.	1	N.	10		6	SE.	1	K.	10		6	NW.	1	C. K.	10
	9	NW.	1	N.	10		9	SE.	1	K.	10		9	NW.	2	C. K.	10
Dec. 10	0	NW.	1	C. K.	6	Dec. 11	0	NW.	1	C. K.	10	Dec. 12	0	N.	1	K.	10
	3	NW.	2	C. K. S.	4		3	N.	1	C. K.	10		3	N.	1	C. K.	8
	6	NW.	1	C. K. S.	2		6	NE.	1	C. K. S.	10		6	N.	1	S.	2
	9	NW.	1	C. K.	10		9	S.	1	Haze			9	NW.	1	Clear	0
	Noon	NW.	2	C. K.	9		Noon	S.	1	C. K.	10		Noon	NW.	3	C. K. S.	1
	3	NW.	2	C. K.	4		3	S.	1	C. K.	10		3	NW.	2	C. K.	7
	6	NW.	1	C. K.	4		6	SE.	1	C. K.	10		6	W.	1	C. K.	10
	9	NW.	1	C. K.	10		9	E. SE.	1	C. K.	10		9	W.	1	C. K.	2

REMARKS.

December 3. Began to snow at 11h, changed to rain at 11h 50m a. m., and continued to rain at intervals until 7h p. m. on the 5th; amount, 1.302 inch.

7. Rain at 3h p. m.; amount, 0.260 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Dec. 13	0	S.	1	C. S.	4	1875. Dec. 14	0	NW.	3	C. K.	8	1875. Dec. 15	0	NW.	1	C. K.	1
	3	SW.	1	C. K.	6		3	NW.	3	C. K.	7		3	NW.	1	C. S.	1
	6	S.	1	C. K.	10		6	NW.	3	C.	2		6	NW.	1	Clear	0
	9	W. NW.	2	C. K.	2		9	NW.	2	C. K.	2		9	SW.	1	C. K.	4
	Noon	NW.	4	C. K.	4		Noon	NW.	3	C. K.	9		Noon	S.	1	K.	10
	3	NW.	3	C. K.	2		3	NW.	2	C. K.	9		3	S.	2	C. K.	9
	6	NW.	3	C. K.	6		6	NW.	3	C. K.	9		6	S.	1	C. S.	1
	9	W. NW.	2	C. K.	2		9	NW.	3	C. K.	8		9	S.	1	C. K.	2
Dec. 16	0	S.	1	Clear	0	Dec. 17	0	NW.	2	K.	10	Dec. 18	0	NW.	3	Clear	0
	3	S.	1	Clear	0		3	NW.	1	C. K.	8		3	NW.	2	Clear	0
	6	W.	1	C. K.	1		6	NW.	1	C. K.	4		6	NW.	3	Clear	0
	9	NW.	1	Haze			9	NW.	2	C. K.	9		9	W. NW.	3	Clear	0
	Noon	SE.	1	C. K.	7		Noon	NW.	3	C. K.	9		Noon	W. NW.	3	C. K.	1
	3	E.	1	C. K.	10		3	NW.	5	C. K.	3		3	NW.	2	K.	5
	6	E.	1	K.	10		6	NW.	3	Clear	0		6	NW.	1	C. S.	1
	9	W.	2	K.	10		9	NW.	3	Clear	0		9	NW.	1	C. K.	10
Dec. 19	0	NW.	3	C. K.	2	Dec. 20	0	NW.	1	Clear	0	Dec. 21	0	SW.	1	Clear	0
	3	NW.	2	Clear	0		3	E.	1	C. K.	4		3	SE.	1	Clear	0
	6	NW.	2	C. K.	9		6	E.	1	Clear	0		6	W.	1	Clear	0
	9	NW.	1	C. K.	8		9	E.	1	Haze			9	W.	1	Haze	
	Noon	NW.	3	C. K.	6		Noon	S. SE.	1	Clear	0		Noon	SE.	1	C. S.	3
	3	NW.	2	C. K.	4		3	S.	1	Clear	0		3	SE.	1	C. K. S.	8
	6	NW.	1	Clear	0		6	S.	1	S.	1		6	S.	1	Haze	
	9	NW.	1	Haze			9	S.	1	Clear	0		9	S.	1	K.	10
Dec. 22	0	S.	1	K.	10	Dec. 23	0	NW.	1	Clear	0	Dec. 24	0	E.	1	C. K.	10
	3	S.	1	K.	10		3	NW.	1	Clear	0		3	E.	1	C. K.	10
	6	SW.	1	C. K.	10		6	S.	1	Clear	0		6	E.	2	C. K.	10
	9	E.	1	C. K.	8		9	S. SE.	1	S.	2		9	NE.	1	N.	10
	Noon	N.	1	C. K.	4		Noon	S.	1	C. K.	6		Noon	E. NE.	1	N.	10
	3	E.	1	C. K.	6		3	W.	1	C.	3		3	E.	2	N.	10
	6	S.	1	S.	1		6	NW.	1	Haze			6	E.	1	N.	10
	9	NW.	1	Clear	0		9	E.	1	Haze			9	SW.	1	K.	10
Dec. 25	0	SW.	1	Mist	10	Dec. 26	0	SE.	1	Fog		Dec. 27	0	SE.	1	Fog	10
	3	SW.	1	Fog			3	E.	1	C. K.	10		3	SW.	1	K.	10
	6	NW.	1	Fog			6	E.	1	K.	10		6	NW.	3	K.	10
	9	N.	1	N.	10		9	E.	1	Haze	10		9	NW.	3	C. K.	9
	Noon	NW.	1	Haze			Noon	N. NE.	1	Haze	10		Noon	NW.	2	C. K.	3
	3	S.	1	C. K.	8		3	E.	1	Haze	10		3	NW.	1	Clear	0
	6	N.	1	C. K.	7		6	NW.	1	Fog			6	N.	1	Clear	0
	9	NW.	1	Fog			9	S.	1	Fog			9	NE.	1	Clear	0

REMARKS.

December 15. Light snow squall at 1^{h} 30^{m} p. m.
24. Rain at 9^{h} a. m.; amount, 0.442 inch.
27. Light rain in the morning; amount, 0.158 inch.

Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.	Day.	Hour.	WIND.		Weather.	Portion cloudy.
		Direction.	Force.					Direction.	Force.					Direction.	Force.		
1875. Dec. 28	0	N.	2	C. K.	4	1875. Dec. 29	0	W. SW.	1	K.	10	1875. Dec. 30	0	NE.	1	Mist	10
	3	NE.	1	K.	10		3	W.	1	N.	10		3	N.	1	K.	10
	6	NE.	1	Mist	10		6	NE.	1	N.	10		6	NW.	1	Mist	10
	9	N.	2	N.	10		9	E.	1	N.	10		9	N.	1	Fog	
	Noon	N.	1	N.	10		Noon	NE.	1	N.	10		Noon	NW.	1	Fog	
	3	NE.	1	N.	10		3	E.	1	Mist	10		3	E.	1	Fog	
	6	N.	1	Mist	10		6	E.	1	Mist	10		6	SE.	1	K.	10
	9	N.	1	K.	10		9	E.	1	Mist	10		9	SW.	1	K.	10
Dec. 31	0	SE.	1	Mist	10												
	3	E.	1	Fog													
	6	SE.	1	Mist	10												
	9	SW.	1	Fog.													
	Noon	NW.	1	Haze													
	3	SW.	1	Haze													
	6	SW.	1	K.	10												
	9	S.	1	Mist	10												

REMARKS.

December 28. Rain at 9^h a. m.; amount, 0.570 inch.
29. Rain at 3^h a. m.; amount, 0.170 inch.

METEOROLOGICAL OBSERVATIONS

MEAN MONTHLY AND ANNUAL RESULTS.

1875.

TABLE I.

Monthly Means of Barometric Pressure.

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	in.	in.	in.	in.	in.	in.	in.	in.
January	30.160	30.167	30.160	30.188	30.133	30.102	30.123	30.137
February.	30.053	30.061	30.058	30.076	30.044	30.001	30.018	30.053
March.	29.998	30.004	30.029	30.037	30.014	29.964	29.970	29.997
April	29.905	29.895	29.918	29.933	29.898	29.855	29.860	29.901
May.	29.899	29.892	29.923	29.947	29.918	29.880	29.872	29.898
June	29.943	29.934	29.960	29.974	29.962	29.927	29.919	29.944
July.	29.910	29.902	29.925	29.941	29.925	29.895	29.884	29.905
August	29.938	29.929	29.950	29.973	29.955	29.924	29.917	29.944
September	29.984	29.974	29.991	30.007	29.981	29.943	29.945	29.972
October	29.931	29.931	29.949	29.974	29.933	29.896	29.910	29.939
November	30.016	30.017	30.024	30.056	30.016	29.995	30.016	30.030
December	29.949	29.952	29.959	29.996	29.963	29.935	29.950	29.956
Annual means . . .	29.974	29.972	29.987	30.008	29.978	29.943	29.949	29.973

TABLE II.

Monthly Means of Dry Thermometer.

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	°	°	°	°	°	°	°	°
January	25.4	24.6	23.7	24.9	30.2	31.9	28.8	27.0
February	24.6	22.4	21.0	24.4	32.5	35.4	31.0	26.5
March	35.3	33.4	32.5	36.0	42.5	45.9	41.9	37.4
April.	43.7	41.1	39.9	47.6	54.0	55.3	51.7	46.7
May	56.1	52.9	52.6	63.8	70.6	72.4	67.7	59.9
June	65.9	63.6	63.6	74.3	79.4	80.6	75.9	69.6
July	71.5	69.7	69.8	77.4	83.3	83.7	80.3	74.4
August.	67.8	66.3	65.9	72.2	77.6	78.6	74.2	69.6
September	58.6	56.4	56.0	66.1	73.7	74.9	66.8	61.2
October	48.5	46.6	44.6	52.3	62.8	64.4	55.8	50.9
November	37.8	36.6	35.4	39.5	45.8	46.2	41.7	38.9
December	33.9	32.6	32.5	34.0	39.5	40.3	37.1	35.6
Annual means . . .	47.4	45.5	44.8	51.0	57.7	59.1	54.4	49.8

TABLE III.

Monthly Means of Wet Thermometer.

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	°	°	°	°	°	°	°	°
January . .	25.6	24.8	24.2	26.3	30.5	31.7	28.7	27.1
February . .	25.0	23.7	26.0	26.2	31.3	33.8	31.9	27.9
March . . .	34.1	33.1	32.2	34.5	39.4	41.8	39.2	36.5
April. . . .	42.4	40.3	39.7	44.3	48.1	48.9	47.1	44.1
May	52.8	51.0	51.0	57.4	60.5	60.4	59.2	55.2
June	64.0	62.4	62.6	68.4	70.4	70.5	68.7	66.4
July	70.1	68.8	68.6	72.5	74.9	75.0	74.7	71.4
August. . .	67.7	66.4	66.0	69.6	72.9	73.2	71.7	68.8
September .	57.9	56.0	55.9	62.4	66.7	67.3	63.5	60.3
October . .	47.6	46.3	44.5	50.1	56.5	57.5	52.6	49.4
November .	37.2	36.1	35.3	38.1	42.5	42.9	40.0	37.8
December .	35.8	34.7	34.7	34.5	38.7	39.3	37.8	37.3
Annual means.	46.7	45.3	45.1	48.7	52.7	53.5	51.3	48.5

TABLE IV.

Monthly Means of Sun Thermometer.

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.	°	°	°	°	°	°	°	°
January . .	25.9	24.4	23.3	32.8	70.1	73.0	48.8	27.4
February . .	24.8	22.3	20.2	35.2	83.4	89.0	68.9	27.8
March . . .	36.3	33.5	32.2	65.2	89.8	98.8	94.2	42.1
April. . . .	42.8	40.5	39.0	88.2	108.1	106.7	90.6	49.2
May	50.4	47.8	54.4	110.8	123.3	119.4	76.7	54.7
June	61.6	60.1	70.6	119.2	126.4	118.7	82.2	65.2
July	67.3	66.4	72.5	109.1	125.9	114.0	89.3	70.4
August. . .	65.6	64.1	66.1	101.6	120.3	114.6	80.4	68.0
September .	54.4	53.0	53.9	107.9	117.8	113.4	65.0	56.6
October . .	45.7	43.6	41.2	88.2	105.6	84.2	52.7	47.1
November .	34.0	32.7	32.2	63.8	75.4	51.0	37.3	34.5
December .	31.7	30.3	30.4	51.5	66.1	46.9	34.4	32.9
Annual means.	45.0	43.2	44.7	81.1	101.0	94.1	68.4	48.0

TABLE V.

Amount of Rain and Snow in 1875.

Month.	Rain and Melted Snow.	Snow.
	in.	in.
January	2.330	. .
February	2.900	3.00
March	4.128	6.00
April	2.658	. .
May	0.998	. .
June	3.068	. .
July	3.502	. .
August	12.094	. .
September	1.866	. .
October	1.683	. .
November	3.598	. .
December	2.902	. .
Total	41.727	9.00

TABLE VI.

Showing the number of times that the wind blew from the NORTH *at the hours of observation.*

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.								
January . . .	3	1	2	6	4	1	4	3
February . . .	3	1	5	1	1	1	4	2
March. . . .	1	3	7	5	3	5	7	4
April	3	1	5	8	5	5	6	4
May	1	3	4	5	2	2	3	0
June	0	4	3	2	4	2	1	0
July	3	4	2	1	0	0	5	5
August . . .	0	3	3	1	0	1	1	3
September . .	3	3	6	4	3	4	3	4
October . . .	4	4	7	4	3	3	4	4
November . .	0	1	5	10	6	5	2	3
December . .	2	5	3	4	5	1	3	1
Total . . .	23	33	52	51	36	30	43	33

Showing the number of times that the wind blew from the NORTHEAST *at the hours of observation.*

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.								
January . . .	4	8	5	5	3	3	2	5
February . . .	2	2	2	2	1	1	2	2
March. . . .	3	3	2	3	5	1	4	5
April	4	2	4	2	4	3	3	4
May	2	1	3	4	0	2	1	3
June	3	3	2	3	1	0	2	2
July	0	2	5	4	3	4	1	3
August . . .	7	6	8	8	10	7	5	4
September . .	2	1	2	6	3	3	2	1
October . . .	1	0	4	5	0	1	0	2
November . .	4	3	6	6	3	1	3	3
December . .	5	4	8	2	3	3	5	3
Total . . .	37	35	51	50	36	29	30	37

Showing the number of times that the wind blew from the EAST *at the hours of observation.*

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.								
January . . .	5	3	2	3	1	0	3	1
February . . .	1	1	3	1	2	0	0	3
March. . . .	6	4	3	5	4	2	7	3
April	2	6	3	2	1	1	3	3
May	0	1	2	2	2	3	4	1
June	2	1	1	2	0	1	3	3
July	0	2	1	3	3	2	2	0
August . . .	3	2	3	5	2	5	6	7
September . .	2	4	6	9	6	6	4	3
October . . .	1	1	1	6	4	1	4	2
November . .	2	3	1	1	2	2	4	4
December . .	2	5	4	8	4	10	4	5
Total . . .	26	33	30	47	31	33	44	35

Showing the number of times that the wind blew from the SOUTHEAST *at the hours of observation.*

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.								
January . . .	4	3	4	4	4	6	1	5
February . . .	6	5	4	3	2	1	6	4
March. . . .	4	3	5	2	3	7	3	7
April	4	3	0	3	4	2	0	1
May	3	2	0	5	5	5	6	5
June	2	1	4	5	4	4	3	3
July	3	1	0	4	6	4	3	3
August . . .	2	2	1	2	3	2	5	1
September . .	3	2	2	1	2	2	5	5
October . . .	3	4	2	1	2	1	4	3
November . .	4	3	1	3	3	3	5	2
December . .	5	3	2	0	3	2	4	2
Total . . .	43	32	25	33	41	39	45	41

Showing the number of times that the wind blew from the SOUTH *at the hours of observation.*

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.								
January . . .	1	0	2	1	4	2	3	1
February . . .	4	4	3	8	10	9	6	4
March. . . .	5	4	3	5	3	6	2	2
April	7	4	2	6	4	6	7	8
May	11	5	6	5	10	10	9	12
June	11	10	8	8	10	13	11	11
July	11	6	6	7	4	5	6	10
August . . .	7	5	6	9	12	11	9	5
September . .	5	5	0	4	7	5	8	5
October . . .	4	2	3	2	4	9	5	1
November . .	3	2	1	1	6	6	4	4
December . .	4	2	2	2	4	4	4	5
Total . . .	73	49	42	58	78	86	74	68

Showing the number of times that the wind blew from the SOUTHWEST *at the hours of observation.*

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.								
January . . .	1	2	1	0	0	1	3	2
February . . .	0	2	1	1	2	1	0	0
March. . . .	1	0	0	0	1	1	1	2
April	0	0	1	2	0	0	1	1
May	2	9	4	2	2	0	2	1
June	5	4	4	2	0	0	4	3
July	3	4	7	2	3	4	6	4
August . . .	4	6	2	1	1	3	3	5
September . .	0	0	1	0	1	2	1	1
October . . .	4	2	0	2	4	3	1	2
November . .	3	1	1	3	1	0	1	3
December . .	2	3	1	2	0	1	1	2
Total . . .	25	33	23	17	15	16	24	26

TABLE VI—Continued.

Showing the number of times that the wind blew from the WEST *at the hours of observation.*

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.								
January . . .	1	2	4	4	2	8	5	4
February . . .	3	3	3	5	3	7	3	4
March. . . .	1	3	2	3	4	2	2	2
April	3	4	2	1	4	3	2	1
May	2	1	2	4	5	2	2	1
June	1	3	3	1	3	6	4	4
July	6	2	3	3	6	8	4	3
August . . .	5	3	5	2	1	1	0	2
September . .	2	4	1	0	0	2	0	0
October . . .	1	3	1	2	2	4	2	2
November . .	2	4	3	1	1	3	1	2
December . .	1	1	2	4	1	1	1	3
Total . . .	28	33	31	30	32	47	26	28

Showing the number of times that the wind blew from the NORTHWEST *at the hours of observation.*

Month.	0^h.	3^h.	6^h.	9^h.	Noon	3^h.	6^h.	9^h.
1875.								
January . . .	12	12	11	8	12	9	9	10
February . . .	9	10	7	7	7	8	7	9
March . . .	10	10	9	8	9	9	6	7
April	8	10	13	6	8	9	7	8
May	9	9	10	4	5	7	5	7
June	6	4	5	7	8	4	2	3
July	4	10	7	7	6	4	4	3
August . . .	3	4	3	4	2	1	2	4
September . .	13	11	12	6	8	6	7	11
October . . .	13	15	13	8	12	9	11	15
November . .	12	13	12	5	8	10	10	9
December . .	10	8	10	9	11	9	9	10
Total . . .	109	116	112	79	96	85	79	96

Showing the number of times that it was CALM *at the hours of observation.*

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.								
January . . .	0	0	0	0	0	0	0	0
February . . .	0	0	0	0	0	0	0	0
March. . . .	0	0	0	0	0	0	0	0
April	0	0	0	0	0	0	0	0
May	0	0	0	0	0	0	0	0
June	0	0	0	0	0	0	0	1
July	1	0	0	0	0	0	0	0
August . . .	0	0	0	0	0	0	0	0
September . .	0	0	0	0	0	0	0	0
October . . .	0	0	0	0	0	0	0	0
November . .	0	0	0	0	0	0	0	0
December . .	0	0	0	0	0	0	0	0
Total . . .	1	0	0	0	0	0	0	1

TABLE VII.

Showing the number of times that it was CLEAR *at the hours of observation.*

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.								
January . . .	6	11	6	4	2	1	3	10
February . . .	10	10	8	5	3	3	6	9
March. . . .	3	2	2	6	1	0	2	4
April	4	5	5	5	4	5	2	8
May	8	12	6	5	2	2	5	8
June	6	6	5	4	0	1	3	9
July	3	2	1	1	0	0	0	1
August . . .	5	6	2	0	0	0	2	7
September . .	11	8	6	9	5	2	5	14
October . . .	8	9	5	7	5	5	4	10
November . .	6	6	6	4	3	4	6	8
December . .	6	5	5	2	1	2	4	4
Total . . .	76	82	57	52	26	25	42	92

Showing the number of times that CIRRUS *clouds prevailed at the hours of observation.*

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.								
January . . .	1	0	0	0	1	2	1	0
February . . .	2	0	0	1	1	2	0	2
March. . . .	1	2	0	2	2	2	1	1
April	1	3	2	1	0	0	2	2
May	0	3	3	2	0	1	0	6
June	1	1	0	2	2	0	2	1
July	2	1	0	1	0	0	2	3
August . . .	1	0	1	1	1	1	2	1
September . .	1	2	0	0	2	4	1	2
October . . .	0	0	0	0	1	0	0	1
November . .	0	2	1	2	0	1	1	3
December . .	0	0	1	0	0	2	0	0
Total . . .	10	14	8	12	10	15	12	22

Showing the number of times that CIRRO-CUMULUS *clouds prevailed at the hours of observation.*

Month.	0^h.	3^h.	6^h.	9^h.	Noon.	3^h.	6^h.	9^h.
1875.								
January . . .	8	5	7	9	15	18	8	7
February . . .	9	10	8	12	15	12	10	9
March. . . .	10	13	11	9	14	20	14	9
April	12	11	8	16	20	14	17	11
May	15	7	10	13	20	22	17	11
June	15	17	16	18	25	23	21	14
July	16	22	21	22	26	25	25	9
August . . .	13	11	12	21	23	23	15	10
September . .	15	14	14	16	21	18	15	10
October . . .	8	6	8	17	21	24	15	13
November . .	14	11	10	11	15	14	10	6
December . .	8	10	8	9	10	13	8	8
Total . . .	143	137	133	173	219	226	175	117

TABLE VII—Continued.

Showing the number of times that CIRRO-STRATUS *clouds prevailed at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.								
January . . .	0	1	4	2	0	0	4	0
February. . .	0	0	0	1	1	1	2	1
March . . .	0	0	0	0	1	1	1	1
April	1	0	0	1	0	1	0	0
May	1	0	2	0	0	0	2	2
June	0	0	0	2	0	1	0	1
July	3	0	0	0	0	0	0	2
August . . .	0	1	2	0	0	0	2	0
September . .	0	0	1	0	0	0	1	0
October . . .	0	2	4	0	0	0	5	0
November . .	0	2	1	2	1	0	2	1
December . .	1	1	0	1	2	1	2	0
Total . . .	6	7	14	9	5	5	21	8

Showing the number of times that CUMULUS *clouds prevailed at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.								
January . . .	9	10	9	9	6	3	7	8
February. . .	2	4	4	0	0	1	0	2
March . . .	6	7	6	4	6	2	2	8
April	5	4	4	3	4	3	2	4
May	2	0	1	2	2	1	1	1
June	2	2	2	0	0	2	0	3
July	3	4	2	1	0	2	0	4
August . . .	5	5	7	5	4	3	4	7
September . .	0	0	1	3	1	2	0	1
October . . .	4	5	4	0	2	0	1	1
November . .	5	5	3	0	3	4	7	6
December . .	6	7	6	3	4	1	5	11
Total . . .	49	53	49	30	32	24	29	56

Showing the number of times that CUMULO-STRATUS *clouds prevailed at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.								
January . . .	0	0	0	0	0	1	3	0
February. . .	1	0	1	0	2	1	4	0
March . . .	3	0	0	0	1	0	5	0
April	1	1	2	0	0	1	3	0
May	0	0	0	0	0	0	1	0
June	0	0	0	0	0	0	0	0
July	1	1	2	0	0	0	2	3
August . . .	0	0	0	0	0	0	0	2
September . .	0	1	2	0	0	1	5	0
October . . .	3	1	4	0	0	0	5	1
November . .	0	0	1	1	3	4	4	0
December . .	0	1	2	1	2	1	0	0
Total . . .	9	5	14	2	8	9	32	6

Showing the number of times that STRATUS *clouds prevailed at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.								
January . . .	0	0	1	0	0	1	2	0
February . .	0	0	1	0	0	2	2	0
March . . .	0	0	2	0	0	0	1	1
April	0	0	1	0	1	0	1	0
May	0	0	0	1	0	0	0	0
June	0	0	1	0	0	0	0	0
July	0	0	1	0	0	0	0	0
August . . .	0	1	0	0	0	0	0	0
September . .	1	0	0	0	0	0	1	1
October . . .	1	0	2	0	0	0	0	0
November . .	0	0	0	0	0	0	0	2
December . .	0	0	1	1	0	0	2	0
Total . . .	2	1	10	2	1	3	9	4

Showing the number of times that NIMBUS *clouds prevailed at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.								
January . . .	5	3	4	5	6	5	3	6
February. . .	4	4	6	7	5	5	3	2
March . . .	4	6	7	9	6	5	4	4
April	5	4	4	3	1	5	3	3
May	2	4	2	1	0	1	2	0
June	4	1	0	1	2	2	4	1
July. . . .	0	1	1	4	3	3	1	4
August . . .	7	6	7	4	3	4	6	4
September . .	1	4	3	1	0	3	2	2
October . . .	1	2	2	2	1	1	0	1
November . .	3	3	8	7	4	3	0	2
December . .	5	4	6	7	7	7	7	2
Total . . .	41	42	50	51	38	44	35	31

Showing the number of times that HAZE *prevailed at the hours of observation.*

Month.	0^{h}.	3^{h}.	6^{h}.	9^{h}.	Noon.	3^{h}.	6^{h}.	9^{h}.
1875.								
January . . .	2	1	0	2	1	0	0	0
February. . .	0	0	0	2	1	1	1	2
March . . .	4	1	3	1	0	1	1	4
April	1	2	4	1	0	1	0	2
May	3	5	6	6	6	5	3	4
June	2	3	6	3	1	1	0	1
July	4	0	3	2	2	1	1	5
August . . .	0	1	0	0	0	0	0	0
September . .	0	1	3	1	1	0	0	0
October . . .	6	6	2	5	1	1	0	4
November . .	2	1	0	3	1	0	0	2
December . .	5	3	2	7	5	4	3	6
Total . . .	29	24	29	33	19	15	9	30

METEORS.

1875.

METEORS OBSERVED IN 1875.

Want of assistance prevented systematic observations of meteors during the year, though arrangements were made to observe the August and November showers, and a record was made of all observations of sporadic meteors.

AUGUST SHOWER.

August 5.6, sky clear; observer, D. Horigan.

From 13^{h} 30^{m} to 14^{h} 0^{m} one observer counted	29 meteors.
From 14^{h} 0^{m} to 14^{h} 30^{m} one observer counted	33 meteors.
From 14^{h} 30^{m} to 15^{h} 0^{m} one observer counted	22 meteors.
From 15^{h} 0^{m} to 15^{h} 30^{m} one observer counted	28 meteors.
Total	112 meteors.

These meteors were nearly all small, but some of them left trains of short duration. The radiant point was in Perseus, and many of the meteors moved toward Polaris.

The morning of November 13–14 was cloudy, and no meteors were seen on the 12th or 15th.

The following list contains all the miscellaneous meteors whose paths were carefully observed in 1875:

Date.	Mean Time.	Observer.	Magnitude.	Color.	Duration.	Appearance and duration of train.	Length of path.	Course of meteor.
1875.	h. m. s.				s.		°	
July 9	9 45	Horigan	Bright as Mars	White and orange	3.5	Continuous train.	15	Started about 5° above Mars and fell vertically, passing 8° west of Mars; separated into two parts, each of which moved 5° before extinction.
14	9 10	Horigan	Large as Mars	Orange and red.	4.0	Continuous train.	12	Started from a point 10° above Mars, and fell vertically about 5° east of Mars.
Aug. 5	11 15	Eastman	2d magnitude.	Orange.	2.0	Slight train	15	From λ Sagittarii toward λ Scorpii.
Sept. 16	7 36	Todd. .	Three times the size of Venus.	White	3.0	Slight train	18	From Saturn to λ Aquarii; finally exploded, causing quite an illumination of the small cloud behind which it passed.
Oct. 17	7 15	. . . .	1st magnitude.	White and green	2.0	Train visible 20^{s}.	25	Appeared near β Aquarii; fell vertically toward the horizon.
Nov. 14	13 14	Todd. .	Size of Mars.	White	2.0	No train. .	32	From Cassiopeæ nearly vertically toward the horizon.
17	7 11	Horigan	3d magnitude.	White	1.0	Short train.	10	Fell perpendicularly from Polaris.
	7 28 49	Todd. .	1st magnitude.	White	0.7	No train. .	.	Vertically down from ζ Ceti.
	7 28 50	Todd. .	1st magnitude.	White	0.7	No train. .	.	Nearly vertically down from χ Ceti.
	7 28 51	Todd. .	1st magnitude.	White	0.7	No train. .	.	Vertically down from χ Ceti. All disappeared at 5° from horizon.
22	8 0	Holden.	8′ to 12′ . . .	Violet or pink in front, bright green in center, pale green following.	6 to 8	Pale greenish train.	.	Moved vertically through ε Cygni nearly through β Cygni; within 6° or 8° of the horizon it passed behind a bank of clouds.

END OF METEOROLOGICAL OBSERVATIONS FOR 1875.

WASHINGTON OBSERVATIONS FOR 1875—APPENDIX I.

REPORT

ON

THE DIFFERENCE OF LONGITUDE

BETWEEN

THE U. S. NAVAL OBSERVATORY

AND

THE SAYRE OBSERVATORY

OF

LEHIGH UNIVERSITY.

BY

J. R. EASTMAN,
PROFESSOR OF MATHEMATICS, UNITED STATES NAVY.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1878.

UNITED STATES NAVAL OBSERVATORY,
Washington, D. C., October 1, 1878.

SIR: In October, 1875, a series of clock signals were exchanged between this observatory and the observatory of Lehigh University, at Bethlehem, Pa., to determine the longitude of the latter point. This work was undertaken at the request of Professor C. L. Doolittle, of Lehigh University, who made the observations and the computations for the station at Bethlehem.

The observations and computations at the United States Naval Observatory were made by the observers attached to the Transit Circle. For a description of this instrument, together with the methods of making and reducing observations, the reader is referred to the "Introduction" to the work of the Transit Circle in the "Washington Observations," 1875. It may be noted here, however, that the Azimuth, Level, and Collimation constants were assumed to be unchanged during the time occupied in making the observations on each night; and that the adopted clock-corrections and rates were obtained from the corrections from all the objects observed, except circumpolar stars, by the method of least squares.

The following table shows the observations and reductions as made at the United States Naval Observatory.

In the third column, E. indicates Professor J. R. Eastman, F. Assistant E. Frisby, and P. Assistant H. M. Paul.

Observations with the Transit Circle at the United States Naval Observatory.

Date.	Star.	Observer.	Number of threads.	Mean thread.	*Aa*	*Bb*	*Cc*	Instrument'l corrections.	Corrected Transit.	Adopted Right Ascen.	Observed clock-corr.
				h. m. s.	s.	s.	s.	s.	s.	s.	s.
1875. Oct. 20	ω Piscium . . .	P.	9	23 53 0.18	− 0.77	− 0.08	+ 0.01	− 0.84	59.34	56.91	− 2.43
	α Andromedæ .	P.	9	0 2 1.76	0.29	0.10	0.01	0.38	1.38	58.96	.42
	γ Pegasi . . .	P.	9	0 6 54.47	− 0.61	0.08	0.01	− 0.68	53.79	51.31	.48
	Polaris . . .	P.	7	1 13 1.85	+45.98	2.47	0.42	+43.93	45.78	43.36	. .
	ο Piscium . . .	P.	9	1 38 54.48	− 0.73	0.08	0.01	− 0.80	53.68	51.22	.46
	β Arietis . . .	P.	9	1 47 50.89	0.48	0.09	0.01	0.56	50.33	47.85	.48
	α Arietis . . .	P.	9	2 0 14.39	− 0.43	− 0.09	+ 0.01	0.51	13.88	11.45	.43
21	κ Aquilæ . . .	F.	7	19 30 15.94	− 1.00	− 0.11	+ 0.05	− 1.06	14.88	12.22	2.66
	γ Aquilæ . . .	F.	8	40 24.34	0.67	0.14	0.05	0.76	23.58	20.97	.61
	α Aquilæ . . .	F.	9	44 46.53	− 0.70	0.14	0.05	− 0.79	45.74	43.11	.63
	λ Ursæ Minoris .	F.	8	47 21.40	+56.44	5.53	2.68	+53.59	14.99	13.07	. .
	α Andromedæ .	F.	9	0 2 2.03	− 0.28	0.18	0.06	− 0.40	1.63	58.96	.67
	γ Pegasi . . .	F.	9	6 54.60	0.58	0.15	0.05	0.68	53.92	51.31	.61
	β Ceti	F.	5	37 26.52	− 1.22	0.09	0.05	− 1.26	25.26	22.55	.71
	Polaris . . .	F.	5	1 13 4.00	+44.36	− 4.38	+ 2.12	+42.10	46.10	43.27	. .

Observations with the Transit Circle at the United States Naval Observatory—Continued.

Date.	Star.	Observer.	Number of threads.	Mean thread.	*Aa*	*Bb*	*Cc*	Instrument'l corrections.	Corrected Transit.	Adopted Right Ascen.	Observed clock-corr.
				h. m. s.	s.	s.	s.	s.	s.	s.	s.
1875. Oct. 25	λ Aquarii . . .	E.	9	22 46 12.22	-- 0.94	— 0.10	+ 0.02	— 1.02	11.20	8.77	— 2.43
	θ Piscium . . .	E.	9	23 21 44.09	0.70	0.13	0.02	0.81	43.28	40.83	.45
	ι Piscium . . .	E.	9	33 37.73	0.71	0.12	0.02	0.81	36.92	34.57	.35
	ω Piscium . . .	E.	9	23 53 0.11	0.69	0.13	0.02	0.80	59.31	56.89	.42
	α Andromedæ .	E.	9	0 2 1.72	0.26	0.17	0.02	0.41	1.31	58.95	.36
	γ Pegasi . . .	E.	9	6 54.39	0.54	0.14	0.02	0.66	53.73	51.30	.43
	β Ceti	E.	9	37 26.16	1.13	0.03	0.02	1.19	25.97	22.55	.42
	ε Piscium . . .	E.	9	0 56 34.10	— 0 67	0.13	0.02	— 0.78	33.32	30.92	.40
	Polaris . . .	E.	5	1 13 7.10	+41.14	4.11	0.85	+37.88	44.98	42.61	. .
	θ¹ Ceti	E.	9	17 53.60	— 0.95	0.10	0.02	— 1.03	52.57	50.15	.42
	η Piscium . . .	E.	9	1 24 54.39	— 0.54	— 0.14	+ 0.02	— 0.66	53.73	51.34	.39
Nov. 4	ε Piscium . . .	F.	9	0 56 35.51	-- 0.72	-- 0.04	+ 0.01	— 0.75	34.76	30.92	— 3.84
	Polaris . . .	F.	5	1 13 2.00	+44.05	1.37	0.42	+43.10	45.10	41.21	. .
	θ¹ Ceti	F.	9	1 17 54.98	— 1.02	0.03	0.01	— 1.04	53.94	50.17	.77
	η Piscium . . .	F.	9	1 24 55.71	— 0.58	0.05	0.01	0.62	55.09	51.37	.72
	ο Piscium . . .	F.	9	1 38 55.73	0.70	0.04	0.01	0.73	55.00	51.31	.69
	β Arietis . . .	F.	9	1 47 52.20	0.47	0.05	0.01	0.51	51.69	47.96	.73
	α Arietis . . .	F.	9	2 0 15.72	— 0.41	— 0.05	+ 0.01	— 0.45	15.27	11.58	.69
5	λ Aquarii . . .	P.	9	22 46 13.62	— 1.08	0.00	-- 0.02	— 1.10	12.52	8.66	— 3.86
	α Piscis Australis	P.	9	22 50 53.41	1.58	0.00	0.02	1.60	51.81	48.05	.76
	α Pegasi . . .	P.	9	22 58 39.43	0.62	0.00	0.02	0.64	38.79	34.97	.82
	θ Piscium . . .	P.	9	23 21 45.37	0.80	0.00	0.02	0.82	44.55	40.75	.80
	ι Piscium . . .	P.	9	23 33 39.10	— 0.82	0.00	0.02	— 0.84	38.26	34.49	.77
	Polaris . . .	P.	9	1 12 58.00	+47.27	+ 0.13	0.85	+46.55	44.55	40.85	. .
	ο Piscium . . .	P.	9	1 38 55.91	— 0.75	0.00	0.02	— 0.77	55.14	51.31	.83
	β Arietis . . .	P.	9	1 47 52.27	0.50	0.00	0.02	0.52	51.75	47.96	.79
	α Arietis . . .	P.	9	2 0 15.81	— 0.44	0.00	— 0.02	— 0.46	15.35	11.58	.77

The constants employed in the preceding reductions are given in the following table:

	a	*b*	*c*
	s.	s.	s.
Oct. 20.4	— 1.35	— 0.09	+ 0.01
21.3	— 1.33	— 0.16	+ 0.05
25.4	— 1.20	— 0.15	+ 0.02
Nov. 4.4	— 1.37	— 0.05	+ 0.01
5.4	— 1.47	+ 0.004	— 0.02

PERSONAL EQUATION.

The corrections for personal equation, both for the observers at Washington and at Bethlehem, were obtained from observations with the Personal Equation Apparatus at the United States Naval Observatory. For a description of this apparatus, and the method of observing, the reader is referred to the Introduction to the Observations with the Transit Circle, Washington Observations, 1875, or to the paper at the end of the separate copies of this Appendix.

Each observer at Washington, with one exception, obtained the value of his personal equation during the time he was making the observations for time. The observer on November 4 observed for personal equation on the morning of November 5.

Professor Doolittle made his observations for personal equation at the Naval Observatory on January 5 and 7, 1876, by the eye-and-ear method.

The results from each set of observations with the apparatus and the adopted mean of the several sets are given below, together with the sign with which the correction is to be applied to the observed time.

Date.	Observer.	Thread Interval	Sets.						Mean.
			I.	II.	III.	IV.	V.	VI.	
1875.		s.	s.	s.	s.	s.	s.	s.	
Oct. 20	Paul .	2.2	− 0.010	0.023	0.032	0.033	0.020	. .	− 0.024
21	Frisby .	2.2	− 0.080	.090	.098	.065	.087	. .	− 0.084
25	Eastman	2.2	− 0.187	.234	.227	.218	.230	. .	− 0.219
Nov. 4	Frisby .	2.2	− 0.083	.052	.041	.085	.064	. .	− 0.065
5	Paul .	2.2	− 0.040	.016	.011	.024	.031	. .	− 0.024
1876.									
Jan. 5	Doolittle	15.0	+ 0.110	.215	.265	.135	.130	.100	+ 0.159
7	Doolittle	15.0	+ 0.125	.080	.150	.080	.000	.080	+ 0.086 10^{h} a. m.
7	Doolittle	15.0	+ 0.045	.180	.185	.080	.215	.100	+ 0.134 2^{h} 30^{m} p. m.

The deduced clock-corrections and rates are given in the following table:

Date.	Hour.	Observed clock-corr.	Correction for personal equation.	Adopted clock-corr.	Hourly rate.
1875.	s.	s.	s.	s.	s.
Oct. 20	0.91	− 2.450	+ 0.024	− 2.426	− 0.0071
21	21.95	− 2.648	+ 0.084	− 2.564	− 0.0063
25	0.00	− 2.412	+ 0.219	− 2.193	+ 0.0064
Nov. 4	1.50	− 3.742	+ 0.065	− 3.677	+ 0.1331
5	0.00	− 3.800	+ 0.024	− 3.776	+ 0.0044

The original plan for exchanging signals was as follows:

WASHINGTON TO BETHLEHEM.

Send seconds signals from the sidereal clock to the Bethlehem station until two or more coincidences are obtained with the Bethlehem mean-time chronometer.

BETHLEHEM TO WASHINGTON.

Send three sets of signals of thirteen signals in each set, the intervals in each set being respectively 5^s, 1^s, and 10^s. The signals to be sent with the ordinary message-key by breaking the main line in coincidence with the beat of the mean-time chronometer.

The following description of the Observatory at Bethlehem, the instruments used in the work, and the methods of determining the clock-corrections and exchanging signals at Bethlehem, was prepared by Prof. C. L. Doolittle. Professor Doolittle also furnished the accompanying observations for time, and the necessary computations for determining the clock-corrections at his station.

DESCRIPTION OF OBSERVATORY AND INSTRUMENTS AT SOUTH BETHLEHEM, TOGETHER WITH THE METHODS OF REDUCTION AND THE EXCHANGE OF SIGNALS.

The Sayre Observatory is situated near the west side of the grounds of the Lehigh University, near the town of South Bethlehem, Pa. The building is of brick, and consists of a central part and two wings of the usual form. In the westerly wing are the instruments, with which the longitude observations were made. These instruments are as follows:

I. A portable transit by Stackpole & Brother. The focal length is 26 inches; axis, 16 inches; aperture, 2 inches. The observations were all made with a diagonal eye-piece, magnifying 40 diameters. The reticule contains five threads, the intervals of which from the mean thread, determined from observations of forty stars of various declinations, are as follows:

$$\left.\begin{array}{r} \text{I} + 32^{s}.744 \\ \text{II} + 16\ .314 \\ \text{III} + \ \ 0\ .152 \\ \text{IV} - 16\ .446 \\ \text{V} - 32\ .737 \end{array}\right\} \text{Lamp east.}$$

These were only required in reducing imperfect transits, the mean of the observed times being used in other cases.

A series of level-readings for determining the inequality of pivots gave a result but little larger than the probable error of the determination. It was therefore not used.

The field is illuminated by an oil-lamp placed at one end of the axis.

The instrument is firmly mounted on a brick pier, the foundation of which is several feet below the surface of the ground. The value of one division of the striding level is $0^s.300$.

II. A sidereal clock, by William Bond & Son. No. 368.

III. A mean-time chronometer; also by Bond.

The transits were observed by the eye and ear method, a common telegraphic "sounder" being used for the purpose.

None but Nautical Almanac stars were used, the apparent places being taken from that publication. The stars observed were divided into groups of six or seven. Each group contained, as far as possible, two equatorial stars, two zenith stars, and two circumpolar stars, one at upper and one at lower culmination. The instrument was reversed after each series.

The clock correction and rate, the azimuth and collimation, were determined from all the observations of the evening by the method of least squares. The clock correction and rate used are in all cases those which result from the solution of the equations, giving equal weights to all.

In exchanging the signals with Washington, the mean-time chronometer was used, being carried back and forth between the observatory and the telegraph office in the Union Railroad Dépôt, distant about one-third of a mile. The chronometer was first compared with the clock by coincidence of beats. The chronometer was then carried to the telegraph office and the signals exchanged, when it was compared a second time with the clock. A series of transits was always observed both before and after the exchange of signals.

The signals were sent from Bethlehem by the telegraph operator, Mr. Clewel, using the ordinary telegraph apparatus. The circuit was kept closed with the make-circuit key, and broken in coincidence with the beats of the chronometer at the proper intervals. While this was going on, I watched carefully the beats of the sounder, and marked for rejection those signals which did not coincide with the chronometer beat. At the same time, I noticed a marked personal equation between Mr. Clewel and myself in estimating the instant of the chronometer beat. This difference seemed very constant, and I estimated its amount at the time at from $0^s.1$ to $0^s.05$. A mean value of $0^s.075$ was adopted. This is to be added to the time of signals sent to Washington.

The signals sent from Washington by means of the sidereal clock were received by observing the coincidence of beats with the mean-time chronometer in the usual way.

My personal equation, as determined by the use of the instrument at the Washington Observatory, was $0^s.126$; the transit observed too soon.

The transit instrument is 19 feet west of the centre of the dome of this observatory, making a difference of longitude of $0^s.016$.

Observations for Clock-correction at Bethlehem.

Date.	Object.	Lamp.	Seconds of transit over threads.					Mean of times.	*Bb*	*N*	*v*
			I.	II.	III.	IV.	V.				
1875.								h. m. s.	s.	s.	s.
Oct. 20	κ Aquilæ	W.	10.8	54.2	38.0	21.1	5.0	19 29 37.82	+ .04	− .33	− .12
	γ Aquilæ	W.	19.9	3.0	46.8	30.0	13.6	19 39 46.66	+ .09	− .21	− .01
	ε Draconis	W.	34.6	47.0	59.2	11.8	24.3	19 47 59.42	+ .40	− .23	+ .16
	3 Ursæ Majoris, S. P.	E.	22.0	36.6	51.9	6.0	21.0	19 59 51.50	− .08	− .78	− .07
	κ Cephei	E.	59.5	13.7	27.0	42.8	56.5	20 12 27.90	+ .31	+1.09	− .02
	π Capricorni	E.	4.1	22.0	38.6	56.2	13.3	20 19 38.84	+ .05	+ .24	+ .09
	ε Delphini	E.	9.8	26.4	42.8	59.8	15.9	20 26 42.94	+ .08	+ .39	+ .13
	α Cygni	E.	51.8	14.9	37.8	1.0	23.8	20 36 37.86	+ .12	+ .31	+ .02
	ν Cygni	W.	41.1	19.3	58.1	36.8	15.1	20 51 58.08	+ .19	− .19	+ .07
	σ^2 Ursæ Majoris, S. P.	W.	26.8	9.6	52.5	35.7	18.8	20 58 52.68	− .12	+ .37	+ .06
	ζ Cygni	W.	42.2	23.0	5.0	45.9	27.1	21 7 4.64	+ .17	− .23	+ .02
	α Cephei	W.	11.3	36.5	2.3	27.1	52.7	21 15 1.98	+ .30	− .52	− .15
	β Aquarii	W.	0.2	43.3	27.4	11.0	55.1	21 24 27.40	+ .11	− .01	+ .26
	11 Cephei	E.	53.2	42.7	31.3	21.4	11.1	21 39 31.94	+ .33	+ .31	− .37
	μ Capricorni	E.	24.5	40.9	58.2	15.2	31.8	21 45 58.12	+ .07	+ .26	+ .03
	α Aquarii	E.	18.1	34.5	50.8	7.2	23.5	21 58 50.82	+ .09	+ .20	+ .09
	θ Aquarii	E.	10.4	27.1	43.2	0.1	16.8	22 9 43.52	+ .07	+ .27	+ .18
	9 Draconis, S. P.	E.	10.5	1.4	52.8	43.6	35.5	22 23 52.76	− .20	−1.51	− .35
	ζ Pegasi	W.	15.1	58.6	42.3	25.8	9.0	22 34 42.16	+ .10	− .27	+ .02
	λ Aquarii	W.	7.3	50.8	34.6	18.0	1.5	22 45 34.44	+ .08	− .22	+ .10
	α Ursæ Majoris, S. P.	W.	17.0	53.2	28.1	3.0	38.0	22 55 27.86	− .07	− .03	− .22
	ο Cephei	W.	22.2	39.9	58.0	15.4	33.0	23 12 57.70	+ .35	− .82	− .33
	θ Piscium	W.	39.1	22.5	6.8	50.1	33.7	23 21 6.44	+ .13	− .23	+ .09
	ι Cassiopeæ	W.	41.3	59.3	18.2	36.8	55.5	2 18 18.21	+ .24	− .51	+ .08
	γ Ceti	W.	51.1	35.0	18.8	2.1	45.9	2 36 18.58	+ .09	− .36	+ .07
	α Ceti	W.	46.8	30.0	14.0	57.9	41.0	2 55 13.94	+ .10	− .26	+ .18
	ζ Arietis	W.	47.1	29.7	12.8	54.9	37.0	3 7 12.30	+ .13	− .39	+ .05
	α Persei	W.	44.0	19.0	54.2	28.9	4.1	3 14 54.04	+ .21	− .63	− .14
	δ Persei	E.	44.1	8.2	32.5	56.1	. .	3 34 32.31	+ .16	+ .25	− .17
	ζ Persei	E.	8.0	27.0	46.3	5.5	24.8	3 45 46.32	+ .10	− .13	− .11
	γ Eridani	E.	7.3	24.4	41.7	58.0	14.4	3 51 41.16	+ .05	+ .05	+ .15
	Groom. 2320, S. P.	E.	49.5	5.9	22.4	37.8	55.0	4 5 22.12	− .06	− .98	− .02
	ε Tauri	E.	14.0	31.3	48.5	5.8	23.0	4 20 48.52	+ .06	− .14	− .07
	α Tauri	E.	40.0	57.4	14.2	31.0	48.2	4 28 14.16	+ .05	− .29	− .21
	9 Camelopardalis	E.	49.4	30.6	10.3	50.8	31.0	4 41 10.42	+ .08	+ .20	− .10

Normal Equations.

$$\delta t = +\ .104 \pm .0296$$

$$+61.869\,a - 26.986\,c - 9.224\,\chi + 15.077\,\delta t = +11.246 \qquad \chi = +\ .0334$$

$$-26.986\,a + 135.639\,c + 11.581\,\chi - 5.876\,\delta t = -29.175 \qquad c = -\ .1939$$

$$-9.224\,a + 11.581\,c + 352.170\,\chi - 17.900\,\delta t = +7.026 \qquad a = +\ .076$$

$$+15.077\,a - 5.876\,c - 17.900\,\chi + 35.000\,\delta t = +5.330 \qquad \Delta' T = 34.00$$

$$\Delta T = \Delta' T + \delta t = 34.104 \pm .0296$$

Observations for Clock-correction at Bethlehem.

Date.	Object.	Lamp.	Seconds of transit over threads.					Mean of times.	B	N	v
			I.	II.	III.	IV.	V.				
1875.								h. m. s.	s.	s.	s.
Oct. 21	κ Aquilæ	E.	4.8	21.5	37.4	54.0	10.5	19 29 37.64	.00	− .04	− .05
	γ Aquilæ	E.	13.2	30.0	46.2	3.0	19.5	19 39 46.38	.00	− .07	− .10
	ε Draconis	E.	25.0	12.8	59.9	47.3	34.5	19 47 59.90	+ .01	+ .41	+ .06
	3 Ursæ Majoris, S. P. .	E.	20.5	35.0	50.8	5.6	20.0	19 59 50.38	.00	−1.40	− .40
	κ Cephei	E.	59.0	13.3	27.0	42.1	55.5	20 12 27.38	+ .02	+ .89	− .18
	π Capricorni . . .	E.	3.6	21.0	38.1	55.9	12.9	20 19 38.30	.00	+ .16	+ .18
	ε Delphini	E.	9.0	25.9	42.1	58.8	15.0	20 26 42.16	.00	+ .04	+ .0
	α Cygni	E.	51.2	14.5	37.0	0.0	22.8	20 21 37.10	+ .01	− .03	− .16
	ν Cygni	W.	40.6	18.9	57.8	36.0	14.6	20 51 57.58	+ .04	− .32	+ .16
	α Ursæ Majoris, S. P. .	W.	26.4	9.5	51.0	34.8	17.3	20 58 51.80	− .03	+ .01	− .13
	ζ Cygni	W.	41.8	23.0	4.1	45.2	26.7	21 6 4.16	+ .05	− .31	+ .16
	α Cephei	W.	11.0	35.6	1.4	26.5	51.9	21 15 1.28	+ .11	− .86	− .26
	β Aquarii	W.	59.8	42.9	26.8	9.9	5 .0	21 24 26.68	+ .05	− .28	+ .22
	11 Cephei	E.	. .	42.5	31.3	21.0	10.5	21 39 31.50	+ .16	+ .26	− .31
	μ Capricorni . . .	E.	23.6	40.8	57.2	14.7	31.0	21 45 57.46	+ .02	+ .06	+ .15
	α Aquarii	E.	17.6	33.9	50.0	6.8	22.8	21 58 50.22	.00	+ .03	+ .11
	θ Aquaril	E.	10.0	26.5	42.8	59.3	15.8	22 9 42.88	− .02	+ .05	+ .15
	9 Draconis, S. P. . .	E.	9.7	0.0	52.8	42.5	33.6	22 23 51.72	+ .10	−1.83	− .31
	ζ Pegasi	W.	14.9	58.0	41.9	25.0	8.8	22 34 41.72	.00	− .30	+ .23
	λ Aquarii	W.	6.3	50.0	34.1	17.4	1.0	22 45 33.76	.00	− .46	+ .10
	α Ursæ Majoris, S. P. .	W.	. .	52.5	26.7	2.4	. .	22 55 27.20	.00	− .17	− .17
	ο Cephei	W.	22.0	39.8	57.5	14.8	33.0	23 12 57.42	.00	− .94	− .20
	θ Piscium	W.	38.6	22.1	6.1	49.5	33.0	23 21 5.86	.00	− .43	+ .14
	ε Piscium	W.	28.9	12.1	56.0	39.4	23.0	0 55 55.88	− .01	− .52	+ .11
	θ Ceti	W.	48.0	31.3	15.1	58.4	42.1	1 17 14.98	.00	− .63	+ .02
	η Piscium	W.	50.0	33.0	16.1	59.5	42.6	1 24 16.24	+ .02	− .49	+ .15
	ο Piscium	W.	49.0	32.3	16.0	59.8	43.2	1 38 16.06	+ .03	− .67	− .01
	50 Cassiopeæ . . .	W.	3.3	10.1	19.1	26.0	34.4	1 52 18.58	+ .15	− .75	+ .19
	α Draconis, S. P. . .	W.	8.0	47.2	25.2	4.0	42.2	2 0 25.32	− .04	+ .06	+ .16
	ι Cassiopeæ . . .	E.	56.1	37.3	18.9	0.5	1.5	2 18 18.86	+ .02	+ .40	+ .16
	5 Ursæ Minoris, S. P. .	E.	26.4	17.5	9.5	0.5	52.0	2 27 9.18	+ .04	−1.64	+ .04
	γ Ceti	E.	46.0	2.4	18.5	34.9	50.9	2 36 18.54	− .04	− .03	+ .24
	α Ceti	E.	41.1	57.5	13.8	30.4	46.3	2 55 13.82	− .06	− .06	+ .22
	ζ Arietis	E.	37.1	54.5	12.4	29.6	47.0	3 7 12.12	− .11	− .33	− .08
	α Persei	E.	4.1	29.4	53.8	19.2	44.2	3 14 54.14	− .21	− .47	− .37

Normal Equations.

$$
\begin{aligned}
+76.601\,a - 35.674\,c - 7.842\,\chi + 17.891\,\delta t &= +20.263 \\
-35.674\,a + 153.205\,c - 11.336\,\chi + 3.631\,\delta t &= -35.737 \\
-7.842\,a - 11.336\,c + 252.920\,\chi - 35.200\,\delta t &= +\ .702 \\
+17.891\,a + 3.631\,c - 35.200\,\chi + 35.000\,\delta t &= +10.660
\end{aligned}
$$

$$
\begin{aligned}
\delta t &= +.3201 \pm .0394 \\
\chi &= +.0405 \\
c &= -.2162 \\
a &= +.0932 \\
\Delta' T &= +34^{s}.50 \\
\Delta T = \Delta' T + \delta t &= 34.820 \pm .0394
\end{aligned}
$$

Observations for Clock-correction at Bethlehem.

Date.	Object.	Lamp.	Seconds of transit over threads.					Mean of times.	*Bb*	*N*	*v*
			I.	II.	III.	IV.	V.				
1875.								h. m. s.	s.	s.	s.
Oct. 25	γ Aquilæ	E.	11.0	27.7	44.1	0.8	17.1	19 39 44.14	− .04	+ .02	+ .12
	ε Draconis	E.	21.5	9.9	56.5	44.4	32.3	19 47 56.92	− .17	− .17	+ .23
	3 Ursæ Majoris, S. P.	E.	19.5	34.8	50.0	4.8	19.5	19 59 49.72	+ .08	− .00	− .12
	κ Cephei	E.	55.2	9.0	22.5	39.0	52.7	20 12 23.68	− .42	− .51	+ .13
	π Capricorni . . .	E.	1.1	18.6	35.8	52.8	10.5	20 19 35.76	− .07	− .08	− .00
	ε Delphini	E.	7.0	23.7	40.1	56.8	13.1	20 26 40.14	− .14	+ .25	+ .37
	α Cygni	E.	48.9	12.0	34.4	57.6	20.6	20 36 34.70	− .26	− .30	− .10
	ν Cygni	W.	39.0	17.0	56.0	34.0	12.2	20 51 55.64	− .22	− .13	− .15
	σ^2 Ursæ Majoris, S. P.	W.	23.8	6.0	49.0	32.5	14.5	20 58 49.16	+ .11	− .47	− .36
	ζ Cygni	W.	39.7	21.0	2.6	43.5	25.0	20 7 2.36	− .13	+ .08	+ .08
	α Cephei	W.	9.5	34.5	0.0	25.0	50.8	21 14 59.96	− .17	+ .01	− .00
	β Aquarii	W.	57.5	41.0	25.0	8.2	52.1	21 24 24.76	− .04	+ .08	+ .04
	11 Cephei	E.	48.8	39.2	28.0	18.3	7.5	21 39 28.36	− .33	− .85	− .38
	μ Capricorni . . .	E.	21.3	38.3	55.0	12.0	28.9	21 45 55.10	− .09	− .05	+ .08
	α Aquarii	E.	15.2	31.9	48.2	4.5	20.5	21 58 48.06	− .14	+ .07	+ .22
	θ Aquarii	E.	7.4	24.1	40.5	57.0	13.5	22 9 40.50	− .14	− .10	+ .05
	*9 Draconis, S. P. . .	E.	8.9	59.0	51.3	42.0	. .	22 23 50.62	+ .45	− .63	− .85
	ζ Pegasi	W.	13.0	56.5	40.0	23.4	7.0	22 34 39.98	− .16	+ .13	+ .15
	λ Aquarii	W.	5.2	48.8	32.3	15.5	59.2	22 45 32.20	− .11	+ .20	+ .20
	α Ursæ Majoris, S. P.	W.	14.2	49.3	24.8	0.5	35.3	22 55 24.82	+ .07	− .35	− .19
	ο Cephei	W.	20.6	38.2	55.7	13.6	30.3	23 12 55.68	− .30	− .56	− .52
	θ Piscium	W.	36.8	20.7	4.5	47.8	31.2	23 21 4.20	− .09	+ .14	+ .18
	θ Ceti	W.	46.4	30.0	13.8	57.0	40.3	1 17 13.50	− .07	+ .10	+ .18
	η Piscium	W.	48.5	31.7	15.0	57.8	41.0	1 24 14.80	− .11	+ .22	+ .32
	ο Piscium	W.	47.5	31.0	14.4	58.1	41.9	1 38 14.58	− .11	− .02	+ .08
	50 Cassiopeæ . . .	W.	2.1	9.1	17.5	25.4	32.6	1 52 17.34	− .36	− .26	− .16
	α Draconis, S. P. . .	W.	5.5	44.3	21.3	0.5	39.0	2 0 22.12	+ .09	− .71	− .45
	ι Cassiopeæ . . .	E.	52.3	35.0	15.9	58.1	39.0	2 18 16.06	− .47	− .68	− .14
	5 Ursæ Minoris, S. P.	E.	26.0	16.5	8.0	0.0	52.0	2 27 8.50	+ .40	+ .45	+ .08
	γ Ceti	E.	43.7	0.0	16.4	32.8	49.0	2 36 16.38	− .17	− .08	+ .21
	α Ceti	E.	. .	55.4	11.5	27.8	44.2	2 55 11.52	− .18	− .24	+ .06
	ζ Arietis	E.	35.0	52.8	10.2	27.4	45.0	2 7 10.08	− .24	− .27	+ .06
	α Persei	E.	2.0	27.0	51.9	17.2	42.3	3 14 52.08	− .37	− .49	− .10

* Rejected by Peirce's criterion.

Normal Equations.

$$\begin{aligned}
+75.732\,a - 35.869\,c - 4.998\,\chi + 16.588\,\delta t &= -\ .562 \\
-35.869\,a + 151.173\,c - 27.091\,\chi + 3.630\,\delta t &= +10.184 \\
-4.998\,a - 27.091\,c + 231.710\,\chi - 31.300\,\delta t &= -\ 1.581 \\
+16.588\,a + 3.630\,c - 31.300\,\chi + 33.000\,\delta t &= +\ 5.200
\end{aligned}$$

$$\begin{aligned}
\delta t &= +.1801 \pm .0458 \\
\chi &= +.0294 \\
c &= +.0808 \\
a &= -.0760 \\
\Delta' T &= 36.80 \\
\Delta T = \Delta' T + \delta t &= 36.9801 \pm .0458
\end{aligned}$$

$$\begin{aligned}
+61.459\,a - 19.854\,c + 1.043\,\chi + 12.810\,\delta t &= -\ 3.941 \\
-19.854\,a + 133.204\,c - 33.873\,\chi + 7.869\,\delta t &= +12.855 \\
+1.043\,a - 33.873\,c + 229.150\,\chi - 29.700\,\delta t &= -\ 1.480 \\
+12.810\,a + 7.869\,c - 29.700\,\chi + 32.000\,\delta t &= +\ 4.570
\end{aligned}$$

Observations for Clock-correction at Bethlehem.

Date.	Object.	Lamp.	Seconds of transit over threads.					Mean of times.	*Bb*	*N*	
			I.	II.	III.	IV.	V.				
								h. m. s.	s.	s.	s.
1875. Nov. 4	π Capricorni . . .	E.	57.3	14.9	32.0	49.0	6.1	20 19 31.86	+ .07	− .00	+ .17
	ε Delphini	E.	2.8	19.1	35.8	52.7	9.0	20 26 35.88	+ .10	+ .08	+ .24
	α Cygni	E.	44.7	8.0	30.3	53.7	16.3	20 36 30.60	+ .14	− .04	+ .16
	ν Cygni	E.	8.2	30.0	51.1	13.0	34.3	20 51 51.32	+ .11	− .19	+ .01
	σ^2 Ursæ Majoris, S. P. .	E.	12.5	30.0	47.2	4.3	21.0	20 58 47.00	− .06	+ .18	− .10
	ζ Cygni	E.	20.1	39.4	58.0	17.1	35.7	20 6 58.06	+ .06	− .15	+ .03
	α Cephei	E.	45.4	20.1	55.0	30.1	4.1	20 14 54.94	+ .07	− .65	− .36
	β Aquarii	E.	48.0	4.3	20.2	37.0	53.6	21 24 20.62	+ .02	− .18	− .01
	11 Cephei	W.	3.4	13.5	24.8	35.0	46.4	21 39 24.62	+ .03	+ .08	− 26
	μ Capricorni . . .	W.	25.0	8.0	51.2	34.7	18.0	21 45 51.38	+ .02	+ .17	+ .09
	α Aquarii	W.	16.7	0.0	44.5	28.0	11.1	21 58 44.06	+ .04	+ .09	+ .02
	θ Aquarii	W.	9.8	53.2	37.0	20.0	4.0	22 9 36.80	+ .05	+ .21	+ .14
	9 Draconis, S. P. . .	W.	30.0	39.6	48.0	57.6	6.0	22 23 48.25	− .19	− .88	− .28
	ζ Pegasi	E.	2.7	19.0	35.9	52.9	9.0	22 34 35.90	+ .10	+ .12	+ .30
	λ Aquarii	E.	55.0	11.8	28.0	44.9	1.0	22 45 28.14	+ .07	+ .12	+ .31
	α Ursæ Majoris, S. P. .	E.	32.8	57.0	22.7	47.0	12.1	22 55 22.32	− .03	+ .28	+ .08
	ο Cephei	E.	26.8	9.0	50.8	34.0	16.0	22 12 51.32	+ .11	− .47	− .09
	θ Piscium	E.	27.1	43.9	0.0	16.5	32.8	23 20 0.06	+ .02	− .12	+ .07
	γ Cephei	W.	0.5	48.2	37.0	24.3	. .	23 33 36.27	+ .23	+ .31	− .19
	ω Piscium	W.	49.0	32.8	16.7	0.0	43.5	23 52 16.40	+ .06	+ .12	+ .07
	4 Draconis, S. P. . .	W.	57.4	18.8	38.5	59.3	19.3	0 5 38.66	− .20	− .92	− .21
	α Cassiopeæ . . .	W.	46.4	17.0	48.2	19.0	50.1	0 32 48.14	+ .16	− .31	− .46
	β Ceti	W.	16.7	59.0	42.0	24.5	7.8	0 36 42.00	+ .05	+ .07	+ .02
	ι Cassiopeæ . . .	W.	35.5	54.2	13.0	. . .	. .	2 18 12.54	+ .22	+ .04	− .18
	5 Ursæ Minoris, S. P. .	W.	46.8	55.7	3.5	12.8	20.6	2 27 3.88	− .19	− .98	− .33
	γ Ceti	W.	45.1	29.0	12.6	56.2	40.1	2 36 12.60	+ .08	− .01	− .03
	α Ceti	W.	40.8	24.4	8.0	51.8	35.1	2 54 8.02	+ .08	+ .10	+ .08
	ζ Arietis	W.	41.4	23.6	6.9	49.2	32.0	3 7 6.62	+ .10	+ .16	+ .14
	α Persei	W.	38.6	13.4	48.2	23.2	58.3	3 14 48.34	+ .15	− .22	− .30
	δ Persei	E.	37.6	1.8	25.7	50.0	14.0	3 33 25.82	+ .13	− .14	+ .16
	η Tauri	E.	51.0	9.0	26.6	44.5	2.0	3 39 26.62	+ .08	− .19	+ .06
	ζ Persei	E.	1.6	21.0	40.0	59.1	18.2	3 45 39.98	+ .07	− .33	.07
	γ Eridani	E.	1.1	18.0	34.9	51.5	8.4	3 51 34.78	+ .03	− .12	+ .13
	Groom, 2320, S. P. .	E.	44.0	0.2	16.8	32.4	49.0	3 5 16.48	− .03	+ .35	+ .15
	ε Tauri	E.	8.0	25.2	42.3	59.9	17.0	4 20 42.48	+ .02	− .06	+ .20
	α Tauri	E.	33.8	51.0	8.4	25.1	42.0	4 28 8.06	+ .01	− .27	− .01
	9 Camelopardalis . .	E.	43.5	23.3	4.1	45.2	25.0	4 41 4.22	− .00	− .35	+ .08

Normal Equations.

$$\delta t = +.0706 \pm .0359$$

$$+85.823\,a + 48.893\,c + 2.677\,\chi + 21.415\,\delta t = +8.170 \qquad \chi = +.0124$$

$$+48.893\,a + 164.729\,c + 1.921\,\chi + 8.482\,\delta t = +21.375 \qquad c = +.1240$$

$$+2.677\,a + 1.921\,c + 288.340\,\chi + 10.000\,\delta t = +4.535 \qquad a = +.006$$

$$+21.415\,a + 8.482\,c + 10.000\,\chi + 37.000\,\delta t = +4.100 \qquad \triangle' T = +40.50$$

$$\triangle T = \triangle' T + \delta t = 40.571 \pm .0359$$

Observations for Clock-correction at Bethlehem.

Date.	Object.	Lamp.	Seconds of transit over threads.					Mean of times.	*Bb*	*N*	*v*
			I.	II.	III.	IV.	V.				
1875.								h. m. s.	s.	s.	s.
Nov. 5	κ Cephei	E.	49.4	4.0	17.6	32.1	46.0	20 12 17.82	+ .27	— .30	+ .25
	ε Delphini	E.	2.0	18.8	35.4	52.0	8.4	20 26 35.32	+ .05	— .02	+ .17
	α Cygni	E.	. .	7.0	29.9	53.0	16.1	20 36 29.96	+ .07	— .22	+ .01
	ν Cygni	E.	8.0	29.6	51.0	12.5	34.0	20 51 51.02	+ .05	— .03	+ .18
	σ^2 Ursæ Majoris, S. P.	E.	. .	29.0	47.4	3.2	20.4	20 58 46.51	— .02	+ .15	+ .05
	ζ Cygni	E.	20.0	39.0	57.4	16.6	35.0	21 6 57.60	+ .02	— .13	+ .08
	α Cephei	W.	4.6	29.7	55.1	20.4	45.5	21 14 55.06	— .00	— .06	— .24
	β Aquarii	W.	53.2	36.9	20.7	4.0	47.8	21 24 20.52	— .00	+ .21	+ .18
	11 Cephei	W.	3.4	13.0	24.3	34.3	45.2	21 39 24.04	+ .03	+ .06	— .22
	μ Capricorni . . .	W.	24.7	7.8	51.0	34.0	17.2	21 45 50.94	+ .01	+ .23	+ .20
	α Aquarii	W.	16.2	0.0	43.6	27.4	10.9	21 58 43.62	+ .02	+ .12	+ .09
	θ Aquarii	W.	9.3	52.9	36.4	20.0	. .	22 9 36.38	+ .02	+ .27	+ .25
	9 Draconis, S. P. . .	W.	29.6	38.5	47.0	56.6	6.2	22 23 47.58	— .09	—1.05	— .43
	ζ Pegasi	E.	2.0	18.7	35.0	52.0	8.1	22 34 35.16	+ .03	— .18	+ .03
	λ Aquarii	E.	54.6	11.2	27.4	44.1	0.5	22 45 27.56	+ .02	— .00	+ .22
	α Ursæ Majoris, S. P.	E.	32.4	56.5	21.5	46.0	11.5	22 55 21.58	— .01	+ .02	— .11
	o Cephei	E.	25.5	8.6	50.2	33.0	15.0	23 12 50.46	+ .04	— .86	— .48
	θ Piscium	E.	26.6	43.4	59.8	16.0	32.4	23 20 59.64	+ .01	— .04	+ .18
	γ Cephei	W.	0.3	47.2	35.7	23.5	11.0	23 33 35.54	+ .11	+ .02	— .42
	ω Piscium	W.	48.6	32.1	15.9	59.5	43.0	23 52 15.82	+ .04	+ .03	+ .03
	4 Draconis, S. P. . .	W.	56.6	18.1	37.3	58.6	19.1	0 5 37.94	— .11	—1.13	— .40
	α Cassiopeæ . . .	W.	45.3	16.4	48.2	19.0	50.2	0 32 47.82	+ .18	— .10	— .20
	β Ceti	W.	16.0	59.0	41.4	24.2	7.1	0 36 41.54	+ .07	+ .13	+ .13
	ι Cassiopeæ . . .	W.	35.0	53.1	12.7	31.1	50.0	2 18 12.38	+ .15	+ .30	+ .13
	5 Ursæ Minoris, S. P.	W.	46.4	55.3	3.5	12.6	21.0	2 27 3.76	— .14	— .55	+ .11
	γ Ceti	W.	45.0	28.4	12.2	56.0	39.8	2 36 12.28	+ .06	+ .14	+ .27
	α Ceti	W.	40.0	23.9	7.4	51.0	34.8	2 55 7.42	+ .07	— .02	+ .01
	ζ Arietis	W.	40.9	23.2	6.0	48.5	31.0	3 7 5.92	+ .10	— .05	— .03
	α Persei	W.	38.1	12.8	47.9	23.0	58.0	3 14 47.96	+ .17	— .10	— .14
	δ Persei	E.	36.9	1.0	25.1	49.2	13.1	3 33 25.06	+ .16	— .39	— .07
	η Tauri	E.	50.4	8.4	26.0	43.9	2.0	3 39 26.14	+ .10	— .17	+ .10
	ζ Persei	E.	1.2	20.9	39.9	59.0	17.5	3 45 39.70	+ .10	— .10	+ .18
	γ Eridani	E.	0.8	17.6	34.1	51.0	7.7	3 51 34.24	+ .04	— .17	+ .11
	Groom. 2320, S. P. .	E.	43.5	59.4	16.5	32.1	48.0	4 5 15.90	— .06	+ .26	+ .13
	ε Tauri	E.	7.2	24.5	41.9	59.0	16.1	4 20 41.74	+ .06	— .28	— .00
	α Tauri	E.	33.8	51.0	7.1	24.4	41.5	4 28 7.56	+ .05	— .25	+ .03
	9 Camelopardalis . .	E.	42.5	23.5	3.7	44.0	23.6	4 41 3.46	+ .08	— .55	— .12

Normal Equations.

$$\begin{array}{llll}
 & & & \delta t = +.1059 \pm .0369 \\
+92.452\,a + 37.333\,c + 16.476\,\chi + 17.783\,\delta t = 7.452 & & & \chi = +.0110 \\
+37.333\,a + 184.441\,c + 5.895\,\chi + 5.714\,\delta t = 22.449 & & & c = +.1151 \\
+16.476\,a + 5.895\,c + 288.230\,\chi + 10.100\,\delta t = 5.070 & & & a = +.0118 \\
+17.783\,a + 5.714\,c + 10.100\,\chi + 37.000\,\delta t = 4.810 & & & \Delta' T = 41.000 \\
 & & & \Delta T = \Delta' T + \delta t = 41^{s}.106 \pm .0369
\end{array}$$

Therefore the clock corrections and rates are as in the following table:

Date.	Sidereal hour.	Observed clock-corr.	Personal equation.	Clock-corr.	Hourly rate.
1875.	h.	s.	s.	s.	s.
Oct. 20	0.0	+ 34.104	− 0.126	+ 33.978	+ 0.033
21	0.0	34.820	0.126	34.694	0.041
25	0.0	36.980	0.126	36.854	0.029
Nov. 4	0.0	40.571	0.126	40.445	0.012
5	0.0	41.106	0.126	40.980	0.011

Comparisons of Clock and Chronometer.

The time given in each case is the mean of three coincidences, except on November 5, when only two were obtained.

Date.	Clock.	Correction.	Chronometer.	Correction.	Hourly rate.
1875.	h. m. s.	s.	h. m. s.	m. s.	s.
Oct. 20	23 32 0.00	+ 33.96	9 27 45.00	+ 8 15.47	
	1 51 50.67	+ 34.04	11 47 12.67	+ 8 15.64	+ 0.073
21	23 31 11.00	+ 34.67	9 23 7.50	+ 8 8.89	
	1 0 34.00	+ 34.74	10 52 15.50	+ 8 9.32	+ 0.289
25	23 33 43.33	+ 36.84	9 9 59.33	+ 8 7.51	
	1 7 28.33	+ 36.89	10 43 28.83	+ 8 7.70	+ 0.122
Nov. 4	0 4 55.00	+ 40.45	9 1 54.67	+ 8 3.23	
	2 10 2.67	+ 40.47	11 6 41.50	+ 8 3.59	+ 0.173
5	0 16 16.00	+ 40.98	9 9 18.00	+ 8 3.66	
	1 59 32.50	+ 41.00	10 52 17.25	+ 8 4.01	+ 0.204

Bethlehem Chronometer Corrections and Rates.

Date.	Chronometer time.	Correction.	Rate.
1875.	h. m. s.	m. s.	s.
Oct. 20	9 27 45.0	+ 8 15.47	+ 0.073
21	9 23 7.5	8 8.89	+ 0.289
25	9 9 59.3	8 7.51	+ 0.122
Nov. 4	9 1 54.7	8 3.23	+ 0.173
5	9 9 18.0	8 3.66	+ 0.204

EXCHANGE OF SIGNALS.

BETHLEHEM TO WASHINGTON.

Date.	Number of signals.	Bethlehem M. T. chronometer.	Washington sidereal clock.	Washington mean time.
1875.		h. m. s.	h. m. s.	h. m. s.
Oct. 20	20	10 45 18.40	0 43 42.63	
		Corr., + 8 15.56	Corr., – 2.43	
		10 53 33.96	0 43 40.20 =	10 46 53.96
21	30	9 55 24.06	23 57 29.94	
		Corr., + 8 9.05	Corr., – 2.58	
		10 3 33.11	23 57 27.36 =	9 56 52.78
25	66	9 57 17.73	0 15 8.66	
		Corr., + 8 7.61	Corr., – 2.19	
		10 5 25.34	0 15 6.47 =	9 58 45.36
Nov. 4	39	10 8 22.18	1 5 37.32	
		Corr., + 8 3.42	Corr., – 3.73	
		10 16 25.60	1 5 33.59 =	10 9 45.11
5	22	10 10 27.96	1 11 40.76	
		Corr., + 8 3.87	Corr., – 3.77	
		10 18 31.83	1 11 36.99 =	10 11 51.62

EXCHANGE OF SIGNALS.

WASHINGTON TO BETHLEHEM.

The times given are the means of a number of coincidences indicated in each case by the small subscript figures following the Bethlehem times.

Date.	Bethlehem M, T. chronometer.	Washington sidereal clock.	Washington mean time.
1875.	h. m. s	h. m. s.	h. m. s.
Oct. 20	11 7 43.	1 6 10.75	
	Corr., + 8 15.59	Corr., – 2.43	
	11 15 58.59	1 6 8.32	11 9 18.40
21	10 15 10.33_3	0 17 19.33	
	Corr., + 8 9.14	Corr., – 2.58	
	10 23 19.47	0 17 16.75	10 16 38.92
25	10 9 35.17_3	0 27 27.67	
	Corr., + 8 7.63	Corr., – 2.19	
	10 17 42.80	0 27 25.48	10 11 2.35
Nov. 4	10 33 33.75_4	1 30 53.00	
	Corr., + 8 3.49	Corr., – 3.68	
	10 41 37.24	1 30 49.32	10 34 56.71
5	10 21 42.17_3	1 22 56.68	
	Corr., + 8 3.91	Corr., – 3.77	
	10 29 46.08	1 22 52.91	10 23 5.69

Comparison of Signals.

Date.	Direction of signals.	Station.	Mean time.			Difference of longitude—		Wave and Armature time.
						W. to B.	B. to W.	
			h.	m.	s.	m. s.	m. s.	s.
1875. Oct. 20	W. to B.	W.	11	9	18.40			0.095
		B.	11	15	58.59	6 40.19		
	B. to W.	W.	10	46	53.96			
		B.	10	53	33.96		6 40.00	
21	W. to B.	W.	10	16	38.92			0.110
		B.	10	23	19.47	6 40.55		
	B. to W.	W.	9	56	52.78			
		B.	10	3	33.11		6 40.33	
25	W. to B.	W.	10	11	2.35			0.235
		B.	10	17	42.80	6 40.45		
	B. to W.	W.	9	58	45.36			
		B.	10	5	25.34		6 39.98	
Nov. 4	W. to B.	W.	10	34	56.71			0.020
		B.	10	41	37.24	6 40.53		
	B. to W.	W.	10	9	45.11			
		B.	10	16	25.60		6 40.49	
5	W. to B.	W.	10	23	5.69			0.090
		B.	10	29	46.08	6 40.39		
	B. to W.	W.	10	11	51.62			
		B.	10	18	31.83		6 40.21	
Mean .	. .	.	.	.	. .	6 40.422	6 40.202	0.110
						6 40.312		

The Transit of the Sayre Observatory is $0^{s}.016$ west of the center of the dome. The Transit Circle of the United States Naval Observatory is $0^{s}.066$ west of the center of the central dome of the Observatory.

The correction to the longitude deduced by Professor Doolittle for the constant error of the telegraph operator at Bethlehem in sending signals is $-0^{s}.075$.

Applying these corrections to the above value of the longitude, we have the center of the dome of the Sayre Observatory

$$6^{m}\ 40^{s}.19$$

east of the center of the dome of the United States Naval Observatory.

From an inspection of the table showing a comparison of signals it will be evident that the chief cause of discrepancies between the results on the different nights lies in the uncertainty of the signals sent by the operator at Bethlehem from Bethlehem to Washington.

Mr. M. Marean conducted the work with the telegraph-lines at this observatory with his usual skill and courtesy.

Very respectfully,

J. R. EASTMAN,
Professor Mathematics, United States Navy.

Rear-Admiral JOHN RODGERS,
Superintendent U. S. Naval Observatory.

APPENDIX II.

RESEARCHES

ON THE

MOTION OF THE MOON.

MADE AT THE

UNITED STATES NAVAL OBSERVATORY, WASHINGTON,

BY

SIMON NEWCOMB,

PROFESSOR, U. S. NAVY.

PART I.

REDUCTION AND DISCUSSION OF OBSERVATIONS OF THE MOON BEFORE 1750.

PREFACE.

For several years after the publication of **Hansen**'s Tables of the Moon, it was very generally believed that the theory of the motion of that body, after having been the subject of astronomical and mathematical research for two thousand years, was at last complete, and that, in consequence, the motion of the moon could now be predicted with the same accuracy as that of the other heavenly bodies. In 1870, the writer showed that this belief was entirely unfounded, and that the correctness of the tables since 1750 had been secured only by sacrificing the agreement with observations previous to that epoch, so that, about 1700, **Hansen**'s Tables deviated more widely from observations than did those which they superseded. It was also shown that at the time of writing, the moon was falling behind the tabular position at a rate which would speedily cause a very serious error in the representation of the Tables. Altogether, it appeared that notwithstanding the immense improvement which **Hansen** had made in the accuracy of the inequalities of short period, the theory of those of long period was no nearer such a solution as would agree with observation than when it was left by **Laplace**.

The work of reinvestigating the subject, and, if possible, of ascertaining the cause of these deviations, was soon after, with the concurrence of Rear-Admiral **Sands**, made a part of the author's official duty at the Naval Observatory. It may be proper to remark that this arrangement was largely due to the interest taken in the subject by Captain (now Rear-Admiral) **Daniel Ammen**, U. S. Navy, the Chief of the Bureau of Navigation.

The work as planned was divisible into two distinct parts:—

1. The mathematical theory of the inequalities of long period in the moon's mean motion. As the only cause to which such inequalities could be attributed was the action of the planets, this part of the investigation resolved itself into a computation of that action.

2. The study of the inequalities in question from observations, especially from observations before 1750. In the ancient and modern observations of eclipses and occultations, there was believed to be an immense mass of valuable material for the purpose in question, some of which had been almost forgotten, and very little of which had been discussed with modern data.

An amount sufficient for the employment of two computers having been appropriated by Congress, these two investigations were carried on simultaneously, with the intention of completing them in the order in which they have been named. But as the mathematical investigation was supposed to be nearly brought to a close, it was found that certain terms, which were at first supposed to be of no importance, would have to be investigated, and that this investigation might prove the most tedious part of the whole work, unless some method of shortening it could be devised. Not having yet been able to decide which is the best method of treating the subject, the investigation is still incomplete, and the present research, originally intended as Part II, is issued as Part I.

In 1871, advantage was taken of a journey in Europe to ascertain whether the older observatories and libraries of that continent might not contain unpublished observations of eclipses or occultations which would be of value for the subject in hand. In this, an unexpected measure of success was attained. At Paris, M. Delaunay, then the Director of the Observatory, placed all the archives of that establishment unreservedly at my disposal. Among this material were most of the original note-books of the French astronomers from 1675 onward, and here a great number of occultations were found to have been observed, though the observations had been totally forgotten. The observations published in the Memoirs of the Academy were but a small fraction of those actually observed, and that fraction was composed of the least valuable of them.

One circumstance connected with these observations, while greatly increasing the labor of the reduction, has also increased the value of the results by insuring the entire genuineness of the records. The records made use of consisted, in large part, of the original rough notes of the observations, without any explanation whatever, and without any reductions except the occasional application of a supposed clock-correction. In perhaps half the cases, the star occulted was neither named nor described, while the methods of determining clock-error had to be ascertained by comparison and induction. Many of the books were entirely anonymous. As the copies of the records of which use has been made are given in full in the present paper, a minute description is not here necessary.

At the observatory of Pulkowa, I was fortunate enough, through the kind offices of Director Struve, to find what might be considered as the complement of the Paris observations in the records of Delisle's observations at St. Petersburg between 1727 and 1747. From about 1720, there was a great falling-off in the number of the Paris observations, so that those of St. Petersburg come in very opportunely. At Pulkowa I also availed myself of the opportunity of making use of the unrivalled astronomical library of the establishment to complete the list of published data. In these researches at Pulkowa I was actively assisted by Dr. Lindemann, then acting librarian, who devoted several days to this work.

Another series of observations which, though published, seem to have been nearly forgotten, was found in the *Livre de la Grande Table Hakémite*, translated from an Arabian manuscript by Caussin. These comprise the most valuable of the Arabian observations, but, so far as I am aware, they have not before been fully compared with modern tables.

The want of accurate data in the beginning has added greatly to the labor of completing the present work, and caused much unavoidable delay. In the case of many of the Paris observations, the stars could not be identified until the times of observation had been computed, and the apparent place of the moon at those times found from the tables. Then the star had to be observed, in order to improve the means of determining its proper motion. The existing data for determining the places of stars two centuries back were so insufficient that a complete reinvestigation of the right ascensions of the stars became a necessary part of the work. This investigation was rendered successful by AUWERS's re-reduction of BRADLEY's observations; and its results have in part been published.

It will be seen that the material most used in the present investigation has hitherto been least known. Possibly, the most valuable portion of it is found in the unpublished Paris observations, whereby the moon's mean longitude is determined with astronomical accuracy from 1680 onward. The observations of GASSENDUS, HEVELIUS, and FLAMSTEED (whereby the mean longitude is carried back with gradually diminishing accuracy a half century farther), though published, have never been used for determining the moon's place. Nearly the same remark will apply to the Arabian observations, though it was by them that the secular acceleration of the moon's mean motion was first determined. On the other hand, the ancient total eclipses of the sun, which have been so much discussed during the present century, are here thrown aside. The reason for this course being given in the proper place need not be repeated now; nor will the writer make any attempt to forestall the differences of opinion which may arise respecting its validity. He will only remark that he approached the subject without any bias whatever, unless a general distrust of the scientific precision of ancient authors may be regarded as a bias, and that the various considerations which presented themselves to his mind on examining these records are here reproduced as exactly as possible. While the result of the examination of ancient solar eclipses has seemed to him to justify his general distrust, that of the lunar eclipses in the *Almagest* has not. Moreover, no part of the discussion has been altered in the light of the result finally reached; but, verbal revision aside, each consideration is given as it was originally written. The only approach to an exception occurs in § 2, from which he has expunged a derogatory estimate of PTOLEMY's eclipses, formed before he had compared them with the tables. The lack of unity and consistency which may thus have arisen in a discussion which has been growing by piecemeal for six years may be excused under these circumstances.

The date 1750 is fixed upon as the terminal point of the investigation, partly because it is that when accurate meridian observations commence, and also because it is the epoch which separates the period within which we have readily accessible observations and copious tables of reduction founded on modern data, from that during which both these requirements are wanting.

In conclusion, the author wishes to place on record his appreciation of the labors of the skilled assistants, without whose help the completion of the work would not have been possible. He owes much to the conscientious accuracy of his young friend, Mr. PARKER PHILLIPS, who, with Mr. JOHN T. HEDRICK, assisted him from 1871 until 1873. In the closing parts of the work, most of the necessary computations were prepared by Mr. JOHN MEIER and Mr. W. F. McK. RITTER. His engagements rendering it difficult to read the proof-sheets properly, Mr. D. P. TODD has taken an active part in passing the work through the press.

NAUTICAL ALMANAC OFFICE,
Washington, April, 1878.

ERRATA.

Page 13, line 5, for Bd. 60 read Bd. 52.
Page 42, Ecl. No. 10, for $5^h\ 56^m$ read $6^h\ 56^m$.
Page 44, line 19, for $+ 18'$ read $- 18'$.
Page 59, line 21, for $L_0 - 111°$ read $L_0 + 111°$.
Page 60, lines 4 and 5, add (7).
Page 74, lines 13 and 15, for π read Π.
Page 84, line 8 from bottom, for $90\frac{1}{2}$ read $99\frac{1}{2}$.
Page 205, line 1, add § 12.
Page 231, line 8 from bottom, for $3.8''$ read $38''$.

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RESEARCHES

ON THE

MOTION OF THE MOON.

PART I.

DISCUSSION OF OBSERVATIONS MADE PREVIOUS TO THE YEAR 1750.

§ 1.

HISTORICAL INTRODUCTION.

In all theories of the moon before the beginning of the last century, the mean motion of that body was supposed to be uniform. The first inequality discovered was the secular acceleration. While the general proposition that a comparison of ancient and modern eclipses shows the mean motion of the moon to have increased since the time of PTOLEMY is no doubt due to HALLEY, I believe the first careful determination of its amount is that by DUNTHORNE.* Going backward, in the order of time, he compares his tables of the moon† with the following eclipses:—

Those of TYCHO BRAHE in his *Progymnasmata;*
Those of WALTHER and REGIOMONTANUS (A. D. 1478–90);
Two of the Cairo eclipses (A. D. 977 and 978);
The eclipse of THEON (A. D. 364);
The eclipses of PTOLEMY.

The first of these series of eclipses was too near his epoch, and the second too unreliable, to predicate anything certain upon. From an examination of the others, he concludes that the observed times will be best satisfied by supposing a secular acceleration of 10″ in a century.

Soon afterward, TOBIAS MAYER deduced an acceleration of 7″ from the eclipses of the *Almagest*, which value he is said to have used in his earlier tables of the moon.

The subject is next discussed by LALANDE in the Memoirs of the French Academy of Sciences for the year 1757. Like BULLIALDUS and others of his countrymen, he has grave doubts of the honesty with which PTOLEMY has given the times of his eclipses, and therefore uses only the first of the series, that of −720. He adds the two eclipses observed at Cairo by Ebn JOUNIS, A. D. 977 and 978, and reported in the introduction to the *Historia Coelestis* of TYCHO BRAHE, and thence concludes that the secular acceleration is about 9″.886 per century.

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* *Phil. Trans.*, No. 492, p. 162.

† These tables were probably those published in 1739 (LALANDE, *Bibliographie Astronomique*, p. 410). I know of no copy of them in this country.

The next event in the history of the problem is the discovery by LAPLACE of the physical cause of the acceleration, and his calculation of its amount, which he fixed at very nearly 10″. The exact agreement of this result, and also that of PLANA, with those derived by DUNTHORNE and LALANDE from observations, seems to have satisfied the next two generations of astronomers that no more exhaustive discussion of the ancient eclipses was necessary. We find an acceleration scarcely differing from 10″ adopted in all the Lunar Tables between those of LALANDE and HANSEN. I am not aware of any investigation having in view a definitive determination of the secular acceleration from observations alone during the century following LALANDE's paper. We have, it is true, two important papers by ZECH in a series of memoirs published at Leipsic under the general title

Preisschriften gekrönt und herausgegeben von der Fürstlich Jablonowskischen Gesellschaft zu Leipzig.

The two papers are:—

III. J. ZECH, *Astronomische Untersuchungen über die Mondfinsternisse des Almagest.* Leipzig, 1851.

IV. J. ZECH, *Astronomische Untersuchungen über die wichtigeren Finsternisse, welche von den Schriftstellern des classischen Alterthums erwähnt werden.* Leipzig, 1853.

The first of these papers has formed the basis of all the late discussions of PTOLEMY's eclipses; but the author finds these eclipses inadequate to give any determination of the moon's secular acceleration, a result which arises from his including the correction of the moon's mean motion, as well as of its secular acceleration, in his equations of condition. If we determine the mean motion, not from the modern observations alone, but from a comparison of the latter with those of PTOLEMY, it is evident that we shall have no accurate data remaining with which to determine the secular acceleration.

In 1853 appeared the celebrated paper of ADAMS, which showed that the theoretical value of the secular acceleration found by his predecessors needed a large diminution. This was followed by several accurate calculations of its amount by ADAMS himself and by DELAUNAY, the latter finally fixing it at 6″.176.* I conceive that no rational doubt can remain that this result represents the true effect of the gravitation of the planets within a small fraction of a second.

In constructing his Lunar Tables, HANSEN introduced the coefficient 12″.18, founded on a theoretical computation. A revision of his calculation, leading to a slightly greater result, namely, 12″.557, is given in his *Darlegung der theoretischen Berechnung der in den Mondtafeln angewandten Störungen* (ii, p. 374). About the time of publication of this work, HANSEN wrote that he had never disputed the correctness of the result of ADAMS and DELAUNAY, and defended his result rather on the ground of its representing ancient observations than on its theoretical correctness.* It can therefore scarcely be cited as tending to invalidate the results reached by these investigators.

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* *Comptes Rendus*, 1871, i, tome 72, p. 495.

It has long been recognized that there was no necessity for an agreement between the values of the acceleration derived from theory and from observation, because a retardation in the earth's motion of rotation would produce an apparent acceleration in the motion of the moon, and the friction of the tides must produce such a retardation. The original discovery of this principle is attributed to MAYER; but it would seem to have been lost sight of for nearly a century, when it was taken up again by FERREL, without any knowledge of MAYER's work. FERREL's first paper was published in 1853 in vol. iii of GOULD's *Astronomical Journal*. It contains the first known attempt to calculate from theory the retardation produced by the action of the moon on the tidal wave. Assuming that the tide caused by the moon in the open sea is two feet in height, and that it is highest two hours after the moon passes the meridian, he finds that, if the ocean covered the earth, the equatorial retardation of the latter would amount to 50 miles in a century. Deducting one fourth for the land surface, he finds the retarding effect of the moon alone to be 37.44 miles in a century, and the combined effects of the sun and moon to be 44.45 miles. If the earth were really retarded by this amount, an apparent secular acceleration of the moon amounting to 84″ in a century would be produced. As no such acceleration is observed except what is otherwise accounted for, he concludes that this effect of the sun and moon must be nearly balanced through the gradual contraction of the earth by loss of temperature.

After the researches of ADAMS and DELAUNAY, and the general concession of the correctness of their results, FERREL returned to the subject in a paper on *The Influence of the Tides in causing an Apparent Secular Acceleration of the Moon's Mean Motion*, read before the American Academy, December 13, 1864.† Reversing the process of his former paper, he finds that the unaccounted-for apparent secular acceleration of 6″ corresponds to a mean retardation of the tidal wave of 8 minutes, or to a retardation of 10 minutes if we suppose the earth to be cooling according to FOURIER's theory.

Two or three years after these papers by FERREL were published, but before they became known in Europe, DELAUNAY read a paper before the French Academy of Sciences on the same subject,—*Sur l'existence d'une cause nouvelle ayant une influence sensible sur la valeur de l'équation séculaire de la lune*.‡ Here the distinguished author demonstrates the retarding influence produced by the attraction of the moon on the tidal wave, following a course of reasoning similar to that of MAYER and of FERREL. It was through this paper that the subject was first brought prominently into notice and discussion.

Since in the action of the moon and the cooling of the earth we have two known causes which produce a secular variation in the mean day, the accurate effect of which cannot be computed deductively, it will probably not be disputed that the real result to be derived from observation is, not the acceleration of the moon's mean motion, but the retardation of the earth's rotation on its axis. Although the phenomenal effects of these two causes are nearly identical, they are not absolutely so. The longitudes of the sun and of the lunar perigee and nodes will, in fact, be affected by a secular inequality when expressed in terms of a variable unit of time. The effects of these apparent inequalities are, however, too minute to admit of detection by observation for a long time to come.

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* *Monthly Notices, R. A. S.*, vol. xxvi, p. 187. There is a short discussion of this subject by HANSEN in vol. xv of *Berichte der Königlich Sächsischen Gesellschaft der Wissenschaften zu Leipzig*, Leipzig, 1863, in which he discusses tidal retardation, and defends his coefficient on the grounds above indicated.

† *Proceedings of the American Academy of Arts and Sciences*, vol. vi, p. 379.

‡ *Comptes Rendus*, tome lxi, p. 1023, December 11, 1865.

From what has been said, it will be seen that the value of the secular acceleration adopted in HANSEN'S Lunar Tables can hardly be considered as having any sufficient *a priori* foundation. It was not determined from observation at all, but from theory; and the theory was so incomplete as to give a result double that which would have been given by a complete one. If, then, the result agrees with observation, it can only be because the effect of the omitted terms chances to be the same as that of the earth's tidal retardation. Whether they are the same is a question to be settled by observations, especially by those of ancient eclipses. The first of the recent discussions of ancient eclipses having this object in view was made by AIRY.

In the *Philosophical Transactions* for the year 1853, he has a paper *On the Eclipses of Agathocles, Thales, and Xerxes.* The feature of this paper of most interest at the present time is the historical discussion of the circumstances of each eclipse, more especially of the localities in which it was observed to be total. The computations are made from DE DAMOISEAU'S Lunar Tables, with the application of the corrections resulting from the Greenwich observations, and are, for the purpose in question, superseded by a subsequent paper. Shortly after the publication of HANSEN'S Lunar Tables, AIRY returned to the subject in a paper *On the Eclipse of Agathocles, the Eclipse at Larissa, and the Eclipse of Thales. With an Appendix on the Eclipse at Stiklastad,* in the *Memoirs of the Royal Astronomical Society,* vol. xxvi. Here he makes use of the places of the moon calculated by HANSEN from his tables, and of places of the sun from HANSEN'S Solar Tables. He considers the following conclusions fairly deducible from his investigation:—

1. The eclipse at Larissa, —556, May 19, is established as a real eclipse at a well-defined point, and may be adopted for critical reference in deciding on the value of lunar tables, as applicable to distant places of the moon.

2. Professor HANSEN'S Tables very well represent the phenomena of the three eclipses of AGATHOCLES, Larissa, and THALES, as far as we can interpret the historical accounts of these eclipses.

3. If any change is permitted in the two elements of secular acceleration of longitude, and change of the argument of latitude, it must be in the nature of increasing the acceleration, and increasing the argument of latitude in the distant ages.

The eclipse at Stiklastad is discussed in the addendum to this memoir. HANSEN'S Tables throw the limit of totality in the case of this eclipse about a hundred miles south of Stiklastad. To make the eclipses of Stiklastad and Larissa central, it is necessary to increase HANSEN'S secular acceleration by $0''.809$, and his argument of latitude by $49'' \times$ number of centuries preceding 1800. HANSEN'S sidereal acceleration being $12''.18$, this correction increases it to $12''.99$. The effect of these corrections is said to be to throw the shadow-tracks of the eclipses of AGATHOCLES andof THALES to the north, and nearer the points over which the historical evidence seems to indicate that they passed. In the opinion of the author, a strong presumption is thus produced in favor of their reality.

A comparison of Ptolemy's series of lunar eclipses, as discussed by Zech, with Hansen's Tables, has been made by Hartwig, and published in the *Astronomische Nachrichten*, Bd. 60. A clear tabular summary of his results is printed in the *Monthly Notices of the Royal Astronomical Society*, vol. xxvi, p. 185. The nineteen eclipses indicate a sensible negative correction to the secular acceleration, the mean being $-1''.9$. Only three out of the nineteen give the correction positive; and, if we regard the series as consisting of observations really independent, the probable error of this result cannot be more than $0''.4$, and its reality would therefore be beyond doubt. The result of these eclipses may therefore be regarded, from this point of view, as incompatible with that derived by Airy from eclipses of the sun; but the steps of the investigation are not given with sufficient fullness to enable us to judge of the reliableness of any conclusions which might be drawn from it.

It will be seen from the foregoing that the only approach to a definitive answer to the question the question what value, &c., what value of the secular acceleration is deducible from observations, is to be found in the papers of Professor Airy. If we accept the three most ancient eclipses which he has discussed as all undoubtedly total, then scarcely any deviation from Hansen's value of the secular acceleration seems admissible. But I cannot conceive that the historic evidence bearing on the subject places the phenomena of totality so far beyond doubt that a discussion of other data is unnecessary.

Such a discussion is the more necessary because it has been known, since the time of Laplace, that, in addition to the uniform acceleration of which we have spoken, the mean motion of the moon is apparently affected by inequalities of long period, in the satisfactory explanation of which geometers and astronomers have always found difficulty. The first discussion of such an inequality is, I believe, that of Laplace, in *Mécanique Céleste*, 2^{e} partie, livre vii, chap. v, under the title *Sur une inégalité à longue période, qui paroît exister dans le mouvement de la lune.* The discussion is mainly empirical, the existence and magnitude of the inequality being inferred from observations which showed that the mean motion of the moon during the second half of the eighteenth century was greater than during the first half. It was then assumed that the inequality was a periodic one, due to the fact that twice the motion of the moon's node, plus that of its perigee, is a very small quantity. The value of the coefficient concluded from the observations was $47''.51$, and the expression for the resulting inequality was

$$47''.51\ (=15''.39)\sin\left(2\,\text{☊}\,\text{☽}+\pi\,\text{☽}-3\,\pi\,\odot\right).$$

Using Hansen's notation for the lunar elements, namely, ω for the distance of the moon's perigee from its node, and ω' for the distance of the sun's perigee from the same node, the inequality would be

$$15''.39\sin(\omega-3\,\omega')=15''.39\sin\{173^\circ\,26'+(1^\circ\,57'.4)\,(t-1800)\}.$$

The following table shows how the observations on which the inequality was predicated were found by Laplace to be represented by it:—

Date.	Cor. to Lalande's Tables per Obs.	Corrections by the Formula.	Error outstanding.
	″	″	″
1691	− 13.58	− 11.48	+ 2.10
1756	0.00	+ 2.10	+ 2.10
1766	− 9.26	− 9.54	− 0.28
1779	− 28.09	− 32.93	− 4.84
1789	− 54.32	− 55.52	− 1.20
1801	− 87.96	− 85.86	+ 2.10

The tables compared with observation were those in the third edition of Lalande's *Traité d'Astronomie.* The complete formula for the correction of their mean longitude, as deduced from the comparisons in the second of the above columns, was

$$-39''.44 - 98''.654\, i + 47''.51 \sin(\varpi - 3\varpi');$$

i being the number of centuries after 1750.

It would seem that Laplace was by no means satisfied with this explanation of the cause of the inequality, as he afterward favored the hypothesis that it was due to an unequal compression of the southern and northern hemispheres of the earth. He found from theory that such an irregularity in the conformation of the earth would produce an inequality in the moon's mean motion depending on the same argument, except that the equinox would have to be substituted for the sun's perigee, and the function *cos* would have to be substituted for *sin.* But a careful analysis afterward showed him that this cause was inadequate, the inequality in question being insensible on any reasonably admissible supposition of the constitution of the terrestrial spheroid.*

The question was next taken up, from a theoretical standpoint, by Poisson, in his *Mémoire sur le mouvement de la lune autour de la terre,* in the *Mémoires de l'Académie des Sciences,* tome xiii, pp. 209–325. It occurred to this geometer that Airy's inequality of long period in the motion of the earth due to the action of Venus must involve a corresponding inequality of long period in the eccentricity of the earth's orbit, and must thus produce a corresponding inequality in the secular acceleration, and thence in the mean longitude of the moon; but the computation of the inequality showed it to amount to only two hundredths of a second. In his account of this memoir, published in the *Connaissance des Temps* for 1836, p. 61, Poisson remarks, "Il est facile de s'assurer que l'action directe des planètes sur la lune, ne saurait non plus donner lieu, dans le mouvement du satellite, à aucune inégalité de longue période." He shows that the coefficient of Laplace's first inequality is absolutely zero, at least so far as the terms of the lowest order are concerned. The hypothesis of an inequality in the length of the sidereal day he also considers entirely inadmissible. He hence concludes that no inequality of long period should be admitted in tables of the moon founded on theory. As to the existence of such an inequality, he thinks the observations are too uncertain to establish it.

**Connaissance des Temps,* 1823, p. 239.

It was reserved for HANSEN to show that an inequality of long period did really result from the theory of gravitation, and that it was due to the direct action of a planet.* He first computed LAPLACE's inequality, and, like POISSON, found that its coefficient was entirely insensible; but on developing certain terms in the action of Venus on the moon, which LAPLACE and POISSON had too hastily supposed to be insensible, he found the following inequality in the moon's mean longitude:—

$$\delta l = 16''.0 \sin(-g - 16g' + 18g'' + 35^\circ\ 20');$$

g, g', and g'' being the mean anomalies of the moon, the earth, and Venus respectively. As this expression still failed to account for the observed inequalities in the moon's mean longitude, he carried the approximation to terms of the fourth order with respect to the disturbing force, and found that the terms of the third and the fourth order increased the coefficient to 27''.4, while the argument remained unaltered; so that the concluded inequality became

$$27''.4 \sin(-g - 16g' + 18g'' + 35^\circ\ 20').$$

But, with this increase, the observations were hardly so well represented as before. The term depending on the argument of AIRY's equation of long period was then computed, and the coefficient found to be 23''.2. The term was

$$\delta l = 23''.2 \sin(8g'' - 13g' + 315^\circ\ 30').$$

The addition of this term to the other he considered would reconcile theory and observation. In the course of his paper, HANSEN remarks that he did not employ decimals enough in his computation to be able to pronounce with certainty upon the entire seconds of the coefficients: he therefore proposes to repeat the computation, using one or two more decimals.

The periods of these two inequalities are respectively 273 and 239 years. The difference of the periods is so small that, so far as the representation of existing observations is concerned, the two terms might have been combined into one.

HANSEN concludes his paper with an inquiry whether these two inequalities will satisfy the observations. He has before him the corrections to DE DAMOISEAU's theory given by the Greenwich observations from 1750 to 1830, and he finds that the residuals will be satisfied by applying, along with the above inequalities, the following corrections to the moon's mean longitude for 1800, and to its mean annual motion:—

Correction of epoch for 1800	— 5''.09
Correction of mean annual motion	+ 0''.4096.

He also makes a similar examination of the residuals in the chapter of the *Mécanique Céleste,* already referred to, and finds that these may be represented by applying to LALANDE's positions of the moon, along with the above inequality, the following corrections:—

Correction to mean longitude for 1764	— 24''.0
Correction to mean annual motion	— 0''.2377.

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Hansen makes no inquiry as to whether these two sets of corrections correspond to the difference between the moon's mean longitude and mean motion given in the two tables compared, and so lead to the same value of the lunar elements. It would not be difficult to answer this question, since both tables are extant, but the answer would be of little interest, owing to our ignorance of the star-places, equinox, or other data on which Laplace's observed longitudes rest. The writer cannot learn that any details of these laborious reductions of the observations of Flamsteed, La Hire, and others were ever published, and his efforts to find the original manuscript investigations, which were cordially seconded by the late lamented Delaunay, then director of the observatory of Paris, were fruitless. It is therefore probable that the whole investigation is lost to science.

This important paper is dated 1847, March 12. The next announcement from Hansen is seven years later, and appears, as a letter to the Astronomer Royal, in the *Monthly Notices of the Royal Astronomical Society* for November, 1854 (vol. xv, p. 8). He says:—

"The accurate determination of these two inequalities by theory, is the most difficult matter which presents itself in the theory of the moon's motion. I have on two occasions, and by different methods, sought to determine their values, but I have obtained results essentially different from each other. I am now again engaged with their theoretical determination by a method which I have simplified, and hope to bring the operation to a definitive close."

As two methods, that of "successive substitutions" and that of "undetermined coefficients", are described in his original paper of 1847, and the results of each given, it seems probable that these are the two methods referred to. If so, the first method gave 16″.0 for the coefficient of the first inequality and zero for that of the second, while the second gave 27″ for the first and 23″ for the second. We cannot decide whether the proposed computation with more decimals had or had not been executed.

Our next information is obtained from the completed tables of the moon published in 1857. Using mean anomalies, the expressions for these terms employed in the tables are

$$\begin{aligned} &15''.34 \sin(-g - 16g' + 18g'' + 33^\circ\, 36') \\ &+ 21''.47 \sin(8g'' - 13g' + 4^\circ\, 44'). \end{aligned}$$

The first of these terms is no doubt the result of the revised calculation described as in progress in the letter of 1854. But the second term is partially or wholly empirical, it being found necessary to alter the theoretical value to represent the observations of the moon from 1750 to 1850. What theoretical value Hansen actually found by his revised computation we do not know. His last and only explication of the matter is given in a letter to the Astronomer Royal dated 1861, February 2, a translation of which is found in the *Monthly Notices of the Royal Astronomical Society* for March, 1861 (vol. xxi, p. 153). He says:—

"For the rest, I have found the coefficient of 8V — 13E, by my last theoretical determination of it, by no means insensible, like Delaunay. Without the introduction of this coefficient, the observations show deviations at different epochs; but with the introduction of this, these deviations disappeared even to the last trace. I consider, therefore, its introduction as established, and reserve to myself a new theoretical determination of it, but cannot take this in hand until I shall have proceeded further in the calculation of the remaining coefficients. I have, besides, some other inequalities of long period, which are caused by the planets; but as the coefficients of these inequalities are small, I have neglected them in the tables, in order to avoid too great extension."

So far as the writer is aware, this is the last utterance of **Hansen** on this subject. In his *Darlegung*, published in 1865–66, we find no reference whatever to these terms.

Delaunay is the only other geometer who has attacked the problem of these inequalities. His researches are published with great fullness in the Additions to the *Connaissance des Temps* for 1862 and 1863. For the first approximation to the first inequality, his result is

$$16''.02 \sin(-g - 16g' + 18g'' + 35^\circ\ 20'.2),$$

a result almost exactly identical with that first given by **Hansen** in 1847. The ulterior approximations lead to the definitive value

$$16''.34 \sin(-g - 16g' + 18g'' + 35^\circ\ 16'.5),$$

a result one second greater than the definitive value adopted by **Hansen** in his tables.

In the case of the second inequality, he finds a coefficient of only 0''.27, a quantity quite insignificant in the present state of the question. We here find an irreconcilable difference on a purely theoretical question, on which no light has been thrown within the last fifteen years.

That the subject of the theoretical computation of the inequalities in the moon's mean motion produced by the action of the planets is by no means exhausted appears from the recent announcement by Mr. **Neison**, of England, that he has found an inequality of 16 years, due to the action of Jupiter. As this question involves that of the uniformity of the earth's rotation, it is one of those most worthy of the attention of geometers.

§ 2.

SUMMARY OF THE DATA NOW AT OUR DISPOSAL FOR DETERMINING THE APPARENT SECULAR ACCELERATION OF THE MOON FROM OBSERVATION ALONE.

It has long been tacitly assumed that we are dependent solely on the accounts of eclipses transmitted to us by history for the data necessary to prosecute the investigation in question. This view has undoubtedly been correct in times past. The effect of the cause sought increasing as the square of the time, the extreme roughness of the ancient observations has been more than counterbalanced by their remoteness. For instance, if the mean motion of the moon at the present epoch were accurately known, the secular acceleration could be determined equally well from an observation one century back, and from an observation twenty centuries back affected with an error four hundred times as great. As there must be a long series of modern observations to determine the mean motion itself, any error in which will affect the comparisons by which the secular acceleration is to be determined by an amount increasing as the simple time, a still farther advantage is thus given to the ancient observations. We may see this advantage in the strongest possible light by reflecting that, with a value of the secular acceleration one second in error, the motion of the moon during a period of two centuries might still be represented without an error of more than half a second.

Notwithstanding these disadvantages, I think the time has arrived when the observations made between the epoch of the invention of the telescope and the year 1750 are entitled at least to consideration as a means of determining the element in question. As a guide toward determining what observations are to be included in this discussion, and how they are to be used, it is proposed to give a brief summary of all the data at our disposal for determining positions of the moon before the year 1750, and to estimate the accuracy with which the secular acceleration can be found from each class or series of determinations, supposing the necessary favorable conditions to be fulfilled. Among these conditions must be included a theory of the inequalities of long period which shall accurately represent observations without any empirical correction, a desideratum which, as we have shown, astronomy does not yet possess. The observations will be divided into classes or series, each class or series presenting some common feature by which the data are to be judged. We begin with

I. *Statements of ancient historians from which it is inferred that the shadow of the moon passed over certain points of the earth's surface during certain total eclipses of the sun.*

If there were even a few cases in which this inference could be drawn without reasonable doubt, this class of observations would doubtless furnish us the most accurate data we possess for our present object. Considering only the eclipses at Larissa and Stiklastad, it appears, from the investigations of AIRY just described, that the limits of the value of the secular acceleration within which both eclipses will be total are very narrow, being only a small fraction of a second. But it seems to me that there is in nearly all these descriptions of phenomena too much vagueness to inspire us with entire confidence that any given eclipse was really total at the supposed point of observation. Reserving for the special discussion of each eclipse the difficulties which are peculiar to it, I shall here mention some of a general nature.

The first difficulty is to be reasonably sure that a total eclipse was really the phenomenon observed. Many of the statements supposed to refer to total eclipses are so vague that they may be referred to other less rare phenomena. It must never be forgotten that we are dealing with an age when accurate observations and descriptions of natural phenomena were unknown, and when mankind was subject to be imposed upon by imaginary wonders and prodigies. The circumstance which we should regard as most unequivocally marking a total eclipse is the visibility of the stars during the darkness. But even this can scarcely be regarded as conclusive, because Venus may be seen when there is no eclipse, and may be quite conspicuous in an annular or a considerable partial eclipse. The exaggeration of a single object into a plural is in general very easy.

Another difficulty is to be sure of the locality where the eclipse was total. It is commonly assumed that the description necessarily refers to something seen where the writer flourished, or where he locates his story. It seems to me that this cannot be safely done unless the statement is made in connection with some battle or military movement, in which case we may presume the phenomena to have been seen by the army.

II. *The series of lunar eclipses recorded by Ptolemy in the Almagest, and used by him as the foundation of his lunar theory.*

These are nineteen in number. They were observed at Babylon, Rhodes, and Alexandria, and extend over a period of eight centuries. Supposing them to be affected only with the accidental errors of observation, the comparisons with HANSEN's Tables made by HARTWIG seem to indicate that the probable error of each recorded time is between fifteen and twenty minutes. The probable error of a mean epoch derived from all the observations will then be about four minutes, and the corresponding probable error of the moon's mean longitude will be 2′. But there are two circumstances which prevent our assigning quite this degree of accuracy to PTOLEMY's record.

The first is applicable to all observations of the beginning and end of eclipses. It is that the first contact is never really seen, and the eclipse can never become visible until a sensible interval *after* the time of real contact. We must expect that, as a general rule, the recorded times of the beginning of eclipses will be too late by a certain sensible amount, and those of the end too small by an amount somewhat less.* If we knew that the observers had always been on the alert for the eclipse, and keenly alive to the necessity of seeing it at the earliest moment, and of noting its time immediately, some estimate of the intervals in question might be made, and the results corrected accordingly. But, in these observations, we cannot safely apply any such estimate, and must determine the sum of the two errors from the discordances between beginning and end. In the case of eclipses in which only the time of the middle is given, we have no means of knowing whether this time is a mean of observed times of beginning and ending, or whether, in the case of partial eclipses, it was the time when the observer thought the eclipse had reached its greatest phase. Happily, where beginnings and endings are both observed, the errors will be in opposite directions, and will partially eliminate each other. The only remaining doubt will arise from our ignorance of the amount by which the error of the beginning exceeds that of the end: in general, I should think the ratio would lie between 1.5 and 2, a range which reduces the outstanding uncertainty to a quite small amount.

The other circumstance is that the observations which have reached us are not a complete series, but only a selection made for the foundation of a theory—possibly a preconceived theory. In fact, PTOLEMY has been strongly suspected of selecting such observations from the records as would make the results fit his theory. BULLIALDUS founds this accusation upon PTOLEMY's own statement that HIPPARCHUS employed a different interval between two of his eclipses from that calculated by himself. But it does not seem probable that one who had dishonestly altered the records in his possession would have thus frankly stated the result of his alteration. It seems more likely that there was something in the calculation of HIPPARCHUS which PTOLEMY failed to understand, a circumstance not at all improbable.

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* Since this was written, an examination of eclipses has led me to suspect that the older observers often anticipated the times of their actually seeing an eclipse become sensible to the sight, and recorded an estimated time of true geometrical contact.

My own judgment of the reliableness of PTOLEMY's lunar eclipses is founded on these considerations. First, they are not to be accepted without question, because the fact that PTOLEMY deduced from a comparison of his own equinoxes with those found by HIPPARCHUS the same erroneous value of the equinoctial year ($365^d\ 5^h\ 55^m\ 12^s$, a quantity too great by $6^m\ 26^s$) which HIPPARCHUS himself deduced, leads to a very strong suspicion that his observations might be in some way made or selected to fit a preconceived theory. Yet all of PTOLEMY's *Almagest* seems to me to breathe an air of perfect sincerity. We must remember that the scientific logic to which a selection of observations is opposed had then no existence in men's minds. The question arises whether we have any strong reason to fear that the observations quoted by PTOLEMY were selected to confirm some preconceived theory of the moon's motion; and, if so, whether such a selection would be likely to result in making the moon's mean longitude systematically incorrect during the eight centuries through which the observations extend. Expressing no opinion on the former question, I am inclined to answer the latter in the negative. Even if there was such a selection, it was probably made in favor of a theory of the moon's mean motion founded on other observations now lost, and therefore entitled of itself to weight. The elements which PTOLEMY sought to determine from the observations in question were so numerous that it does not seem likely that the mean longitude of the moon would be systematically erroneous throughout the whole series. I consider that, on the whole, the observations in question are much more reliable than the accounts of supposed total eclipses, and yet that their confirmation by independent data is very desirable.

III. Passing over, for the present, a number of isolated observations, all deficient in precision, we reach the observations of the Arabian astronomers. We have already remarked that both DUNTHORNE and LALANDE, in determining the secular acceleration, made use of two eclipses observed at Cairo in the tenth century. These seem to have been derived from the *Prolegomena* to the posthumous collection of TYCHO BRAHE's observations, published under the title of *Historia Coelestis*, where they are given on the authority of SCHICKARD. These observations were derived from an Arabic manuscript belonging to the University of Leyden, of which little was known until near the end of the last century. It was then loaned to the French government, and a translation was made by CAUSSIN, and published by the government in 1804, under the title of *Le Livre de la Grande Table Hakémite.* The greater part of the eclipse observations had previously been published in *Mémoires de l'Institut National des Sciences et Arts.—Sciences Mathématiques et Physiques,*—Tome ii, Paris, An vii; but a few changes are made in the separate edition.

I think this work contains what are entitled to be considered the earliest astronomical observations of eclipses which have reached us. Some of the data left us by PTOLEMY, THEON, ALBATEGNIUS, and others may be results of astronomical observations; but in no case, so far as I know, have the quantities actually observed been handed down to us. For example, we can neither regard midnight nor the middle of an eclipse as capable of direct observation; but, in the present work, we find given the altitudes of celestial bodies at the moments of beginning and ending of eclipses,—data which are not likely to be tampered with to agree with the results of calculation. The entire number of eclipses recorded is twenty-eight, of which both beginning and end were usually observed. The altitudes are given sometimes in whole degrees only, sometimes in coarse fractions of a degree. If they were always given to the really nearest entire degree, so as to be affected with a probable error of only fifteen minutes, the corresponding error in the moon's mean longitude would average about forty or fifty seconds of arc, and would therefore be very small in the mean of all the observations. The most serious source of error is that already alluded to,—the uncertainty how long after the first contact the eclipse was first perceived and the altitude taken, and how long before the actual end it was lost sight of. It is not of much use to guess these quantities until we discuss the observations; but I hope that the probable error of the mean of all the observed times can be reduced to less than two minutes, so that the probable error of the moon's mean longitude will be not more than a minute of arc.

IV. *Observations by Europeans before the invention of the telescope.*

Regiomontanus and Walther.—So far as I can learn, we have nothing that can properly be termed astronomical observations of eclipses between those of the Arabians and those of REGIOMONTANUS and WALTHER in the latter part of the fifteenth century. My authority for them is a volume containing two works, paged separately, under the respective titles:—

(1) *Coeli et Siderum in eo errantium observationes Hassiacae illustrissimi principis Wilhelmi Hassiae, landgravii auspiciis quondam institutae et spicilegium biennale,* . . . *quibus accesserunt Joannis Regiomontani et Bernardi Waltheri observationes Noribergicae. Lugduni Batavorum,* 1618.

(2) *Johannes de Monte-Regio, Georgii Puerbachii, Bernardi Waltheri ac aliorum, eclipsium, cometarum, planetarum ac fixarum observationes.* . . . .

These observations belong to the same class with those of the Arabians, namely, altitudes of the sun or moon at the times of the beginning or ending of the eclipses, and do not seem in any way more trustworthy. The telescope not being known, the same uncertainty must rest over the question of the exact phase at which the eclipse became visible or disappeared from view. The altitudes are given only in coarse fractions of a degree. The epoch being less than half as remote as that of the Arabian observations, the coefficient of secular acceleration will not be one fifth as great. For this reason I do not consider these observations worth using at all.

Tycho Brahe.—The observations of TYCHO follow those of REGIOMONTANUS by about a century. The confused manner in which most of the works of this astronomer have been edited and published makes exact researches into their subjects rather difficult, and it is the less necessary to present any such researches that I have decided to make no use of the observations. I have been led to this course by the following considerations. The telescope was unknown to TYCHO. Granting that the most careful observations were made by him, the probable constant error of contacts observed without a telescope, and, without any means of determining the smallest amount of impingement of the moon on the sun or of the earth's shadow on the moon which he could see, can hardly be estimated at much less than 20″. A number of accurately determined times of contact would be necessary even to reduce the error to this amount. After devoting considerable time and labor to an examination of what purport to be the observations of TYCHO, both those printed, and those in manuscript at the Paris Observatory, I was scarcely able to find what could be regarded as accurate and reliable observations of eclipses. In the *Progymnasmata*, there is a series of some thirty solar and lunar eclipses observed by him between 1572 and 1600. Only a single time is given for each eclipse, and from a comparison with the *Historia Coelestis* it may be conjectured that these are the times of greatest phase. Comparing the dates in this series with the observations, which are arranged in chronological order, only some of the later eclipses were to be found at all. Among these few I found scarcely an unequivocal observation of the beginning of an eclipse, and only occasional observations of an ending. The phases were given, not by measure, but by drawing a diagram showing how the eclipse appeared from time to time. There was no evidence that these diagrams had been laid down by measure, either by the astronomer or by the copyists who followed him. It was generally doubtful whether the times were apparent times, or those of one or the other of two clocks. Finally, the discrepancies between the manuscript and the observations printed in the *Historia Coelestis* were so numerous as to destroy all confidence in either.

It is wonderful if so indefatigable an observer never observed an occultation of a star or planet by the moon, yet I have never succeeded in finding any such. I made a careful examination of his observations during the periods in which occultations of Aldebaran must have occurred without finding any allusion to such a phenomenon.

V. *Observations made with the telescope, but without a clock.*

Bullialdus and Gassendus.—The application of the telescope to the observation of eclipses and occultations may be considered as commencing with these observers. They had no clock. The times were fixed by noting the altitude of the sun or some bright star at the moment of the phenomenon. GASSENDUS sometimes had an assistant, who used the quadrant, while he himself noted the time of the phenomenon by a signal.

This mode of observing ought to be susceptible of considerable accuracy. GASSENDUS's quadrant seems to have read at least to 5′, and an altitude of the star to the nearest 5′ would generally be equivalent to a place of the moon to the nearest 15″. In other words, the probable error in the moon's position would be only about 4″, if the altitude were really noted to the nearest 5′. But the observations of GASSENDUS exhibit anomalies which I find it difficult to account for. He frequently gives the altitudes of two or more objects corresponding to the same occultation, though it is quite certain that only one could have been observed at the proper moment. In these cases, we should expect the second altitude to give a time systematically a little later. Sometimes we actually find it so, but sometimes it is earlier. When the same pair of stars are thus repeatedly observed in the course of a series of occultations observed on a single evening, we generally find the difference of the computed times nearly the same; but, another pair being observed at another time, the difference changes its character entirely. The most embarrassing case is that of the occultation of γ Capricorni, 1635, August 26, where he gives in succession the altitudes of α Arietis, the moon's limb, and α Andromedæ, and adopts a time near the mean of the three results, of which the extremes differ more than three minutes.

I have found no other case so bad as this. The general agreement of the observations is such that we may generally consider each time to be affected with a probable error not differing greatly from fifty seconds, corresponding to a change of 25″ in the longitude of the moon. We have no means whatever of judging whether the observations of BULLIALDUS are better or worse than those of GASSENDUS, and so may for the present assume them to have the same value. We have, in the observations of both, the equivalent of about twenty observations to dispose of; and, if each gives the moon's longitude with a probable error of 15″, the mean of all may be assumed to be good within 5″ or 6″. The mean epoch will not be far from 1640.

VI. *Observations of Hevelius.*

The observations of HEVELIUS, as given in his *Machina Coelestis* and *Annus Climactericus*, extend from 1639 to 1683. With them commences the use of the clock in the observations of eclipses and occultations, the clock being regulated by observed altitudes of the sun or stars. This gives us more definite means of estimating the probable errors of the observed times, which may be inferred from the discordance of the separate determinations of clock-error. From the best estimate we can form, the probable error of the several determinations of time will fall between 20 and 24 seconds. Taking the latter limit, the probable error of each determination of the moon's longitude will be about 12″. We have in the work of HEVELIUS the apparent equivalent of about forty average occultations to dispose of. The probable error of the moon's longitude which results from the mean of all his observations will therefore, if no other errors than such accidental ones as these enter, not be more than 2″. Allowing for probable unknown causes, we may estimate it at 3″. The mean epoch is about 1675.

VII. *Observations approaching the modern requirements in respect to precision.*

Flamsteed.—Flamsteed's observations were made on the same system as those of HEVELIUS, but with far greater accuracy. His quadrant was supplied with "telescopic sights", which HEVELIUS never adopted, and by which the probable error of the time deduced from a single altitude was reduced to two or three seconds. His clocks were much better than those of HEVELIUS, though far inferior to those of his contemporaries on the continent. A partial drawback to these advantages is that his clock-error was not determined often enough, nor near enough to the times of observations. Another weak point, which is also a mark of HEVELIUS's observations, is that he never seems to have had the idea of eliminating any possible index-error of his quadrant by altitudes on opposite sides of the meridian, but would, month after month, if not year after year, determine nearly all his clock-errors by observations in the east alone, or the west alone. An estimate of their probable error would therefore be such mere guesswork that I shall not attempt it.

The Paris astronomers.—With the foundation of the Paris Observatory, a yet farther improvement was made in the art of determining the time, and one so great that the observations of occultations made there between 1680 and 1720 are frequently comparable in accuracy with those of the present time. The mode of determining the clock-correction was substantially as follows:—A quadrant, gnomon, or meridian-mark was set as nearly as practicable in the plane of the meridian, and was left undisturbed in position during long intervals. With this instrument, the clock-time of meridian transit of each limb of the sun was assiduously observed on every day that the weather permitted. The clock-time of meridian passage was also determined from time to time by equal altitudes of the sun on the two sides of the meridian, observed with a quadrant. The time deduced from the equal altitudes being compared with that deduced from the meridian passage gives a correction to the meridian-instrument applicable to the particular altitude of the sun on that day. The correction being found for various altitudes of the sun, its value for any particular altitude may be found by a curve or by interpolation, and thus the correction for each day may be deduced.

From the general accordance of the different results for clock-error and for the correction of the meridian, as well as from the discordance of independent observations of the same occultation, it may be inferred that the probable error of a time well determined in this way was not more than two seconds, corresponding to an error of 1″ in the moon's longitude. This is so small that it does not exceed the probable error arising from the irregularities of the moon's limb, which, from a comparison of occultations observed at various places, would seem to be nearly 1″. The probable error of the position of the moon's centre will therefore vary from 1″ to 1″.4, according to the point of the limb on which the occultation was observed. The probable error of the star places and of the tabular perturbations is larger than this, and may be expected to increase the probable error to 3″. After gleaning out all the uncertain observations, we shall have the equivalent of more than sixty good occultations observed at the Paris Observatory between the years 1680 and 1720. These ought to give the mean longitude of the moon for the epoch 1700 without a probable error of more than 0″.6.

Of the same class of observations here described are those made by **Delisle** at St. Petersburg between the years 1724 and 1748. In fact, during the interval 1720 to 1753, we have an average of nearly one good occultation per year at St. Petersburg and Paris, so that the mean longitude of the moon can be fixed during this interval within one or two seconds of arc.

VIII. *Observations since the time of Bradley.*

From the year 1750 to the present time, we have a nearly continuous series of occultations and eclipses, observed with a high degree of accuracy at observatories whose positions are well known, notably those of Greenwich and Paris. Of course, these observations become more and more numerous as we approach the present time. Let us next inquire how accurately the mean motion of the moon can be determined from these observations. I conceive that between the epochs 1780 and 1820 we shall find at least 150 well-observed occultations. If we omit a third of these as being cases where the star was too far from the line of motion of the moon's center to give a good determination of the moon's longitude, we shall have 100 left suitable for this determination. If we take the probable error of each longitude derived from a single occultation as 2″.0, which I think is not far from the truth, the probable error of the mean of all will be 0″.20, and the epoch will be about 1800. Allowing for systematic differences between observers, it may be increased to 0″.30. Again, from the more numerous observations on both sides of the epoch 1875, we may hope to obtain the moon's mean longitude for that epoch with the same precision. By a comparison of the two, the moon's mean motion during the first seventy years of the present century will be obtained, with a probable error of $0''.4$, the corresponding epoch being 1837. The two epochs compared, conjoined with the observations between 1820 and 1850, will give the mean longitude for 1837 with a probable error which, for our present purposes, may be regarded as insignificant.

Now, suppose that, with the mean longitude and mean motion thus determined, we carry back the position of the moon to the epochs of the observations previous to 1720, and, considering the difference as due solely to the secular acceleration, determine the latter from the comparison of the observed and computed longitudes, what will be the probable errors of the several results? The probable error of the computed mean longitude will be, with sufficient approximation, $0''.6\,T$; T being the number of centuries from 1837. If we represent by e the probable error of the mean longitude derived from observation, the probable error of the comparison will be

$$\sqrt{0''.36\,T^2 + e^2},$$

and the probable error of the value of the secular acceleration deduced from the comparison will be

$$\frac{\sqrt{0''.36\,T^2 + e^2}}{T^2} = \varepsilon.$$

The values of the several quantities which we have estimated for each series of observations or other data are given in the following table, the last series of numbers being the probable error of the secular acceleration which would result from a comparison of the observations with a lunar theory derived from observations between 1780 and 1875.

Data or observers.	T.	e.	ε.
		″	″
PTOLEMY'S eclipses	21.4	200.	0.4
Arabian eclipses	8.8	60.	0.8
BULLIALDUS and GASSENDUS . . .	1.95	5.	1.3
HEVELIUS	1.6	3.	1.0
Paris and Greenwich astronomers .	1.35	0.6	0.6

From this reasoning, we may draw the following conclusion:—*Granting the fundamental premises on which we have reasoned, the secular acceleration of the moon can be determined with nearly the same order of accuracy from the modern as from the ancient observations.*

The writer is quite conscious that the degree of accuracy here assigned to the results is something to be hoped for rather than expected, and that many astronomers may consider, not without some reason, that the degree of precision attainable has been greatly exaggerated. To judge of the precise state of the question, it may not be amiss to present some considerations on the premises, expressed or implied, from which we have reasoned. They are substantially:—

(1) That a theory can be constructed which shall accurately represent the real and apparent inequalities of long period in the moon's mean longitude. This involves

the three conditions that the motion of the moon is affected only by the gravitation of the known bodies of the solar system; that the effect of this gravitation can be accurately calculated; and that the motion of rotation of the crust of the earth upon its axis is invariable, a uniform secular retardation excepted. A failure in any one of these conditions will destroy the basis of the preceding calculation, and will increase the probable error of the results derivable from the modern observations much more than in the case of the ancient ones. It is useless to speculate upon the probability that these conditions will be fulfilled.

(2) The other hypothesis is that the observations are not affected by any systematic error nearly as great as the probable error of the mean derived from each series of observations. Among the sources of such systematic errors are to be included erroneous longitudes of observatories, constant instrumental errors in the determination of time, and any habit peculiar to the observer by which he systematically observes an occultation differently from the transit of the sun's limb or of a star.

I do not think that these errors will very largely increase the probable error of the results, because occultations, if actually observed, are peculiarly free from systematic error. If we take the probable errors which we have supposed for the moon's longitude at the three epochs 1700, 1800, and 1870, and reduce them to time, they will amount to about $1^{\mathrm{s}}.2$, $0^{\mathrm{s}}.6$, and $0^{\mathrm{s}}.6$ respectively, quantities far greater than the average observed personal equations between different observers. Now, we have tacitly supposed it an even chance that the mean of a series of observations extending over a period of forty years, made by a number of different observers and in a number of different ways, did not exceed 1^{s} during the interval 1680–1720, and $0^{\mathrm{s}}.5$ during the interval 1780–1820, and I do not think this estimate will seem extravagant. In regard to the possible erroneous difference of longitude between Paris and Greenwich, it is to be remarked that observations were made at both these places during the intervals we have been considering, and in such numbers that the error will be nearly eliminated from the lunar elements.

However, a certain and perhaps very sensible increase in the probable errors of the results is no doubt to be looked for; but a partial or entire set-off against them is to be found in the fact that more observations are actually available than we have supposed to be included in forming the basis of our theory, and, when these are added, the precision of the result will be sensibly increased.

In the preceding enumeration, I have included only classes or series of observations. In addition to these, there is a great number of isolated observations, both ancient and modern, of every variety of excellence, which I have not deemed it necessary to enumerate, because their value can be determined only by comparison and discussion. They will, of course, add slightly to the accuracy of the data for the final determination of the required element. Altogether, I think there would be room to hope that we might obtain the secular acceleration from the modern observations alone, with a probable error of scarcely more than half a second, if only the long-period inequalities in the moon's motion were conclusively settled. This is something which is still in the future.

§ 3.

DISCUSSION OF THE NARRATIVES OF ANCIENT HISTORIANS FROM WHICH IT HAS BEEN INFERRED THAT THE SHADOW OF THE MOON PASSED OVER CERTAIN POINTS OF THE EARTH'S SURFACE DURING CERTAIN TOTAL ECLIPSES OF THE SUN.

The general difficulties in the way of obtaining any approach to certainty respecting the totality of these eclipses have been discussed in the preceding section. We now pass to the special circumstances of each eclipse. The following is, so far as I am aware, a complete list of the eclipses in question which the accounts of the narrators have been supposed to justify us in considering total. They are arranged in chronological order, and are selected without respect to their confirmation by the tables.

1. The eclipse of THALES, —584, May 28, of which the original narrative is in HERODOTUS, i, 74. The eclipse is also mentioned by PLINY, *Hist. Nat.*, ii, 12, and by CICERO, *De Divinatione*, i, 49. This eclipse has, perhaps, been the subject of more discussion during the present century than any other of those under consideration.

2. The eclipse of Larissa, —556, May 19, discussed by AIRY in the *Memoirs of the Royal Astronomical Society*, vol. xxvi, and by HANSEN in his *Darlegung*, ii, p. 376. The original narrative is found in the *Anabasis* of XENOPHON, iii, 4.

3. The eclipse of XERXES, about —479, described by HERODOTUS, *Hist.*, vii, 37. This eclipse has never been identified astronomically. Reference may be made to AIRY's paper in the *Philosophical Transactions*, and to ZECH's prize memoir, already quoted.

4. An eclipse at Athens, —430, August 3, mentioned by THUCYDIDES, *Hist.*, ii, 28. This eclipse is No. 2 of ZECH's list.

5. The eclipse of ENNIUS, —399, June 21, quoted from ENNIUS by CICERO, *De Republica*, i, 16, discussed by HANSEN, *Darlegung*, ii, p. 386.

6. The eclipse of AGATHOCLES, —309, August 14, described by DIODORUS, *Bibl. Hist.*, xx, 5, and by JUSTINUS, *Hist. Philip.*, xxii, 6. This is No. 9 of ZECH's list, and is very fully discussed by AIRY in the *Philosophical Transactions* for 1853, and in his second paper (*Mem. R. A. S.*, xxvi), as also by HANSEN in his *Darlegung*, ii, p. 382.

7. Eclipse of 334, July 17, No. 15 of ZECH's list, which might have been total in Sicily from the description of FERMICUS, *Mat. Ast.*, i, 2.

8. Eclipse of 364, June 16, described by AMMIANUS MARCELLINUS, *Rer. Gest.*, xx, 3, as total at Eoos.

The author not being himself versed in the Greek language, the original narratives of these several eclipses were submitted to Professor HUNTINGTON of the Columbian University, who kindly furnished translations and critical renderings of the several passages which have been used in the discussion. In general, it has not been deemed necessary to quote the original; but wherever this seemed requisite to form a judgment of the subject-matter, it has been done.

1.—THE ECLIPSE OF THALES.

(—584, May 28.)

The account by HERODOTUS is as follows. Professor HUNTINGTON'S translation is annexed:—

HD., i (KΛ.), 74.

Μετὰ δὲ ταῦτα (οὐ γὰρ δὴ ὁ Ἀλυάττης ἐξεδίδου τοὺς Σκύθας ἐξαιτέοντι Κυαξάρεϊ) πόλεμος τοῖσι Λυδοῖσι καὶ τοῖσι Μήδοισι ἐγεγόνεε ἐπ᾽ ἔτεα πέντε· ἐν τοῖσι πολλάκις μὲν οἱ Μῆδοι τοὺς Λυδοὺς ἐνίκησαν, πολλάκις δὲ οἱ Λυδοὶ τοὺς Μήδους· ἐν δὲ, καὶ νυκτομαχίην τινὰ ἐποιήσαντο. διαφέρουσι δέ σφι ἐπὶ ἴσης τὸν πόλεμον, τῷ ἕκτῳ ἔτεϊ συμβολῆς γενομένης, συνήνεικε ὥστε τῆς μάχης συνεστεώσης τὴν ἡμέρην ἐξαπίνης νύκτα γενέσθαι. τὴν δὲ μεταλλαγὴν ταύτην τῆς ἡμέρης Θαλῆς ὁ Μιλήσιος τοῖσι Ἴωσι προηγόρευσε ἔσεσθαι, οὖρον προθέμενος ἐνιαυτὸν τοῦτον, ἐν ᾧ δὴ καὶ ἐγένετο ἡ μεταβολή. οἱ δὲ Λυδοί τε καὶ οἱ Μῆδοι ἐπεί τε εἶδον νύκτα ἀντὶ ἡμέρης γινομένην, τῆς μάχης τε ἐπαύσαντο, καὶ μᾶλλόν τι ἔσπευσαν καὶ ἀμφότεροι εἰρήνην ἑωυτοῖσι γενέσθαι.

"Now after this (for ALYATTES did not by any means surrender the Scythians at the demand of CYAXARES) there was war between the Lydians and the Medes for the space of five years, in which [period] the Medes often conquered the Lydians, and the Lydians, in turn, the Medes. And, in this time, they also had a night engagement; for as they were protracting the war with equal success on each side, in a battle that occurred in the sixth year, it happened, as the armies engaged, that the day was suddenly turned into night. Now this change of day [into night] THALES, the Milesian, had predicted to the Ionians, placing as the limit of the period [within which it would take place] this very year in which it did actually occur. Now, both the Lydians and the Medes, when they saw night coming on, instead of day, ceased from battle, and both parties were more eager to make peace with each other."

Among the ancient solar eclipses, this is the one which has been the most celebrated, and has given rise to most discussion in recent times. Yet the proof of its reality seems to me by no means convincing. It is true that we may consider the three following propositions to be individually sufficiently well established:—

(1) That a battle between the Lydians and the Medes was ended by an apparently sudden advent of darkness, substantially as described by HERODOTUS;

(2) That on May 28, 584 B. C., the shadow of the moon passed over Asia Minor, as computed from the tables;

(3) That THALES predicted eclipses.

But that these propositions all refer to one and the same event I see no sufficient reason for holding. Their connection may well be real; but its reality is not so well established that I should be willing to predicate anything respecting the changes of the lunar elements upon it. It seems to me that commentators on this eclipse have not sufficiently distinguished between the phenomenon as seen by the contending armies, and the conclusions drawn by the Ionians that that phenomenon was what their favorite philosopher had predicted.

The simple event, as described by HERODOTUS, and as we may suppose it to have been described by the eye-witnesses, would hardly even suggest an eclipse of the sun, or anything else more extraordinary than the regular advent of night, except for the single word *ἐξαπίνης* (suddenly). But, in the ardor of battle, the combatants are apt to be nearly oblivious of the lapse of time, and the gradually increasing darkness of evening might well be unnoticed for some time, so that, when it at last interfered with the progress of the battle, it would seem to have come on more rapidly than usual. The formation of a very dark heavy cloud about sunset, or shortly after, such a one as is seen fifty times to one occurrence of a total eclipse of the sun in any given place, might render the description literally true. If it be urged that the making of peace indicated something extraordinary or impressive, we may rejoin that there is nothing in the account to indicate it; that if the phenomenon was really that of a total eclipse, the night must have turned back to day again almost before the fighting could stop, a fact which the historian does not mention; and, finally, that the term *νυκτομαχίην* would hardly apply to the case of a battle stopped by a total eclipse in which the darkness lasted only a few minutes and the battle ceased as soon as darkness commenced.

This view of the naked narrative will not, I conceive, be disputed. The evidence in favor of an eclipse rests entirely on the construction put upon the account by the Ionians, or some other parties to whose ears the narrative came. It cannot be supposed that the combatants knew anything about THALES or his eclipse, so they cannot be the authority for supposing that the darkness was that predicted by THALES. Our belief in the eclipse therefore rests on our faith that the Ionians heard a different story of the battle from that given by HERODOTUS, and that they put a correct interpretation on the circumstances. In trying to form a judgment whether they did so, we must take into account what we know must have been the nature of the prediction, as well as the narrative of the phenomenon; because it is on the agreement of the two that all the evidence in favor of the reality of the eclipse rests. Now, keeping within the limits of historic probability, THALES could not have had any other data for prediction than a knowledge of the Saros, which gave the order in which eclipses would occur, and, at the most, such knowledge of the motions of the sun and moon as would enable him to judge whether a given conjunction was nearly central, and at what time of day it would occur. He could not possibly have predicted that the eclipse would be total, and that day would be turned into night, and could scarcely have decided whether it would or would not have been visible in Ionia even as a partial one. If he could predict one, he could predict two or three every year, without being able to say with any certainty in what places any of them would be visible. But any such prediction necessarily involves a knowledge of the exact day of occurrence of the eclipse, and thus the only means by which the Ionians could identify the phenomenon would be the coincidence of the day of its occurrence with that of the prediction. Now, it is remarkable that the narrative says emphatically that the year was correctly predicted, but makes no reference to the yet more striking prediction of the day.

Astronomically, we are not directly concerned with the prediction of THALES, but only with the question whether the circumstance described by HERODOTUS was really the total eclipse which we know occurred in Asia Minor or its neighborhood, B. C. 584. The prediction is important only for the reason that its mention by the historian furnishes the only evidence in favor of the phenomenon being really an eclipse. Another very weak point in the evidence is that we have no historic data for deciding who first drew the conclusion that the darkness which stopped the battle was that of the predicted eclipse. It may have been the Ionians, it may have been some writer to whose knowledge the occurrences came, and it is quite consistent with the character of HERODOTUS to suppose that it may have been himself. Since, as we have seen, the identification could only have properly rested on the coincidence of the day of the prediction with that of the battle, and since the historian mentions only a coincidence of year, if we accept the eclipse we must suppose that the most striking and important circumstance was dropped from the narrative during the interval between the identification and the narration by the historian. If the historian himself drew the conclusion, without any other data than those he gives and those with which we may suppose him to have been acquainted, then the entire evidence falls to the ground.

Let us now consider what we may suppose to have been more or less probable states of the case. THALES is supposed to have been born B. C. 640, and to have traveled into Egypt at an early age, where he learned astronomy from the priests. Returning home, he probably applied this, and whatever other knowledge he may have gained from research and observation, to the prediction of eclipses. He may have predicted many eclipses from B. C. 610 to B. C. 584, and longer, as he is said to have lived to a great age. His success in the case of the solar eclipse B. C. 584 gave him a wide celebrity, as we know from the tables that this eclipse was total at no great distance from his birthplace. That he predicted only a single eclipse is highly improbable; that, in addition, this one should prove to be total within a hundred miles of his birthplace transcends all reasonable probability.

Some time between the dates we have mentioned, a battle was fought somewhere in Asia Minor, probably very far from the home of THALES, in recounting which some of the participants expressed surprise at the suddenness with which it was stopped by darkness. The story may have passed through several mouths before it reached any one who knew about THALES, and may have been somewhat exaggerated in the narration. At length, it reached the ears of the admirers of the philosopher, who, recollecting what he was doing, and knowing that he had predicted an eclipse for that very year, seized upon the story as a confirmation of the prediction.

Who these persons were, and in what part of the century which elapsed before HERODOTUS they lived, we can only conjecture. We can make many hypotheses, on which the probability of the correctness of the conclusion becomes smaller and smaller, until we approach the time of the historian, when it vanishes entirely. Under these circumstances, it seems to me that while the hypothesis of correctness is not an entirely inadmissible one, it rests on too slight a foundation to be employed as a basis for correcting the lunar tables. The rejection is farther justified by the uncertainty where the battle was fought, and the considerable breadth of the shadow, which leaves us a wide range for central line of eclipse. I shall therefore not make any use of the eclipse of THALES.

2.—THE ECLIPSE AT LARISSA.

The account of this eclipse, as translated by Professor AIRY, is as follows:—

"When the Persians obtained the empire [of the east] from the Medes, the king of the Persians besieged this city, but could not in any way take it. But a cloud covered the sun and caused it to disappear completely, till [*i. e.* to such a degree that] the inhabitants withdrew, and thus the city was taken. Close to this city was a pyramid of stone, 1 plethrum in breadth, 2 plethra in height. Thence the Greeks proceeded 6 parasangs, to a great deserted castle by a city called Mespila, formerly inhabited by the Medes. The substructure of its wall was of squared stone, abounding in shells. The king of the Persians besieged it, but could not take it. ZEUS, however, terrified the inhabitants with thunderbolts, and so the city was taken."

Professor AIRY adds, "It cannot be doubted, I think, that the disappearance of the sun at Larissa was caused by a total eclipse."

I confess myself unable to share the confidence of the Astronomer Royal and of HANSEN that we have here a total eclipse of the sun. The narratives of these times contain many accounts of wonderful occurrences, in which we know that a liberal allowance is to be made for the flight of the imagination; and it is not entirely logical to accept unhesitatingly all those statements which we can reconcile with our knowledge, while we reject all others. No doubt, if we knew the day, or even the year, of the event described by the historian, and found it to be identical with that of a total eclipse, we should be justified in accepting the coincidence without question; but as the uncertainty of date increases, the probability of coincidence becomes less and less. If, at an epoch so remote, we have a century to find our eclipse in, we can select any place at random, with a decided preponderance of chances in favor of our finding one or more eclipses which, making allowance for the uncertainty of the tables, may have been total at the point selected. It appears that the Astronomer Royal had a period of forty years to find the eclipse in, and the fact that one was found in this interval may be considered as rendering the hypothesis of an eclipse somewhat probable. Notwithstanding my want of confidence, I conceive the probability of a real eclipse to be greater than in the eclipse of THALES, while we have the great advantages that the point of occurrence is well defined, the shadow narrow, and, if it was an eclipse at all, the circumstance of totality placed beyond serious doubt.

3.—THE ECLIPSE OF XERXES (ZECH, No. 1).

(— 477 to — 480, spring of year.)

This eclipse occurred during the march of XERXES against Greece, in the same year in which the battle of Salamis was fought.

The descriptions are found in HERODOTUS and ARISTIDES.

From HERODOTUS, vii, 37:—

"When the army, having come out of their winterquarters, in the opening of the spring, fully equipped, set out from Sardis, for the purpose of marching to Abydos; and when they had begun their march, the sun, leaving his seat in the heavens, was concealed from view, and night instead of day came on, though the weather was not cloudy, but was exceedingly clear."

From ARISTIDES, *Scholiast.*, ed. FROMMEL, p. 222 (quoted from ZECH, p. 39):—

"As the king was going against Greece, and had come into the region of the Hellespont, there happened an eclipse of the sun in the east; for it portended to him his defeat, that the sun was eclipsed in the region of its rising, since XERXES also was marching from the east."

If any justification for entire want of confidence in the eclipse of THALES, and in ancient total solar eclipses generally, were required, it is found in the fact that this description cannot be identified with any total eclipse of the sun. Of all descriptions of such eclipses by the Greek historians, this is the one which is, all things considered, most clear and explicit. No known natural occurrence but a total eclipse of the sun could give rise to the circumstances described by Herodotus. The place and the season are clearly specified, and the year is one about which I am not aware that chronologists have entertained any serious doubt. The time of day (morning) is obscurely indicated by the account of Herodotus, and clearly stated in that of Aristides; yet the astronomical tables seem to show in the most conclusive manner that no total eclipse of the sun could have been visible at Sardis at that time. I am not aware that any one has given any explanation of the occurrence which will reconcile the statement with the tables. Professor Airy considers the most probable explanation to be that the eclipse was not one of the sun at all, but that of the moon which occurred B. C. 479, on the morning of March 14.* On this theory, the circumstance first to be remarked is that it is clearly incompatible with the narrative. The incompatibility is explained by Sir George by supposing that Herodotus was mistaken in the single circumstance of the eclipse being one of the sun, that historian repeatedly expressing himself "doubtful on matters of detail which occurred during the movements of Xerxes on the eastern side of the Aegean sea". While, however, such a mistake as the substitution of the moon for the sun is quite possible, it must be admitted that the words "instead of day it became night" cannot be thus explained. The explanation, therefore, how probable soever it may be, presupposes so much play of the imagination on the part of the historian as to render him unworthy of that amount of confidence in matters of detail which would justify our changing the lunar tables to accord with his statements.

Zech† proposes yet another explanation, namely, that the eclipse in question was that of −477, February 16, which, according to the tables of De Damoiseau, was annular at Sardis. If this were correct, it would be necessary to change the usually received date of the battle of Salamis by two years. The question is, however, one of purely chronological interest, because, if the eclipse was not total, no conclusion can be drawn from it astronomically. The accounts of the historians do not enable us to decide whether the annulus was formed at Sardis; hence no conclusion respecting the position of the central line can be drawn.

4.—THE ECLIPSE AT ATHENS.

(−430, August 3.)

The following is the translation of the description by Thucydides, ii, 28:—

"But in the same manner, at the new moon of the month,—as even in that time alone it seems to be possible for the phenomenon to occur,—the sun was eclipsed after midday, and having assumed a crescent form, some of the stars having also appeared, it again became full-orbed."

From the circumstance that stars were visible, there would seem to be a considerable probability that this eclipse was total. This probability is lessened by the fact that Thucydides describes the sun as having assumed only a crescent form, and by the consideration that it might have been elsewhere than at Athens that the stars were seen. Still, as the sun must have been a crescent before and after totality, I think the probability in favor of the totality of this eclipse is as great as in the case of any other of those under consideration, though not sufficient to justify the introduction of an equation founded on it.

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* *Philosophical Transactions*, 1853, p. 199.

† *Loc. cit.*, pp. 40–43.

5.—THE ECLIPSE OF ENNIUS.

(— 399, June 21.)

This eclipse is introduced because some stress is laid upon it by **Hansen**. The description rests upon the following extract from **Cicero**, *De Republica*, i, 16:—"**Ennius** scribit anno CCCL fere post Romam conditam Nonis Junis soli luna obstitit et nox." The probability that this eclipse was total at Rome does not seem sufficiently great to render it worthy of farther consideration. The tables show that there was a total eclipse about the time of sunset; but I see no reason in the statement quoted for assuming that totality occurred before sunset, or that there was any total eclipse at all.

6.—THE ECLIPSE OF AGATHOCLES.

(— 309, August 14.)

Of all the ancient solar eclipses, this is the one of which the totality may be considered as best established, and to which, therefore, we should have least hesitation in making the lunar tables conform. Unfortunately, there is a doubt whether **Agathocles**, in his passage from Syracuse to Carthage, went on the north or the south side of Sicily. The arguments on the two sides are so evenly balanced that the question can be decided by the lunar tables alone. This renders the point where the eclipse was total so uncertain that the eclipse itself is of little use. By a singular fatality, the admissible limits of the position of **Agathocles** correspond almost exactly to those of the limits of the moon's secular acceleration. The shadow was unusually broad; and between the two extreme hypotheses, (1) that **Agathocles** was south of Sicily and the centre of the shadow south of his position by its semidiameter, and (2) that he was north of the island and the centre of the shadow yet farther north, all intermediate ones are equally possible. While, therefore, we may be justified in making it a test of the correctness of the lunar elements that the computed shadow should fall between these limits, we cannot determine those elements from it.

7.—ECLIPSE OF — 217, FEBRUARY 11.

I was led to consider this eclipse from a statement respecting it by **Ricciolus**, who says (*Almagestum Novum*, p. 365), "Addit Silius Italicus densas fuisse & immensas tenebras in Calabria & subductam esse diei lucem." But, on referring to the original authority, we find the eclipse to become indefinite. The lines alluded to occur in describing the wonders which preceded the battle of Cannæ (viii, 634), and are:—

"Quaesivit Calaber, subducta luce repente
Immensis tenebris, & terram & litora Sipus:
Obseditque frequens castrorum limina bubo."

I find that in this eclipse the central line was far down in Africa, so that it may be dismissed with but a single reflection. If so great a misapplication of the words of a narrator can be made by an astronomer of the seventeenth century, what are we to expect of the ancient historians, and especially of **Herodotus**?

8.—A. D. 360, AUGUST 27.

This is No. 16 in Zech's list, and, from the description given by Ammianus Marcellinus, would appear to have been total in Eoos. But the tables show the eclipse to have been annular, so that we can deduce nothing from it.

MEDIÆVAL ECLIPSES.

Belonging to the same class with those we have cited, but too modern to be decisive of the question of the moon's secular acceleration, are the eclipse of Stiklastad, A. D. 1030, and the total eclipses in which the shadow of the moon passed over Central Europe in the years 1140 and 1143. The last two have been very carefully discussed, and many points at which the eclipse was total determined from the chronicles of the times, by Celoria of Milan in his two papers* published in *Memorie del R. Istituto Lombardo di Scienze e Lettere*, vol. xiii.

The preceding list includes, so far as the writer is aware, all the ancient solar eclipses which have been considered total at any definite point of the earth's surface. The general conclusion to which we are led is that there is no one of these eclipses which we can feel reasonably confident was total at a definite point. The proportion of the eclipses which we know from the tables must have been annular, or, at least, which were not total at the points to which they are referred, is so great as to destroy any confidence which might have been felt in the others. Still, if one value of the secular acceleration should represent them much better than another, it cannot be denied that this fact might militate a little in favor of that value which best represented them. While this consideration cannot aid us in determining the value of the secular acceleration, it may help us in deciding which of several competing values is the most probable. To enable the reader to judge of the application of this test, I arrange the eclipses in what seems to me the order of probability of totality, *judging from the narrative alone*, adding the place where each was supposed to be total

(1)	Eclipse of Agathocles,	— 309.	Total in or near Sicily.
(2)	Eclipse of Xerxes,	— 479 ?	Total at Sardis.
(3)	Eclipse,	— 430.	Total at Athens.
(4)	Eclipse,	+ 360.	Total at Eoos ?
(5)	Eclipse of Xenophon,	— 556.	Total at Larissa.
(6)	Eclipse of Thales,	— 585.	Total in Asia Minor.
(7)	Eclipse,	+ 334.	Total in Sicily.

Of these seven eclipses, the second cannot be identified, while the fourth and seventh must have been annular. We have therefore only four left to test the tables. Of these, the eclipse of Agathocles, the only one in which I can regard the fact of totality as well made out, allows a range of several seconds in the secular acceleration The uncertainty of the remaining three, that at Athens in the year —430, and those of Larissa, and of Thales, has already been discussed. Altogether, it does not seem to me that much light will be thrown by these eclipses on the question of the moon's secular acceleration. It seems to me that the most logical course is to obtain the secular acceleration of the moon from other data, and then to undertake the discussion of the historical evidence anew.

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* (1) *Sull'Eclissi Solare Totale del* 3 *Giugno* 1239.

(2) *Sugli Eclissi Solari Totali del* 3 *Giugno* 1239 *e del* 6 *Ottobre* 1241.

§ 4.

THE PTOLEMAIC ECLIPSES OF THE MOON RECORDED IN THE ALMAGEST.

The most complete discussion of these eclipses is that of Zech, already quoted, in which, however, the treatment is such as not to lead to any definitive result. Zech's comparisons were made with the tables of De Damoiseau, Hansen's tables being still unfinished when his paper was prepared. My general plan of proceeding is this:—From the data given by Ptolemy, and from his interpretation of the data, I form what seems to me the best judgment of the time at which any given phase was actually seen by the observers, and of the probable error of this time, taking care to do this without any knowledge of the way in which the tabular results will come out. For an epoch near this time, the positions of the sun and moon are computed from Hansen's tables, and thence the times of the geometrical phases of the eclipse. This time is then compared with that observed, and an equation of condition thence deduced. In the equations, the only indeterminate quantities which it is worth while to include are the moon's longitude and the error of the estimate of the phases of beginning and ending, arising from the fact that the eclipse must have advanced past the phase of beginning before being seen, and must have disappeared before the actual ending

In computing the places of the moon, I have not deemed it necessary to take into account the small terms which are included in the tables of double entry, as their probable sum is far below the probable error of the individual observations. The sum of the constants added to these tables, or 0.0022240 in units of the fundamental argument, has, however, been included with the terms, to avoid any constant error arising from this source.

The positions of the places of observation—Babylon, Rhodes, and Alexandria—have been taken from Zech, as follows:—

Babylon, $2^h\ 56^m$ east from Greenwich; latitude, $+32°\ 15'$.
Rhodes, $1^h\ 53^m$ east from Greenwich; latitude, $+36°\ 27'$.
Alexandria, $2^h\ 00^m$ east from Greenwich; latitude, $+31°\ 12'$.

Ptolemy's descriptions of the several eclipses are as follows:—

(1)

Ων τοίνυν εἰλήφαμεν παλαιῶν τριῶν ἐκλείψεων ἐκ τῶν ἐν Βαβυλῶνι τετηρημένων, ἡ μὲν πρώτη ἀναγέγραπται γεγονυῖα τῷ πρώτῳ ἔτει Μαρδοκεμπάδου, κατ' Αἰγυπτίους Θὼθ κθ̄ εἰς τὴν λ̄. Ηρξατο δέ, φησιν, ἐκλείπειν μετὰ τὴν ἀνατολὴν, μιᾶς ὥρας ἱκανῶς παρελθούσης, καὶ ἐξέλιπεν ὅλη.

"Of the three ancient eclipses which we have taken from those observed in Babylon, the first is recorded as having occurred in the first year of Mardocempadus, according to [the reckoning of] the Egyptians on the 29th day of the month Thoth, toward the 30th. It began to be eclipsed, it is said, after its rising, when one hour had quite far passed, and the eclipse was total."

The term *ἱκανῶς παρελθούσης* seems to admit of some latitude of interpretation. Ptolemy assumes the interval to be an hour and a half, Hartwig an hour and a quarter. According to Zech, the moon rose at $5^h\ 53^m$. Ptolemy himself must be considered the best judge of the somewhat indefinite language used, and, on the other hand, the interval after moonrise was probably nearer one hour than two hours. I shall assume a mean between an hour and a quarter and an hour and a half as the most probable interval, making:—

Babylon time of observed beginning	$7^{h}\ 15^{m}$
Correction for longitude	$2^{h}\ 56^{m}$
Greenwich mean time	$4^{h}\ 19^{m}$.

The probable error of this estimate I consider to be 12 minutes, the interval of time being so short as to admit of comparatively accurate estimate.

(2)

Η δὲ δευτέρα τῶν ἐκλείψεων ἀναγέγραπται γεγονυῖα τῷ δευτέρῳ ἔτει τοῦ αὐτοῦ Μαρδοκεμπάδου κατ' Αἰγυπτίους Θὼθ ιη̅ εἰς τὴν ιθ̅. Εξέλιπε δέ, φησιν, ἀπὸ νότου δακτύλους τρεῖς αὐτοῦ τοῦ μεσονυκτίου.

"The second is recorded as having occurred in the second year of the same MARDOCEMPADUS, on the 18th of Thoth, toward the 19th. It was eclipsed from the south three digits in the middle of the night."

The indefiniteness of the time renders this eclipse of very little value for our present purposes.

The estimate of magnitude formerly served to determine the motion of the moon's node, but this can now be learned with far more accuracy from modern data So far as any indications are given, the middle of the eclipse was at midnight, a statement of which the probable error may be 40 minutes. We have, therefore:—

Greenwich apparent time of middle	$9^{h}\ 4^{m} \pm 40^{m}$
Equation of time	$+14^{m}$
Greenwich mean time	$9^{h}\ 18^{m}$.

(3)

Η δὲ τρίτη τῶν ἐκλείψεων ἀναγέγραπται γεγονυῖα τῷ αὐτῷ δευτέρῳ ἔτει τοῦ Μαρδοκεμπάδου κατ' Αἰγυπτίους Φαμενὼθ ιε̅ εἰς τὴν ις̅. Ηρξατο δέ, φησιν, ἐκλείπειν μετὰ τὴν ἀνατολὴν, καὶ ἐξέλιπεν ἀπ' ἄρκτων πλεῖον τοῦ ἡμίσους.

"The third is recorded as having occurred in the same second year of MARDOCEMPADUS, the 15th of Phamenoth, toward the 16th. It began to be eclipsed, it is said, after the rising, and was eclipsed from the north more than the half."

The moon rose, according to ZECH, at $6^{h}\ 29^{m}$ local time, or $3^{h}\ 33^{m}$ Greenwich mean time. We can only conclude, from the data as expressed, that the eclipse had not become perceptible at this time; but, on the other hand, had the interval been considerable, say one hour or more, it would probably have been described. PTOLEMY supposes the interval half an hour I shall assume it to be 25 minutes, with a probable error of 20 minutes, which will make the

Greenwich mean time	$3^{h}\ 58^{m} \pm 20^{m}$.

(4) —620, April 21.

Τῷ γὰρ πέμπτῳ ἔτει Ναβοπολασσάρου, ὅ ἐστιν ρκζ̅ον ἔτος ἀπὸ Ναβονασσάρου, κατ' Αἰγυπτίους Αθὺρ κζ̅ εἰς τὴν κη̅ ὥρας ια̅ ληγούσης, ἐν Βαβυλῶνι ἤρξατο ἡ σελήνη ἐκλείπειν, καὶ ἐξέλιπε τὸ πλεῖστον ἀπὸ νότου δ″ τῆς διαμέτρου.

"In the fifth year of NABOPOLASSAR, which is the 127th year from NABONASSAR according to the Egyptian reckoning, on the 27th of Athyr, toward the 28th, at the closing of the eleventh hour in Babylon, the moon began to be eclipsed, and was eclipsed mostly on the south a fourth of the diameter."

The time here indicated is 55 minutes before sunrise, which occurred at $17^h\ 36^m$ local apparent time, or the local mean time of beginning is $16^h\ 37^m$, the equation of time being -4^m; and the Greenwich mean time $13^h\ 41^m$. The probable error may be estimated at 15 minutes.

(5) — 522, July 16.

Πάλιν δὴ τῷ ζ̄ῳ ἔτει Καμβύσου, ὅ ἐστι σκε̄ον ἔτος ἀπὸ Ναβονασσάρου, κατ' Αἰγυπτίους Φαμενὼθ ιζ̄ εἰς τὴν ιη̄ πρὸ μιᾶς ὥρας τοῦ μεσονυκτίου, ἐν Βαβυλῶνι ἐξέλιπεν ἡ σελήνη ἀπ' ἄρκτων τὸ ἥμισυ τῆς διαμέτρου.

"In the seventh year of **CAMBYSES**, which is the 225th year from **NABONASSAR**, according to the Egyptians, on the 17th of Phamenoth, toward the 18th, one hour before midnight in Babylon, the moon was eclipsed from the north one half of her diameter."

We have then :—

Estimated local apparent time of middle of eclipse .	$11^h\ 10^m$
Equation of time	$-\ 1^m$
Greenwich mean time	$8^h\ 13^m \pm 24^m$.

A large uncertainty of phase is to be added to the probable error.

(6) — 501, November 19.

Δευτέρα δὲ, ... γενομένη τῷ κ̄ ἔτει Δαρείου τοῦ μετὰ Καμβύσην, κατ' Αἰγυπτίους Επιφὶ κη̄ εἰς τὴν κθ̄, τῆς νυκτὸς προελθούσης ἰσημερινὰς ὥρας ς̄ γ″, καθ' ἣν ὁμοίως ἐξέλιπεν ἡ σελήνη ἀπὸ νότου τὸ δ″ τῆς διαμέτρου, ...

"The second eclipse happened in the 20th year of **DARIUS**, successor of **CAMBYSES**, on the 28th of Epiphi, toward the 29th, the night having advanced 6⅓ equinoctial hours, the moon was eclipsed on the south ¼ of her diameter."

The sun set at $5^h\ 11^m$ apparent time; the equation of time being -13^m. The mean time here indicated is $11^h\ 18^m$, and the result is :—

Greenwich mean time of middle of eclipse . . . . $8^h\ 22^m \pm 25^m$.

(7) — 490, April 25.

Ελάβομεν δὴ πρώτην μὲν ἔκλειψιν τὴν ἐπὶ Δαρείου τοῦ πρώτου τετηρημένην ἐν Βαβυλῶνι τῷ πρώτῳ καὶ τριακοστῷ αὐτοῦ ἔτει, κατ' Αἰγυπτίους Τυβί γ̄ εἰς τὴν δ̄, ὥρας ς̄ μέσης, καθ' ἣν διασαφεῖται ὅτι ἐξέλειπεν ἡ σελήνη ἀπὸ νότου δακτύλους β̄.

"We have taken an eclipse observed in the time of **DARIUS** the first in Babylon, in his 31st year, on the 3d, toward the 4th of Tybi, in which it is shown that in the middle of the sixth hour the moon was eclipsed two digits on the south."

The local apparent time here indicated is $11^h\ 28^m$, the equation of time -5^m, the Greenwich mean time $8^h\ 27^m$; probable error, 25 minutes.

(8) — 382, December 22.

. . . . γεγονέναι δὲ τὴν πρώτην ἄρχοντος Ἀθήνησι Φανοστράτου, μηνὸς Ποσειδεῶνος, καὶ ἐκλελοιπέναι τὴν σελήνην βραχὺ μέρος τοῦ κύκλου, ἀπὸ θερινῆς ἀνατολῆς, τῆς νυκτὸς λοιποῦ ὄντος ἡμιωρίου. Καὶ ἔτι, φησὶν, ἐκλείπουσα ἔδυ.

"**PHANOSTRATES** being archon at Athens, the moon was eclipsed at Babylon in a small part of her orb, on the side of the summer rising, when one half hour of the night was still remaining, and the moon was still eclipsed when it set."

The first time here indicated is 36 minutes before sunrise, or $18^h\ 28^m$ local apparent time, and $18^h\ 31^m$ mean time. We have, therefore:—

Greenwich mean time of a small eclipse	$15^h\ 35^m \pm 10^m$.

(9) —381, June 18.

Πάλιν τὴν ἑξῆς ἔκλειψίν φησι γεγονέναι ἄρχοντος Ἀθήνησι Φανοστράτου, Σκιροφοριῶνος μηνὸς, κατ᾽ Αἰγυπτίους δὲ Φαμενὼθ κδ̄ εἰς τὴν κε̄. Ἐξέλιπε δέ φησιν ἀπὸ θερινῆς ἀνατολῆς τῆς πρώτης ὥρας προεληλυθυίας. . . . Ἀλλ᾽ ἐπεὶ ὁ πᾶς χρόνος τῆς ἐκλείψεως ὡρῶν τριῶν ἀναγράφεται, ...

"Phanostrates being archon at Athens, on the 24th of Phamenoth, toward the 25th, it was said to be eclipsed on summer rising [at Babylon], the first hour being passed. The whole duration of the eclipse is recorded as three hours."

The date is —381, June 18. The sun set at $7^h\ 3^m$ apparent time, or $6^h\ 57^m$ mean time. The interval mentioned may be roughly estimated as something more than one equinoctial hour, say 1 hour and 7 minutes, with a probable error of 10 minutes.

We have, therefore:—

Local mean time [of beginning (?)]	$8^h\ 4^m$
Greenwich mean time [of beginning (?)]	$5^h\ 8^m$
Greenwich mean time of end	$8^h\ 8^m$.

(10) —381, December 12, Babylon.

Ἐξέλιπε δέ, φησιν, ὅλη ἀρξαμένη ἀπὸ θερινῶν ἀνατολῶν δ̄ ὡρῶν παρεληλυθυιῶν.

"It was said to be totally eclipsed, having begun on the summer rising, four hours having gone by."

The sun's semi-diurnal arc at Babylon was $5^h\ 5^m$, the length of the temporary hour was nearly $1^h\ 10^m$, the four temporary hours would have been nearly 4 hours 40 minutes; and as they had already passed, we may estimate the probable time at $4^h\ 50^m$ after sunset, with a probable error of 24 minutes. The equation of time being -3^m, we have:—

Local mean time of beginning	$9^h\ 52^m$
Greenwich mean time of beginning	$6^h\ 56^m$.

(11) —200, September 22.

. . . . καθ᾽ ἣν ἤρξατο μὲν ἐκλείπειν ἡ σελήνη πρὸ ἡμιωρίου τῆς ἀνατολῆς, ἔσχατον δὲ ἀνεπληρώθη τρίτης ὥρας μέσης.

"The moon began to be eclipsed, on the one hand, half an hour before the rising, but was filled up again in the middle of the third hour."

If Hipparchus is here fully and correctly quoted, which is very doubtful, he must have had a very indefinite idea of the difference between a calculated and an observed phenomenon, speaking as he does of an eclipse commencing half an hour before it was possible for the moon to be seen. Still, as the half hour is probably the result of an estimate from the magnitude of the eclipse at the time the moon first became visible, it is not without value. The moon rose at $6^h\ 0^m$ apparent time, which was $5^h\ 53^m$ mean time. The middle of the third hour was about $8^h\ 32^m$ apparent time, or $8^h\ 25^m$ mean time, making the Greenwich mean time of ending $6^h\ 25^m \pm 12^m$.

(12) — 199, March 19, Alexandria.

Ηρξατο δὲ τῆς νυκτὸς προελθουσῶν ὡρῶν ε̄ καὶ τριτημορίου, καὶ ἐξέλιπεν ὅλη.

"It began when 5⅓ hours of the night were passed, and it was total."

This is $11^h\ 19^m$ apparent time, $11^h\ 29^m$ local mean time, and $9^h\ 29^m$ Greenwich mean time.

(13) — 199, September 11, Alexandria.

Ηρξατο δὲ τῆς νυκτὸς προελθουσῶν ὡρῶν ς̄ γ″ₒ, καὶ ἐξέλιπεν ὅλη. Καὶ τὸν μέσον δὲ τῆς ἐκλείψεως χρόνον φησὶ γεγονέναι περὶ ὥρας μάλιστα η̄ καὶ τριτημόριον,

. . . . . .

"It began 6⅔ hours of the night having passed, and it was total, and the middle of the eclipse arrived, he says about 8⅓ hours of the night."

Here we have again, in the "middle of the eclipse", a time given which it was impossible to observe, without any indication of the data from which the time was derived. As the eclipse was total, the most natural data would have been the observed times of beginning and end of totality, which would be far more accurate than the observed times of beginning and ending of the partial phase. The times indicated are:—

Local apparent times	$12^h\ 41^m$ and $14^h\ 25^m$
Local mean times	$12^h\ 38^m$ and $14^h\ 22^m$
Greenwich mean times	$10^h\ 38^m$ and $12^h\ 22^m$.

(14) — 173, April 30, Alexandria.

Τῷ τοίνυν ζ̄ῳ ἔτει Φιλομήτορος, ὅ ἐστι φοδ̄ον ἀπὸ Ναβονασσάρου, κατ᾽ Αἰγυπτίους Φαμενὼθ κζ̄ εἰς τὴν κη̄, ἀπὸ ὥρας η̄ ἀρχομένης ἕως ῑ ληγούσης, ἐν Αλεξανδρείᾳ ἐξέλιπεν ἡ σελήνη τὸ πλεῖστον ἀπ᾽ ἄρκτων δακτύλους ζ̄.

"In the 7th year of Philometer, which is the 574th from Nabonassar, on the 27th of Phamenoth, toward the 28th, the moon was eclipsed in Alexandria from the beginning of the eighth hour to the close of the tenth, mostly on the north, seven digits."

These times are:—

Local apparent times	$12^h\ 54^m$ and $15^h\ 37^m$
Local mean times	$12^h\ 48^m$ and $15^h\ 31^m$
Greenwich mean times	$10^h\ 48^m$ and $13^h\ 31^m$.

(15) — 140, January 27, Rhodes.

Πάλιν δὴ τῷ λζ̄ῳ ἔτει τῆς τρίτης κατὰ Κάλιππον περιόδου, ὅ ἐστιν χζ̄ ἀπὸ Ναβονασσάρου, κατ᾽ Αἰγυπτίους Τυβὶ β̄ εἰς τὴν γ̄, ὥρας ε̄ ἀρχομένης, ἐν Ρόδῳ ἤρξατο ἐκλείπειν ἡ σελήνη καὶ ἐπεσκοτήθη τὸ πλεῖστον ἀπὸ νότου δακτύλους γ̄.

". . . the 607th year from Nabonassar [Egyptian reckoning], the second of Tybi, toward the third, at the beginning of the 5th hour in Rhodes, the moon began to be eclipsed, and was obscured, mostly on the south, three digits."

This is $9^h\ 42^m$ local apparent time, $10^h\ 0^m$ mean time, and $8^h\ 7^m$ Greenwich mean time.

(16) 125, April 5, Alexandria.

Δευτέραν δὲ τὴν τετηρημένην ἐν Ἀλεξανδρείᾳ, τῷ θ̅ ἔτει Ἀδριανοῦ, κατ᾽ Αἰγυπτίους Παχὼν ιζ̅ εἰς τὴν ιη̅, πρὸ τριῶν ὡρῶν ἰσημερινῶν καὶ τριῶν πέμπτων μιᾶς ὥρας τοῦ μεσονυκτίου, καθ᾽ ἣν ὁμοίως ἐξέλειπεν ἡ σελήνη τὸ ἕκτον μέρος τῆς διαμέτρου ἀπὸ μεσημβρίας.

"On the 17th of Pachon, toward the 18th, $3\frac{3}{5}$ equinoctial hours before midnight, the moon was eclipsed the sixth part of her diameter on the south."

This is 8^{h} 24^{m} apparent time, 8^{h} 26^{m} mean time, and 6^{h} 26^{m} Greenwich mean time.

(17) 133, May 6, Alexandria.

Πάλιν ὧν εἰλήφαμεν τριῶν ἐκλείψεων ἐκ τῶν ἐπιμελέστατα ἡμῖν ἐν Ἀλεξανδρείᾳ τετηρημένων, ἡ μὲν πρώτη γέγονε τῷ ιζ̅ ἔτει Ἀδριανοῦ, κατ᾽ Αἰγυπτίους Παϋνὶ κ̅ εἰς τὴν κα̅. Τὸν δὲ μέσον χρόνον ἀκριβῶς ἐπελογισάμεθα γεγονέναι πρὸ ἡμίσους καὶ τετάρτου μιᾶς ὥρας ἰσημερινῆς τοῦ μεσονυκτίου· καὶ ἐξέλιπεν ὅλη, καθ᾽ ἣν ὥραν ἀκριβῶς ἐπεῖχεν ὁ ἥλιος τοῦ ταύρου μοίρας ιγ̅ δ″ ἔγγιστα.

"Of the three eclipses which we have taken from those very carefully observed by us in Alexandria, the first occurred in the 77th year of HADRIAN, on the 20th of Payni, toward the 21st. We accurately noted the mid-time to have been one half and one fourth of an equinoctial hour before midnight, and it was wholly eclipsed."

The apparent precision with which the time is here expressed tends to inspire confidence, although we still have no data respecting the manner in which it was determined. The apparent time being 11^{h} 15^{m}, the local mean time is 11^{h} 8^{m}, the Greenwich mean time 9^{h} 8^{m}.

(18) 134, October 20, Alexandria.

Η δὲ δευτέρα γέγονε τῷ ιθ̅ ἔτει Ἀδριανοῦ κατ᾽ Αἰγυπτίους Χοϊάκ β̅ εἰς τὴν γ̅. Τὸν δὲ μέσον χρόνον ἐπελογισάμεθα γεγονέναι πρὸ α̅ ὥρας ἰσημερινῆς τοῦ μεσονυκτίου.

"The second occurred in the 19th year of HADRIAN, the 2d of Choïac toward the 3d: the mid-time we noted to have been one equinoctial hour before midnight, and it was eclipsed on the north one third of the diameter."

11^{h} apparent time is here 10^{h} 46^{m} mean time, and 8^{h} 46^{m} Greenwich mean time.

(19) 136, March 5, Alexandria.

Η δὲ τρίτη τῶν ἐκλείψεων γέγονε τῷ κ̅ ἔτει Ἀδριανοῦ κατ᾽ Αἰγυπτίους Φαρμουθὶ ιθ̅ εἰς τὴν κ̅. Τὸν δὲ μέσον χρόνον ἐπελογισάμεθα γεγονέναι μετὰ δ̅ ὥρας ἰσημερινὰς τοῦ μεσονυκτίου· καὶ ἐξέλιπε τὸ ἥμισυ τῆς διαμέτρου ἀπ᾽ ἄρκτων.

"The third eclipse happened in the 20th year of HADRIAN, on the 19th of Pharmouthi, toward the 20th: the mid-time we noted to have been four equinoctial hours after midnight, and it was eclipsed the half of its diameter on the north."

16^{h} apparent time was then 16^{h} 14^{m} mean time, and 14^{h} 14^{m} Greenwich mean time.

This completes the series as given by Ptolemy. The tabular positions of the sun and moon derived from Hansen's tables for epochs of Greenwich mean time near the observed phases are shown in the following table. These places have all been computed in duplicate, the two computations being made by two separate computers. The motions in longitude are for 0.01 of a day, as the tables most conveniently give them. The motion in latitude is supposed to be $\frac{1}{11}$ that in longitude, positive at the ascending and negative at the descending node. The node can be identified by the value of $f + \omega$, which is the angular distance of the moon past the ascending node.

It may be remarked that the probable error of the longitude arising from the omission of the terms in the tables of double entry is about $24''$.

Tabular Data for Eclipses of the Almagest.

No. of Eclipse.	Date.	Gr. M. T. of Computation.	Moon's Longitude.	$14.4\,l'$ Motion in $0^d.01$.	π Parallax.	β Latitude.	$f+\omega$	λ ☉'s Long. (Hansen).	☉'s Semidiam.	$14.4\,\lambda'$ Motion in $0^d.01$.
		h m	° ′	′	′	° ′	°	° ′	′ ″	′
1	− 720, Mar. 19	5 0	170 59.3	7.57	55.7	+ 0 3.6	0.5	351 31.5	15 57	0.60
2	− 719, Mar. 8	8 0	160 30.4	7.10	53.9	+ 0 46.7	8.8	340 41.8	16 0	0.60
3	− 719, Sept. 1	3 0	329 55.4	9.08	61.2	− 0 37.8	187.6	150 54.4	16 0	0.58
4	− 620, Apr. 21	13 0	204 16.2	7.11	54.0	+ 0 52.8	169.8	24 23.6	15 49	0.59
5	− 522, July 16	8 0	286 37.2	7.18	54.2	− 0 40.9	352.2	106 33.2	15 48	0.57
6	− 501, Nov. 19	8 0	51 46.8	7.08	53.8	+ 0 50.7	170.2	231 54.2	16 16	0.60
7	− 490, Apr. 25	7 0	207 55.8	8.13	57.8	+ 1 1.6	168.1	28 31.4	15 49	0.59
8	− 382, Dec. 22	16 0	86 46.9	8.72	59.9	− 0 57.8	348.7	267 2.0	16 17	0.61
9	− 381, June 18	4 0	259 47.0	7.17	54.2	+ 0 46.5	171.2	80 27.8	15 45	0.57
10	− 381, Dec. 12	6 0	75 12.8	9.14	61.3	− 0 21.2	356.0	256 9.9	16 17	0.61
11	− 200, Sept. 22	5 0	356 20.4	7.48	55.4	+ 0 33.4	173.8	176 0.7	16 4	0.59
12	− 199, Mar. 19	8 0	173 56.4	8.28	58.3	+ 0 4.9	0.9	355 22.4	15 58	0.59
13	− 199, Sept. 11	10 0	343 55.1	8.33	58.5	+ 0 0.1	180.2	165 1.7	16 1	0.58
14	− 173, Apr. 30	10 0	214 45.9	9.07	61.1	− 0 35.7	186.8	35 40.1	15 49	0.57
15	− 140, Jan. 27	6 0	123 26.4	9.14	61.3	+ 0 46.6	8.9	304 31.9	16 12	0.60
16	+ 125, Apr. 5	6 0	194 2.6	8.31	58.4	+ 0 57.4	168.8	14 16.2	15 54	0.59
17	+ 133, May 6	8 0	223 56.1	7.33	54.8	− 0 25.7	355.1	44 11.5	15 48	0.58
18	+ 134, Oct. 20	8 0	25 54.9	7.56	55.7	− 0 26.8	185.2	206 15.1	16 11	0.60
19	+ 136, Mar. 5	12 0	163 51.8	8.89	60.5	− 0 53.2	349.7	344 36.9	16 2	0.60

Owing to the somewhat indefinite character of the data given by Ptolemy, it will assist the judgment to present both his statements and the tabular results in a form in which they can be best compared. This is done in the following table, from which the reader can obtain a clear view of the comparison. The deduction of the numbers in the third and fourth columns has been given with the separate descriptions of the eclipses. They therefore need only these two remarks: (1) that the probable errors are the result of judgment from the terms of the description rather than of calculation; (2) that they were estimated without any knowledge of the way the comparison with theory would come out, and are printed without subsequent alteration.

In the column of "Phase described", Δ means magnitude of the eclipse. The tabular time of geometrical phase gives the time of beginning, middle, or end, as the case may be. The quantities Δ_1 and Δ_2 in the last column represent respectively the number of minutes a central eclipse may be supposed to have advanced before the observers would see it, and the number of minutes before the end that the observers lost sight of it. From eclipses (9), (13), and (14), the only ones of which both beginning and end were observed, $\Delta_1 + \Delta_2$ comes out -10^{m}. But they must both be positive, and this result only indicates that they are very small. I shall put conjecturally

$$\Delta_1 = 3^{\mathrm{m}}$$
$$\Delta_2 = 2^{\mathrm{m}}.$$

No. of Eclipse.	Date.	Greenwich Mean Time, indicated by PTOLEMY.	Prob. Error.	Phase described by PTOLEMY.	Tabular Duration.	Tabular Time of Geomet. Phase.	Corr. to Tabular Time.
		h *m*	*m*		*h*	*h* *m*	*m*
1	− 720, Mar. 19	4 19	12	Beginning .	3.8	4 11	$+8-1.0\Delta$
2	− 719, Mar. 8	9 18	40	Middle (?) .	1.9	8 15	$+63$
3	− 719, Sept. 1	3 58	20	Beginning .	2.4	3 15	$+43-1.5\Delta_1$
4	− 620, Apr. 21	13 41	15	Beginning .	1.0	12 57	$+44-3.8\Delta_1$
5	− 522, July 16	8 13	24	Middle (?) $\Delta=\frac{1}{2}$	2.6	8 0	$+13$
6	− 501, Nov. 19	8 22	24	Middle (?) $\Delta=\frac{1}{4}$	1.1	8 27	-5
7	− 490, Apr. 25	8 27	24	Middle (?) $\Delta=\frac{2}{12}$	0.6	8 17	$+10$
8	− 382, Dec. 22	15 35	10	Small eclipse (commenc'g).	1.6	15 52	$-17-2.2\Delta_1$
9	− 381, June 18	5 8	12	Beginning .	2.4	4 25	$+43-1.5\Delta_1$
		8 8	20	End . . .	2.4	6 51	$+77+1.5\Delta_2$
10	− 381, Dec. 12	5 56	24	Beginning .	3.4	5 57	$+59-1.1\Delta_1$
11	− 200, Sept. 22	3 23	30	Begin. (est.).	3.0	2 57	$+26$
		6 25	12	End . . .	. .	5 55	$+30+1.5\Delta_2$
12	− 199, Mar. 19	9 29	15	Beginning .	3.6	8 51	$+38-1.0\Delta_1$
13	− 199, Sept. 11	10 38	18	Beginning .	3.6	10 13	$+25-1.0\Delta_1$
		12 22	20	Middle . .	. .	12 3	$+19$
14	− 173, Apr. 30	10 48	20	Beginning .	2.7	10 4	$+44-1.4\Delta_1$
		13 31	20	End . . .	. .	12 45	$+46+1.4\Delta_2$
15*	− 140, Jan. 27	8 7	20	Beginning .	1.9	6 44	$+83-2.0\Delta_1$
16	+ 125, Apr. 5	6 26	18	Middle (?) $\Delta=\frac{1}{6}$	1.2	6 36	-10
17	+ 133, May 6	9 8	12	Middle . .	3.5	8 38	$+30$
18	+ 134, Oct. 20	8 46	15	Middle . .	3.3	8 33	$+13$
19	+ 136, Mar. 5	14 14	15	Middle . .	2.2	13 26	$+48$

We shall now consider, seriatim, the conclusions that we may draw from the comparison.

1. The discordances of the times in the last column are, on the whole, not materially greater than would result from the probable errors in the fourth column. We therefore conclude that the probable errors have not been underestimated to any great extent.

2. There are five eclipses, namely, Nos. (2), (5), (6), (7), and (16), in which the phase is not expressly stated by PTOLEMY, but in which the middle of the eclipse has hitherto been supposed to be referred to. But, in the case of at least the last three, the tabular comparisons give color to the suspicion that it was really the time of beginning which was noted; and this suspicion is strengthened by the consideration that it was the time of beginning which was generally noted by the predecessors of

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* ZECH supposes an error of an hour in the time of this eclipse. The alteration does not seem to me justified by the discordance of two and a half times the probable error.

Ptolemy. I therefore deem it advisable to reject these five eclipses, owing to the uncertainty of the phase noted. Quite accordant results might be obtained by supposing that the beginning was observed in some cases and the end in others; but the uncertainty is too great to justify this course.

3. The question whether eclipse No. (8) was really seen is a very serious one. When we take out the five doubtful eclipses and this one, seventeen observations of phase are left, every one of which indicates a positive correction to the tabular time; and the results throughout the nine centuries over which the records extend are so accordant that I do not see how the reality of this correction can be doubted. The serious point is not simply that No. (8) gives a negative result, for this might arise from accidental errors of observation, but that a positive correction to the time will render the eclipse absolutely invisible at Babylon. In fact, the account says that there was a small eclipse (not simply that the eclipse was beginning) half an hour before sunrise. At this time, however, the twilight would have been so bright and the altitude of the moon so low that the eclipse could not be seen for a number of minutes after its commencement. On the other hand, the tabular time indicates that the eclipse did not commence geometrically until about nineteen minutes before sunrise; and, in this case, the eclipse could scarcely have been seen at all, because the constantly increasing light and the constantly diminishing altitude of the moon would have drowned out the slowly increasing eclipse. In fact, when the sun rose, the moon would have been eclipsed only about 3′, or one tenth of her diameter. If, again, we take the tabular correction indicated by the other eclipses, we find that the eclipse did not begin until some time after the moon had set.

We have therefore this dilemma: either there is a mistake about the eclipse of −382, December 22, having been really observed at Babylon, or the seventeen good observations of phases cited by Ptolemy are systematically in error by nearly half an hour. I cannot hesitate in accepting the former as the most probable alternative. The occurrence of the eclipse being expected, it is quite possible that the observers may have thought they saw the moon eclipsed in the increasing daylight, when there was really no eclipse; or, under the unfavorable circumstances, they might have been deceived by a dark region of the lunar disk being near the moon's limb. Nor can a mistake of date be regarded as out of the question. On the whole, I think that this eclipse should be rejected, since, if we regard it as a real observation, the results from the other eclipses must be regarded as all wrong.

We have left thirteen eclipses, of four of which two phases, beginning and end, were observed or estimated. We next divide these into groups, and take the mean by weights, derived approximately from the probable errors in the fourth column.

From eclipses (1), (3), and (4), giving them the respective weights 3, 1, and 2, we find:—

$$\text{Epoch } -687, \quad \varDelta T = +26^{m} - 2.0\,\varDelta_1 = +20^{m} \pm 8^{m}.$$

From (9) and (10), with the weights 8, 3, and 2, we find:—

$$\text{Epoch } -381, \quad \varDelta T = +53^{m} - 1.1\,\varDelta_1 + 0.3\,\varDelta_2 = 50^{m} \pm 9^{m}.$$

From (11) to (15) inclusive, giving the phases weights 1, 6, 4, 3, 2, 2, 2, 2:—

$$\text{Epoch } -189, \quad \varDelta T = +37^{m} - 0.6\,\varDelta_1 + 0.6\,\varDelta_2 = +36^{m} \pm 6^{m}.$$

From (17) to 19), giving the weights 3, 2, 2:—

$$\text{Epoch} + 134, \Delta T = + 30^{m} \pm 8^{m}.$$

If we reduce these results to minutes of arc, we find the following corrections to the moon's mean longitude, as derived from HANSEN's Tables:—

Epoch.	$\delta\varepsilon$.	Wt.
-687	$-11' \pm 4'$	3
-381	$-27' \pm 5'$	2
-189	$-20' \pm 3'$	4
$+134$	$-16' \pm 4'$	3

In the light of these comparisons with theory, we could no doubt amend some of our interpretations of the times given by PTOLEMY. PTOLEMY's interpretation of the description of the first eclipse would seem to be more correct than the one adopted, while, in the case of eclipse (9), it was an error to suppose that much more than an hour had passed. But, although, by thus amending the interpretations, a better agreement would be attained among the observations, I do not think the final result would be improved, and it certainly would not be materially altered. I think we may conclude, with a high degree of probability, that during the eight centuries preceding the Christian era the mean longitude of the moon in HANSEN's Tables requires a correction of about + 18'.*

§ 5.

ARABIAN OBSERVATIONS OF ECLIPSES, EXTRACTED FROM CAUSSIN'S TRANSLATION OF EBN JOUNIS.

The complete French title of this work is, "*Le Livre de la grande Table Hakémite observée par le Sheikh, l'Imam, le docte, le savant Aboulhassan Ali ebn Abderrahman, ebn Ahmed, ebn Jounis, ebn Abdalaala, ebn Mousa, ebn Maïsara, ebn Hafes, ebn Hiyan. Traduit par le C.en* CAUSSIN, *professeur de la langue Arabe au Collège de France.* A Paris, de l'imprimerie de la République. An xii. [1804, v. s.]."

Most of the observations which will be quoted were also published, before the appearance of the book, in the Memoirs of the Paris Academy of Sciences, vol. 2; and there are a few discrepancies between the results there given and those in the extended work. I shall, however, use the latter as my authority.

The ideas of the author respecting the errors of instruments seem to have been far ahead of his age, if we may judge from the following description of the precautions which must be taken to obtain good observations. Unfortunately, only a fraction of the observations could have been made by this most critical observer, who died in 1008.

"*De l'Erreur des Instrumens qui servent à mesurer.*

"L'art ne pouvant atteindre, dans la fabrication des instrumens, la justesse qui conçoit l'esprit de l'artiste, soit pour égaliser leur surfaces, soit pour les diviser et les centrer avec précision, il faut nécessairement qu'ils soient sujets à des erreurs provenant de quelqu'une de ces causes ou de leur situation par rapport à l'horizon. S'il y a une construction, elle est sujet à des dévers ou apparens ou insensibles; si les instrumens sont de bois, le bois se gauchit, sur-tout s'il est fixé dans un lieu exposé au soleil et à l'humidité. Il y aura toujours d'autant moins d'erreurs dans les instrumens, qu'ils auront été construits par un homme plus instruit, plus habile et plus attentif. A ce que je viens de dire, il faut ajouter, dans l'observateur, l'habitude d'observer, de placer d'aplomb, la justesse de l'aplomb lui-même, &c. S'imaginer que chacun est en état de prendre toute espèce de mesure sans en avoir l'habitude, et que tous les instrumens donnent des résultats sûrs, c'est être dans l'erreur. Celui qui veut faire de bonnes observations, doit s'appliquer long-temps à connoître les instrumens et s'accoutumer à s'en servir."

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* Since reaching this conclusion, I have been strongly inclined to think that the phases recorded should be considered as geometrical contacts, and therefore that Δ_1 and Δ_2 should both be regarded as zero. This change would make the results slightly more consistent, and would increase the tabular correction from the first group of observations. I have not, however, considered it advisable to introduce it.

The geographical position of Bagdad does not seem to be very well determined, but the observations with which we have to deal are so rough that the probable error is not of importance in the present investigation. The latest determinations I can find are in the *Connaissance des Temps* for 1836, *Additions*, p. 138, where the latitude, 33° 19′ 50″, is taken from a paper by BEAUCHAMP in ZACH'S *Monatliche Correspondenz*, vol. i, and the longitude is taken from a note to the same paper. The following appear to be the results of the separate determinations:—

Conn. des Temps for 1788 . . .	$\lambda = 2^h\ 48^m\ 18^s$	Source unknown.
BEAUCHAMP, *Mon. Corr.*, vol. i, p. 65	$2^h\ 48^m\ 9^s$	Eclipse Jup. III. Sat.
BEAUCHAMP, *Mon. Corr.*, vol. i, p. 65	$2^h\ 47^m\ 38^s$	Eclipse Jup. I. Sat.
TRIESNECKER, *Mon. Corr.*, vol. i, p. 65	$2^h\ 48^m\ 9^s$	Eclipse ☉, June 3, 1788.

These longitudes are counted from Paris. I have adopted the last result, which is that employed in the recent volumes of the *Connaissance des Temps*, assuming

Latitude of Bagdad	33° 20′
Longitude east of Greenwich	$2^h\ 57^m\ 30^s$.

The longitude may be considered as subject to a probable error of ten or fifteen seconds, which is not of importance at present.

The position of Cairo is also taken from recent numbers of the *Connaissance des Temps*, as follows:—

Latitude	30° 2′
Longitude from Paris	$1^h\ 55^m\ 41^s$;

whence,

Longitude from Greenwich	$2^h\ 5^m\ 2^s$.

We shall first copy the descriptions of the observations from the work in question, and then present the results in a tabular form as far as possible. Eclipses in which the data are entirely insufficient will be passed over in silence.

(1) Page 84.—"*Éclipse de soleil observée à Bagdad le* 30 [29] *novembre* 829. Hauteur du soleil au commencement, selon le rapport des astronomes, 7°; hauteur à la fin, 24°, sur les trois heures du jour environ."

The local mean times hence deduced are:—

Beginning . . . . $19^h\ 33^m\ 44^s$
End . . . . $21^h\ 24^m\ 24^s$.

(2) Page 88.—"*Éclipse de lune observée à Bagdad le* 12 [11] *août* 854. On observa au commencement de l'éclipse, la hauteur d'Aldébaran de 45° 30′ à l'orient: on n'observa point d'autre instant ni d'autre circonstance de cette éclipse que l'instant du commencement, qui est exact et précis."

Result: Local mean time of beginning . . . . $14^h\ 58^m\ 37^s$.

(3) Page 90.—"*Éclipse de lune observée à Bagdad le* 22 [21] *juin* 856. On observa au commencement de l'éclipse la hauteur d'Aldebaran de 9° 30′ à l'orient."

Result: Local mean time of beginning . . . . $15^h\ 19^m\ 28^s$.

(4) Page 112.—"*Éclipse de lune observée à Bagdad le* 1 *juin* 923. * * la fin à 3^h, heures égales; hauteur de l'étoile près de la queue du Cygne [α Cygni], 29° 30′ à l'orient."

Result: Mean time of end . . . . $9^h\ 54^m\ 3^s$.

(5) Page 114.—"*Éclipse de soleil observée à Bagdad le* 11 [10] *novembre* 923. Nous nous réunîmes plusieurs pour l'observer et nous distinguâmes clairement ses circonstances. Hauteur du soleil au milieu de l'éclipse déterminée d'après l'estime de tous les observateurs, 8° orient; la fin à $2^h\ 12^m$, heures inégales; la hauteur alors de 20°."

Result: Local mean time of middle . . . . $19^h\ 19^m\ 38^s$
Local mean time of end . . . . $20^h\ 30^m\ 2^s$.

Of course, the first observation can have no astronomical value.

(6) Page 116.—"*Éclipse de lune observée à Bagdad le* 11 *avril* 925. J'ai observai cette éclipse et j'ai trouvé au commencement la hauteur d'Arcturus de 11° à l'orient; hauteur de l'étoile Wega, à la fin, 24°. Le commencement, d'après cette observation, arriva à 55′, heures inégales, de la nuit; * * la fin, selon l'observation, $4^h\ 36^m$, heures inégales."

Result: Mean time of beginning . . . . $5^h\ 36^m\ 6^s$
Mean time of end . . . . $10^h\ 45^m\ 19^s$.

There is clearly an error in the statement that the altitude of Arcturus was 11° at the beginning of the eclipse; it must have been 30° or upward. I cannot see that any other bright star could have had an altitude of 11° at the time in question, while Arcturus was far the most prominent star in the east. It, therefore, seems probable that the altitude is incorrectly given. We shall, therefore, endeavor to deduce the time from the results of the Arabian calculations, checking the latter by comparison with our own. The sun was in about 10° north declination; the geometrical setting of his centre, therefore, occurred at $6^h\ 26^m$ apparent time, or $6^h\ 25^m$ mean time, and each temporary hour measured about $55^m.7$. The interval given by the Arabians corresponds to 4^h 16^m.2 mean time, making their computed time of ending 10^h 41^m.2, showing an error of four minutes, which would be diminished if we suppose that they applied semidiameter and refraction in computing the time of sunset. (It will be noted that we here have to do with a computed, and not with an observed, sunset.) Now, for the beginning of the eclipse, 55′ corresponds to 51^m.0 of mean time, making their computed time of beginning 7^h 16^m.0. Applying the correction of 4.^{m}1, we have:—

Probable mean time of beginning . . . . 7^h 20^m.1.

This result will be subject to an error, arising from the error in the relative positions of Arcturus and *α* Lyræ adopted by the Arabians. The probable amount of this error will not, I conceive, exceed two or three minutes of time.

(7) Page 118.—"*Éclipse de lune observée à Bagdad le* 14 [13] *septembre* 927. Le commencement à 10^h 14^m de la nuit de vendredi, le milieu à 11^h 21^m, la fin à 9^m du jour de vendredi, le tout en heures inégales. Cet éclipse, dit-il, fut observée par mon fils Aboulhassan. Hauteur de Sirius au commencement, 31° à l'orient; révolution de la sphère depuis le coucher du soleil jusqu'au commencement de l'éclipse, déterminée avec l'astrolabe, 148° environ."

From what follows, it appears that the times given are those computed from the tables. From the altitude of Sirius we have:—

Local mean time of beginning . . . . 15^h 48^m 16^s.

The observation with the astrolabe gives a result only one or two minutes later.

(8) Page 120.—"*Éclipse de soleil observée à Bagdad le* 18 [17] *août* 928. Le soleil se leva éclipsé d'un peu moins du quart de sa surface. * * * Nous observâmes le soleil dans l'eau d'une manière sûre et distincte. Nous trouvâmes à la fin lorsqu'aucune partie du soleil n'étoit plus éclipsée, et que son disque paroissoit entier dans l'eau, la hauteur de 12° à l'orient, moins le tiers d'une division de l'instrument divisé par tiers de degré, ce qui fait retrancher $\frac{1}{9}$ de degré. (Hauteur, 11° 53′ 20″.)"

Result: Mean time of end . . . . 18^h 26^m 59^s.

(9) Page 122.—"*Éclipse de lune observée à Bagdad le* 27 *janvier* 929. J'ai observé, dit-il, le commencement de cette éclipse. La hauteur d'Arcturus étoit alors 18° à l'orient."

Result: Local mean time of beginning . . . . 11^h 3^m 2^s.

(10) Page 124.—"*Éclipse de lune observée à Bagdad le* 5 [4] *novembre* 933. J'ai observé, dit-il, cette éclipse lorsque la lune commença à s'obscurcir. La hauteur d'Arcturus étoit alors 15° à l'orient."

Result: Local mean time . . . . 16^h 15^m 15^s.

The remaining eclipses were observed at Cairo.

(11) Page 164.—"*Éclipse de soleil observée au Caire le* 12 *décembre* 977. Chacun attendoit le commencement de l'éclipse; elle parut sensible à la vue lorsque la hauteur

du soleil étoit entre 15 et 16 degrés. * * * Le soleil parut reprendre toute sa clarté; et je trouva sa hauteur 33° 20′ environ, chacun étant d'accord de la fin de l'éclipse."

Result: The eclipse sensible to the view . . . . $20^h\ 24^m\ 4^s$
No longer visible . . . . $22^h\ 41^m\ 12^s$.

(12) Page 166.—"*Éclipse de soleil observée au Caire le* 8 *juin* 978. Hauteur du soleil, lorsque l'éclipse commença à être sensible aux yeux, 56° environ; hauteur à la fin, 26° environ."

Result: The eclipse sensible to the view . . . . . . $2^h\ 27^m\ 31^s$
The eclipse ended . . . . $4^h\ 47^m\ 15^s$.

(13) Page 168.—"*Éclipse de lune observée au Caire le* 14 *mai* 979. La fin de l'éclipse à une heure 12′ de la nuit, heures égales."

Here we have to accept the results of the Arabian astronomer without any of the data by which he determined his time.* The geometrical setting of the sun's centre was at $6^h\ 49^m$ apparent time, and $6^h\ 43^m$ mean time If we allow 2 minutes for refraction, it will make the mean time of commencement $7^h\ 57^m$, a result which is uncertain by several minutes.

(14) Page 168.—"*Éclipse de soleil observée au Caire le* 28 *mai* 979. Hauteur du soleil lorsque l'éclipse fut sensible à la vue, 6° 30′. Le soleil se coucha éclipsé."

Result: The eclipse sensible to the sight . . . . $6^h\ 18^m\ 0^s$.

(15) Page 168.—"*Éclipse de lune observée au Caire le* 7 [6] *novembre* 979. Hauteur au commencement, 64° 30′ orient; hauteur à la fin, 65° occident, environ."

Result, supposing the altitudes to be those of the moon, which is not distinctly stated:—

Beginning . . . . $10^h\ 9^m\ 50^s$
End . . . . $13^h\ 22^m\ 46^s$.

(16) Page 170.—"*Éclipse totale de lune observée au Caire le* 3 [2] *mai* 980. Hauteur de la lune au commencement, 47° 40′; la fin, 36′ environ, heures égales, avant la fin de la nuit."

This altitude of the moon assigned by the observation exceeds the actual meridian altitude, so that there is some mistake which prevents the beginning being used. For the end we have:—

Apparent time of sunrise, ☉'s declination being 17°.0 .	$17^h\ 19^m.4$
The interval as given by the Arabs	$-\ 36^m.0$
Equation of time	$-\ 5^m.3$
Longitude	$-\ 2^h\ 5^m.0$
Greenwich mean time of ending	$14^h\ 33^m.1$.

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*After completing the discussion of these eclipses, I am inclined to suspect that this may be a calculated and not an observed time. As the result would not be appreciably altered by the suppression of the observation, I have let the eclipse remain.

(17) Page 170.—"*Éclipse de lune observée au Caire le* 22 [21] *avril* 981. Hauteur de la lune au commencement, 21° environ; grandeur, le quart du diamètre environ; fin de l'éclipse, un quart d'heure environ avant le lever du soleil."

Local mean time of beginning . . . . $15^h\ 28^m\ 38^s$
For the end we have app. time of sunrise (Dec. $= + 13^\circ.8$) $17^h\ 27^m.4$
Interval as given . . . . $-\quad 15^m$
Equation of time . . . . $-\quad 3^m.7$
Longitude . . . . $-\ 2^h\ 5^m.0$
Greenwich mean time of end . . . . $15^h\ 3^m.7$.

(18) Page 170.—"*Éclipse de lune observée au Caire le* 15 *octobre* 981. Grandeur de l'éclipse, 5 doigts environ du diamètre; hauteur de la lune lors de l'attouchment par dehors, selon mon évaluation, 24°."

Local mean time of beginning . . . . $16^h\ 18^m\ 15^s$.

(19) Page 172.—"*Éclipse totale de lune observée au Caire le* 1 *mars* 983. Hauteur de la lune lorsque l'éclipse parut sensible, 66°; hauteur lorsque la lune eut repris sa clarté, 35° 50′; durée de l'éclipse totale une heure, environ."

Here, again, the first altitude assigned is impossible. From the second we deduce:—

Local mean time of ending . . . . $15^h\ 38^m\ 0^s$.

(20) Page 172—"*Éclipse de soleil observée au Caire le* 20 *juillet* 985. Hauteur du soleil au commencement de l'éclipse, 23° environ; hauteur à la fin, lorsque l'éclipse n'étoit plus sensible à la vue, 6°; grandeur de l'éclipse, un quart du diamètre."

Local mean time of beginning . . . . $5^h\ 1^m\ 32^s$
Local mean time of end . . . . $6^h\ 23^m\ 15^s$.

(21) Page 172.—"*Éclipse de lune observée au Caire le* 19 [18] *décembre* 986. Hauteur de la lune au commencement de l'éclipse visible, 24° occident. J'ai évalué la hauteur au moment de l'attouchement, 50° 30′; grandeur, 10 doigts du diamètre. La lune se coucha éclipsée."

I can give no explanation of this second observation. From the first altitude we have:—

Local mean time of commencement . . . . $16^h\ 56^m\ 4^s$.

(22) Page 174.—"*Éclipse de lune observée au Caire le* 12 *avril* 990. Hauteur de la lune, au commencement, je veux dire, au moment de l'attouchement, 38°."

Local mean time of "attouchement" . . . . $9^h\ 45^m\ 59^s$.

(23) Page 174—"*Éclipse de soleil observée au Caire le* 20 [19] *août* 993. Hauteur du soleil, au commencement de l'éclipse, 27° orient; hauteur au moment de la plus grande phase, 45° orient; hauteur à la fin, 60° orient; grandeur, $\frac{2}{3}$ de la surface."

Result: Mean time of commencement . . . . $19^h\ 41^m\ 23^s$
Mean time of the end . . . . $22^h\ 22^m\ 37^s$.

(24) Page 176.—"*Éclipse totale de lune observée au Caire le* 1 *mars* 1002. L'éclipse fut totale avec demeure dans l'ombre. Hauteur d'Arcturus au commencement, 52° orient; hauteur de l'étoile α du cocher, 14° occident; hauteur d'Arcturus à la fin, 35°."

On these inconsistent altitudes of Arcturus, CAUSSIN remarks that the altitude at commencement may be either 12° or 52°, but BOUVARD advised him that the latter reading must be taken. The last altitude of Arcturus, 35°, admits of no doubt in reading. The star which had the altitude 14° is also doubtful, the name given in the manuscript not being found in the Arabian Star Catalogues; but he found a similar name in SCALIGER as pertaining to α Aurigæ.

The results for beginning are:—

From altitude of Arcturus	$11^{h}\ 41^{m}\ 23^{s}$
From altitude of α Aurigæ	$11^{h}\ 45^{m}\ 40^{s}$
Adopted result	$11^{h}\ 43^{m}\ 2^{s}$.

(25) Page 178.—"*Éclipse de soleil observée au Caire le* 24 [23] *janvier* 1004. Grandeur de l'éclipse, 11 doigts; hauteur du soleil, lorsque l'éclipse commença à paroître sur son disque, 16° 30′ occident; commencement estimé à 18° 30′; hauteur lorsque le quart du diamètre étoit éclipsé, 15°; hauteur lorsque la moitié du diamètre fut éclipsée, 10°; hauteur au moment de la plus grande phase, 5°."

The difference of the first two altitudes is surprising, corresponding as it does to 11 minutes of time. The results are:—

The eclipse sensible	$4^{h}\ 6^{m}\ 13^{s}$
Estimated time of beginning	$3^{h}\ 55^{m}\ 17^{s}$.

The local mean times have been reduced to Greenwich mean time by applying the longitudes already given, and the results are shown in tabular form in the following pages. The tabular geocentric positions of the moon are first given, the times of computation being generally nearly the same with those of observation. In computing the longitudes, the double-entry tables have been omitted and the constant 22240 added, a proceeding which involves a mean error of ± 14″ in the longitudes. The moon's motion in latitude is omitted; it will be sufficient to suppose it equal to $\frac{1}{11}$ the motion in longitude. Its algebraic sign is, however, given immediately after the latitude itself.

Respecting the places of the sun, it is only necessary to say that they are from HANSEN's Tables.

Tabular Positions of the Moon and the Sun for the Arabian Observations.

No. of Eclipse.	Date and Place.	t_0 Gr. M. T. of Computation.	λ_0 Moon's Longitude.	Mot. in $0^d.01$.	β_0 Latitude: increasing + diminishing −	π Parallax.	The Sun's Longitude.	Log. of Radius vector.	Semi-diam.
	Bagdad.								
		h m s	° ′	′	′	′	° ′		′
1	829, Nov. 29	16 36 14	251 37.6	7.86	+ 22.1 −	56.9	252 37.0	9.99270	16.2
		18 26 54	252 38.1	7.87	+ 16.8 −	56.9	252 41.7	9.99269	16.2
☽ 2	854, Aug. 11	12 1 7	321 40.3	8.81	+ 18.3 +	60.3	142 35.4	. . .	15.9
☽ 3	856, June 21	12 21 58	273 34.5	8.25	− 45.2 +	58.2	94 10.6	. . .	15.7
☽ 4	923, June 1	6 56 33	255 29.8	8.60	− 43.8 −	59.6	74 43.4	. . .	15.8
5	923, Nov. 10	16 21 8	232 37.3	9.07	+ 32.4 −	61.3	233 26.8	9.99355	16.2
		17 32 32	233 22.4	9.07	+ 28.2 −	61.2	233 29.8	9.99354	16.2
☽ 6	925, April 11	2 38 36	204 16.7	8.43	+ 36.8 −	59.0	26 8.0	. . .	15.9
		7 47 49	207 18.5	8.46	+ 20.1 −	59.1	26 20.5	. .	15.9
☽ 7	927, Sept. 13	12 50 46	354 28.7	9.09	+ 51.2 +	61.3	175 12.0	. . .	16.0
8	928, Aug. 17	15 29 29	149 7.5	7.86	− 13.1 −	56.9	149 37.0	0.00304	15.9
☽ 9	929, Jan. 27	8 5 32	131 48.5	8.51	+ 30.6 −	59.3	313 14.1	. . .	16.2
☽ 10	933, Nov. 4	13 17 45	46 54.7	7.24	− 5.9 −	54.5	227 48.8	. . .	16.2
	Cairo.								
11	977, Dec. 12	18 19 2	265 49.0	9.11	+ 35.2 −	61.4	267 1.7	9.99106	16.3
		20 36 10	267 16.1	9.11	+ 27.3 −	61.4	267 7.5	9.99105	16.3
12	978, June 8	0 22 29	81 58.5	7.10	− 6.2 +	54.0	81 48.9	0.00735	15.7
		2 42 13	83 7.3	7.10	+ 0.3 +	54.0	81 54.4	0.00735	15.7
☽ 13	979, May 14	5 52 0	238 51.2	8.30	+ 32.5 −	58.5	57 57.0	. . .	15.8
14	979, May 28	4 12 58	71 47.5	7.61	+ 39.0 +	55.9	71 15.1	0.00713	15.8
☽ 15	979, Nov. 6	8 3 40	48 42.7	8.31	− 37.6 +	58.6	229 27.1	. . .	16.2
		11 18 0	50 34.8	8.29	− 27.2 +	58.5	229 35.3	. . .	16.2
☽ 16	980, May 2	14 26 0	228 24.4	7.47	− 12.0 −	55.4	47 31.3	. . .	15.8
☽ 17	981, April 21	13 28 0	216 14.9	7.09	− 45.9 −	53.9	36 40.0	. . .	15.9
☽ 18	981, Oct. 15	14 7 0	27 24.4	9.03	+ 46.6 +	61.1	208 1.6	. . .	16.1
☽ 19	983, Mar. 1	9 55 0	165 18.7	8.64	+ 31.9 −	59.7	346 13.3	. . .	16.1
		13 40 0	167 33.5	8.61	+ 19.4 −	59.6	346 22.6	. . .	16.1
20	985, July 20	2 56 30	122 43.3	8.17	+ 15.0 −	58.0	122 17.6	0.00587	15.8
		4 18 13	123 29.7	8.18	+ 10.9 −	58.1	122 20.9	0.00587	15.8
☽ 21	986, Dec. 18	14 53 0	92 16.9	7.10	+ 30.3 −	54.0	272 49.4	. . .	16.3
☽ 22	990, April 12	7 42 0	206 43.9	7.10	− 37.5 +	54.0	27 34.2	. . .	15.9
		11 4 0	208 23.4	7.10	− 28.3 +	53.9	27 42.4	. . .	15.9
23	993, Aug. 19	17 36 5	150 28.6	9.04	+ 5.3 +	61.1	151 54.6	0.00288	15.9
☽ 24	1002, Mar. 1	9 41 18	165 37.4	9.13	− 12.1 −	61.4	346 36.0	. . .	16.1
25	1004, Jan. 24	1 51 0	310 9.4	8.39	+ 15.8 +	58.8	308 43.3	9.99444	16.2

Comparison of Tabular and Observed Times for the Arabian Observations.

o. of Eclipse.	Date and Place.	Phenomenon Observed.	Local M. T. Obs.			Gr. M. T. of Obs.			Tabular Gr. Time of Geomet. Phase.			△*t*	*F*	△*l*	Class.
	Bugdad.		*h*	*m*	*s*	*h*	*m*	*s*	*h*	*m*	*s*	*m*			
1	829, Nov. 29	⊙ Beginning .	19	33	44	16	36	14	15	50	20	+ 45.9	0.51	− 23.2	*a*
		⊙ Ending . .	21	24	24	18	26	54	18	8	56	+ 18.0	0.42	− 7.6	*b*
2	854, Aug. 11	☽ Beginning .	14	58	37	12	1	7	11	53	59	+ 7.1	0.51	− 3.6	*b*
3	856, June 21	☽ Beginning .	15	19	28	12	21	58	12	18	13	+ 3.7	. .	− 1.9	*a*
4	923, June 1	☽ Ending . .	9	54	3	6	56	33	6	49	49	+ 6.7	. .	− 3.4	*a*
5	923, Nov. 10	⊙ Ending . .	20	30	2	17	32	32	17	15	50	+ 16.7	0.40	− 6.7	*b*
6	925, Apr. 11	☽ Beginning .	7	20	6	4	22	36:	4	27	8	− 4.5	0.51	+ 2.3	*c*
		☽ Ending . .	10	45	19	7	47	49	7	45	35	+ 2.2	. .	− 1.1	*a*
7	927, Sept. 13	☽ Beginning .	15	48	16	12	50	46	13	4	1	− 13.2	. .	+ 6.7	*b*
8	928, Aug. 17	⊙ Ending . .	18	26	59	15	29	29	15	19	26	+ 10.0	0.45	− 4.5	*a*
9	929, Jan. 27	☽ Beginning .	11	3	2	8	5	32	9	4	20	− 58.8	0.51	+ 29.7	*a*
10	933, Nov. 4	☽ Beginning .	16	15	15	13	17	45	13	15	54	+ 1.8	. .	− 0.9	*a*
	Cairo.														
11	977, Dec. 12	⊙ Beginning (S.)	20	24	4	18	19	2	18	10	30	+ 8.5	0.37	− 3.2	*b*
		⊙ Ending . .	22	41	12	20	36	10	20	33	0	+ 3.2	0.35	− 1.1	*b*
12	978, June 8	⊙ Beginning (S.)	2	27	31	0	22	29	23	57	47	+ 24.7	0.28	− 6.9	*a*
		⊙ Ending . .	4	47	15	2	42	13	2	38	20	+ 3.5	0.48	+ 1.9	*a*
13	979, May 14	☽ Ending . .	7	57	2	5	52	0	5	40	44	+ 11.3	0.51	− 5.8	*c*
14	979, May 28	⊙ Beginning (S.)	6	18	0	4	12	58	4	2	38	+ 10.2	0.52	− 5.3	*a*
15	979, Nov. 6	☽ Beginning .	10	9	50	8	4	48	8	1	26	+ 3.4	0.51	− 1.7	*b*
		☽ Ending . .	13	22	52	11	17	50	11	3	55	+ 13.9	. .	− 7.0	*b*
16	980, May 2	☽ Beginning .	.	.	.	☽ too high			10	39	0	. .	. .	. .	.
		☽ Ending . .	16	38	8	14	33	06	14	28	19	+ 4	. .	− 2.4	*c*
17	981, Apr. 21	☽ Beginning .	15	28	42	13	23	40	13	20	50	+ 2.8	. .	− 1.4	*c*
		☽ Ending . .	17	8	44	15	3	42	15	5	18	− 1.6	. .	+ 0.8	*c*
18	981, Oct. 15	☽ Beginning .	16	18	15	14	13	13	13	58	25	+ 14.8	. .	− 7.7	*b*
19	983, Mar. 1	☽ Beginning (S.)	.	.	.	too high			9	59	39	. .	. .	. .	.
		☽ Ending . .	15	37	58	13	32	56	13	15	14	+ 17.7	. .	− 8.9	*a*
20	985, July 20	⊙ Beginning .	5	1	32	2	56	30	2	32	10	+ 24.3	0.43	− 10.6	*c*
		⊙ Ending . .	6	23	15	4	18	13	4	3	32	+ 14.7	0.62	− 9.1	*c*
21	986, Dec. 18	☽ Beginning (S.)	16	56	6	14	51	4	14	28	56	+ 22.1	0.51	− 11.2	*a*
22	990, Apr. 12	☽ Beginning (at)	9	45	59	7	40	57	8	6	9	− 25.2	. .	+ 12.8	*b*
23	993, Aug. 19	⊙ Beginning .	19	41	23	17	36	21	17	36	1	+ 0.3	0.41	− 0.1	*a*
		⊙ Ending . .	22	22	37	20	17	35	19	57	43	+ 19.9	0.51	− 10.2	*c*
24	1002, Mar. 1	☽ Beginning .	11	43	2	9	38	0	9	35	28	+ 2.5	. .	− 1.3	*a*
		☽ Ending . .	.	.	.	unavailable			12	59	2	. .	. .	. .	.
25	1004, Jan. 24	⊙ Beginning (est.)	3	55	17	1	50	15	1	39	6	+ 11.1	0.44	− 4.4	*b*

Next is shown the comparison of the tabular and observed times. In the column "Phenomenon observed", S. signifies that the time of observation is that at which the eclipse was said to be sensible to the sight, whereas, in other cases, only the phrase beginning or ending is used. As these phenomena necessarily occur after the times of geometric first contact, they must be a little too late. The observed times of ending must be supposed too early by a less amount. In the table, however, the comparisons are made with the geometric contacts only. Column Δt shows the difference between the observed time and the computed tabular time of the geometric phase. It is next necessary to multiply this difference by the appropriate factor to reduce it to correction of the moon's mean longitude. For the required factor has been taken

$$\frac{dD}{dt} \div \frac{dD}{d\varepsilon};$$

these quantities being computed by the formulæ given in the next section, on the reduction of eclipses and occultations. In the case of eclipses of the moon, the factor may be supposed to have the constant value 0.51. Column Δl gives the individual corrections to the moon's mean longitude thus obtained.

In the last column, an attempt is made to classify the results. The letter *a* generally signifies that the materials for the determination of time are unexceptionable; *b*, that there is room for error, owing to the vertical circle drawn through the object of which the altitude was observed for time being too near the meridian, or to the eclipse being a small one; *c*, that the data for time are yet more defective, or that the time determined by the observers had to be used.

Passing now to the consideration of the results, we remark that these observations are not of the class in which a system of weights determined *a priori* can be adhered to, owing to the liability of the observations to abnormal errors. With a view of forming a judgment how far the observations are thus affected, we begin by finding the narrowest limits within which a majority of the results can be included, making no distinction of weights, and including all discordant observations. We readily find these limits of Δl to be $-0'.8$ and $-6'.8$, between which are included 17 out of the 33 results. This, taken alone, would indicate a mean correction of $-3'.8$, and a probable error of $3'$ for each observation. Extending the limits still farther, we find that 27 out of the 33 are contained on or between the limits $+2'.3$ and $-10'.6$, or, omitting the two contained on these limits, three fourths of the whole number of results are contained between them, while the outlying results are equal in number on each side. This would indicate an individual probable error of $3'.8$, with nearly the same mean result.

Reversing the reasoning, if we suppose a probable error of $3'$, then three fourths of the whole number of observations, or 25 in all, ought to be contained between limits extending through $10'.2$, while 27 should be contained between limits differing by $12'$, and the remaining 6 should lie but little outside the limits, always supposing the admitted law of error to hold. Most of the six outlying observations are so far from fulfilling this condition as to show conclusively that the law in question does not hold, and, therefore, that *the arithmetical mean is not the most probable final result.*

The following results are so far outside the limits of probable error as to be suspicious, if not certainly abnormal:—

829, November 29.—*Beginning.*—The tables show that the eclipse began at or before sunrise. How a real beginning could have been observed more than half an hour afterward, it is hard to see. The observation is, therefore, clearly inadmissible.

927, September 13.—Though the time from the altitude of Sirius is of the second order of accuracy, the observation with the astrolabe confirms it, so that the discrepancy is hard to account for. Possibly, the keen eye of the young observer caught the penumbra some time before the actual advent of the shadow. The smallness of the eclipse would only admit of giving half weight to the observation, even were the result good.

929, January 27.—Nothing can be done with this eclipse, the observed time appearing exceptionably free from a liability to possible error.

990, April 12.—Here we have nothing to check the record that the moon was 38° high "au moment de l'attouchement". I think the result should be rejected, especially as the term translated *attouchement* seems to be of doubtful meaning.

Of the four discordant eclipses, there will, I conceive, be no question that those of 829, 929, and 990 should be rejected. Respecting that of 927, doubt may be entertained; I, therefore, retain it. In taking the mean, it may seem advisable to give classes *b* and *c* half weight, compared with *a*.

We have, before taking any means, to consider the cases of those eclipses of which the phases of beginning are distinctly stated to be those when the eclipse was apparent to the view, which are marked (S.) in the third column. It might seem that all the observed beginnings should be referred to this phase, but the general run of the comparisons seems to favor the belief that the times were made to refer to the actual contacts by an estimate of the observer in each case. The correction to be applied for the phase in question does not admit of a definite determination, but must rest upon our estimate of the acuteness of the Arab vision. I conceive that we may assume $2\frac{1}{2}'$, a probable mean correction to reduce to geometrical contact; but what we really want to do is, not to reduce to real contact, but to the greatest phase of invisibility, so that the times of beginnings shall correspond to those of the endings when the eclipse was no longer visible. We shall, therefore, apply a correction of plus $1'.5$ to each value of Δl dependent on a phase of beginning marked (S.). The observations are clearly divisible into three groups, separated by pretty wide intervals. The mean results are:—

850	$\Delta l = -3'.8 \pm 2'.4$	3 phases.
927	$-1'.6 \pm 1'.7$	7 phases.
986	$-4'.5 \pm 1'.3$	20 phases.

The probable errors are obtained on the supposition that the probable error of a result of class *b* is $\pm 4'.5$, and that each group is affected with a probable systematic error of $\pm 1'$ in addition to all accidental errors.

§ 6.

MODE OF DEDUCING THE ERRORS OF THE LUNAR ELEMENTS FROM THE ECLIPSES AND OCCULTATIONS.

The method of computing eclipses and occultations may generally be divided, though not perhaps with entire sharpness, into two classes: in the one, the position of the observer relatively to the cone, or cylinder, which circumscribes the moon and the occulted object is computed by geometric methods, and the condition of an occultation or of the beginning or end of an eclipse is that the observer shall be on the surface of this cone; in the second class, the apparent position and magnitude of the two bodies, as seen by the observer, are computed, and the corresponding condition is, that the apparent distance of centres shall be equal to the sum of the apparent semi-diameters. The first method is preferable on the score of elegance of treatment and of general certainty and convenience in cases where the phenomenon has been observed from several stations. It requires, however, that the positions of both bodies be known before the computations of the phenomenon are commenced. This requirement has prevented its use in the present investigation, because it was desirable to postpone the final determination of the positions of the stars to the latest practicable moment, in order that the best available data might be used. The method adopted is, therefore, to determine separately and independently the apparent positions of the moon and of the sun or star, and then to deduce equations of condition from the difference between the computed distance of centres and the sum of the semi-diameters; or, in the case of solar eclipses, from the difference between the observed and computed phases.

In this computation, I have used celestial longitudes and latitudes throughout, and not right ascensions and declinations. While there is, perhaps, no difference in the amount of labor involved in the two methods, the method adopted is recommended by the greater simplicity and directness of the computations, the ease with which they can be controlled and the slightness of the modification which will be necessary if the results desired are only approximate. These advantages are especially seen in the computation of the apparent place of the star, which is so much more simple when the longitude and latitude are required than in the case of the right ascension and declination, that when two or three places are required for distant epochs, the labor of transforming the co-ordinates of the star may be fully compensated by the consequent ease with which its apparent place can be determined.

The investigation of the formulæ actually used is as follows:—

1.—*Apparent Place of the Moon.*

Put

r, l, b, the geocentric radius-vector, longitude, and latitude of the moon;

ρ, λ, β, the corresponding co-ordinates of the observer;

r', l', b', the corresponding co-ordinates of the moon as seen by the observer;

π, the moon's equatorial horizontal parallax; and

$$R = \frac{r'}{r}.$$

The values of λ and β are obtained from the observer's geocentric longitude and local sidereal time by changing the right ascension and declination of his geocentric zenith into longitude and latitude. If we take the earth's equatorial radius for unity of distance, the value of ρ may be taken at once from geodetic tables, or computed from well-known formulæ. Putting

φ', the observer's geocentric latitude;
τ, his sidereal time expressed in arc;
ω, the obliquity of the ecliptic,

compute u and k' from the formulæ

$$k' \sin u = \rho \sin \varphi';$$
$$k' \cos u = \rho \cos \varphi' \sin \tau.$$

Then, $\rho \cos \beta$, $\rho \sin \beta$, and λ are given by

$$\begin{aligned} \rho \cos \beta \cos \lambda &= \rho \cos \varphi' \cos \tau; \\ \rho \cos \beta \sin \lambda &= k' \cos (u - \omega) = \cos \omega\, \rho \cos \varphi' \sin \tau + \sin \omega\, \rho \sin \varphi'; \\ \rho \sin \beta &= k' \sin (u - \omega) = \cos \omega\, \rho \sin \varphi' - \sin \omega\, \rho \cos \varphi' \sin \tau. \end{aligned}$$

A partial check on the accuracy of the computations may be obtained by computing $\sin \beta$ and $\cos \beta$, and noting that the two correspond to the same angle; but, as this quantity is not needed separate from ρ, I have preferred to depend on duplicate computation by different computers. It may be remarked that 5-place logarithms are always ample in this computation, and that the error from neglecting the nutation of the obliquity of the ecliptic can never exceed 0''.15 in the apparent place of the moon.

Taking the earth's equatorial radius as unity, which gives

$$r \sin \pi = 1,$$

we have the three equations:—

$$\begin{aligned} R \cos b' \cos l' &= \cos b \cos l - \rho \cos \beta \sin \pi \cos \lambda. \\ R \cos b' \sin l' &= \cos b \sin l - \rho \cos \beta \sin \pi \sin \lambda. \\ R \sin b' &= \sin b \quad - \rho \sin \beta \sin \pi. \end{aligned} \qquad (1)$$

Let α be any arbitrary angle. If we transform the first two equations into the two others,

$$(1) \times \cos \alpha + (2) \times \sin \alpha,$$
$$-(1) \times \sin \alpha + (2) \times \cos \alpha,$$

they will be:—

$$\begin{aligned} R \cos b' \cos (l' - \alpha) &= \cos b \cos (l - \alpha) - \rho \cos \beta \sin \pi \cos (\lambda - \alpha). \\ R \cos b' \sin (l' - \alpha) &= \cos b \sin (l - \alpha) - \rho \cos \beta \sin \pi \sin (\lambda - \alpha). \end{aligned}$$

If we suppose $\alpha = \lambda$, they will be:—

$$\begin{aligned} R \cos b' \cos (l' - \lambda) &= \cos b \cos (l - \lambda) - \rho \cos \beta \sin \pi. \\ R \cos b' \sin (l' - \lambda) &= \cos b \sin (l - \lambda). \end{aligned} \qquad (2)$$

Apart from the number of decimals required, these equations are the most simple. They give $R \cos b'$ and $l' - \lambda$, while the third of equations (1) gives $R \sin b'$, whence b' and R are obtained. They require, however, the full number of decimals requisite to determine a large angle with the required degree of accuracy. Since λ may be known only to 0′.1, while $l - \lambda$ must be known to 0″.1, it is necessary to see that the same value is subtracted from l, and then added to $l' - \lambda$.

If we suppose $\alpha = l$, the equations will be:—

$$\begin{aligned} R \cos b' \cos (l' - l) &= \cos b - \rho \cos \beta \sin \pi \cos (l - \lambda). \\ R \cos b' \sin (l' - l) &= \rho \cos \beta \sin \pi \sin (l - \lambda). \end{aligned} \qquad (3)$$

These equations have the advantage of requiring only 6-place logarithms.

Having thus obtained R, b', $l' - l$ or $l' - \lambda$, and thence l', the apparent semidiameter of the moon, or s', is found from the equation

$$\sin s' = \frac{k \sin \pi}{R};$$

k being the ratio of the diameter of the moon to that of the earth. The semidiameter, s', is so minute that we may suppose it equal to its sine, making the equation for its determination, in seconds,

$$s' = \frac{[5.31443]\, k \sin \pi_{\text{I}}}{R}.$$

The value of k which we shall adopt is that of OUDEMANS,* 0.27264. This will give:—

$$\log k = 9.43559.$$

$$s' = \frac{[4.75002] \sin \pi}{R}.$$

2.—*Apparent Place of the Sun or Star.*

If the phenomenon is an eclipse of the sun, the position of the sun is derived immediately from the tables. It must, however, be corrected for parallax. Owing to the minuteness of this correction, and the near approach of the centres of the sun and moon during any phase of an eclipse, it will be sufficient to subtract the horizontal parallax of the sun from that of the moon, to use this difference instead of π in the preceding formulæ, and then to apply no correction to the place of the sun on account of parallax.

In the case of a star, the longitude and latitude are to be reduced to the date of the observation by applying precession, proper motion, nutation, and aberration. If we put

κ, the rate of motion of the pole of the ecliptic on the celestial sphere;
γ, the longitude of the point toward which it is moving;
T, centuries after 1800; and
T', centuries after 1850,

the resulting rate of change of the longitude and latitude of a star arising from the motion of the ecliptic alone will be:—

In longitude, $\kappa \tan B \sin (L - \gamma)$.
In latitude, $\kappa \cos (L - \gamma)$.

These expressions being independent of the equinox of reference, we may, in them, suppose both L and γ to be referred to a fixed equinox.

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In reducing the star-places to the ecliptic, HANSEN's obliquity will be used, the value of which is:—

$$\omega = 23^\circ\ 27'\ 54''.80 - 46''.78\ T.$$

Adopting this change of obliquity, as I have done in my *Investigation of the Orbit of Uranus*, where the motion of the pole of the ecliptic in the direction of the vernal equinox of 1850 is $5''.43\ T' + 0''.19\ T'^2$, and that in the direction of 90° greater longitude is $46''.78\ T' - 0''.06\ T'^2$, we find, taking the century as the unit of time, and counting from 1800,

$$\varkappa = 47''.09 - 0''.09\ T',$$
$$\gamma = 83^\circ\ 23' - 28'\ T';$$

γ being here counted from the fixed equinox of 1850. Counting from the equinox of 1800, the expression will be:—

$$\gamma = 82^\circ\ 55' - 28'\ T.$$

Taking the expressions just given for the motion in longitude and latitude, when the equinox is fixed, namely,

$$\frac{dL}{dT} = \varkappa \tan B \sin (L - \gamma),$$
$$\frac{dB}{dT} = \varkappa \cos (L - \gamma),$$

we find, by differentiating and substituting the numerical values of the centennial variations of $\varkappa$ and γ,

$$\frac{d^2L}{dT^2} = \tfrac{1}{2}\varkappa^2 \sec^2 B \sin 2(L-\gamma) - 0''.09 \tan B \sin (L-\gamma) + 28'\ \varkappa \tan B \cos (L-\gamma).$$

In the case of occulted stars, the maximum value of this expression is about 0''.04, and the corresponding effect on the longitude of the star is $0''.02\ T^2$; it may, therefore, be entirely neglected. For the secular variation of the motion in latitude, we have, neglecting insensible terms,

$$\begin{aligned}\frac{d^2B}{dT^2} &= -0''.09 \cos (L-\gamma) - 28'\ \varkappa \sin (L-\gamma)\\ &= -0''.09 \cos (L-\gamma) - 0''.38 \sin (L-\gamma)\\ &= \quad 0''.39 \sin (L - \gamma + 194^\circ).\end{aligned}$$

The proper motion in longitude and latitude may be derived from those in right ascension and declination by the well-known formulæ for converting changes of the one system of co-ordinates into those of the other. If we put

μ, μ', μ_1, μ_2 the proper motions in right ascension, declination, longitude, and latitude respectively; and

E, the complement of the angle at the star of the triangle formed by the star and the poles of the equater and ecliptic,

we shall have:—

$$\begin{aligned}\cos E &= \sin \omega \cos \alpha \sec B = \sin \omega \cos L \sec \delta.\\ \mu_1 &= \mu \sin E \cos \delta \sec B + \mu' \cos E \sec B. \qquad (4)\\ \mu_2 &= -\mu \cos E \cos \delta + \mu' \sin E.\end{aligned}$$

Owing to the extreme slowness with which the position of the ecliptic changes, μ_1 and μ_2 may be supposed constant, which is not the case with μ and μ'.

Collecting the various terms in the motion of the star which we have deduced, and including precession, we find that its longitude and latitude, at the epoch T centuries after 1800, referred to the equinox of the epoch, is:—

$$\begin{aligned} L &= L_0 + L' T + L'' T^2; \\ B &= B_0 + B' T + B'' T^2; \end{aligned} \tag{5}$$

where we put

L_0, B_0, the longitude and latitude for 1800.0;

$$\begin{aligned} \gamma_0 &= 82^\circ\ 55'; \\ L' &= \mu_1 + 5024''.11 + 47''.14 \tan B_0 \sin (L_0 - \gamma_0); \\ L'' &= 1''.13; \\ B' &= \mu_2 + 47''.14 \cos (L_0 - \gamma_0); \\ B'' &= 0''.20 \sin (L_0 - \gamma_0 + 194^\circ). \end{aligned} \tag{6}$$

If we count L_0, B_0, and γ_0 from the equinox and ecliptic of 1850, and T from the epoch 1850.0, the same expressions will hold by putting

$$\begin{aligned} \gamma_0 &= 83^\circ\ 23'; \\ L' &= \mu_1 + 5025''.24 + 47''.09 \tan B_0 \sin (L_0 - \gamma_0); \\ L'' &= 1.13; \\ B' &= \mu_2 + 47''.09 \cos (L_0 - \gamma_0); \\ B'' &= 0''.20 \sin (L_0 - \gamma_0 + 194^\circ) = 0''.20 \sin (L_0 - 111^\circ). \end{aligned} \tag{6'}$$

Having thus obtained the mean position of the star for the required epoch, the apparent position is obtained by applying nutation and aberration. But, if the former correction be omitted from the place of the moon, it may be omitted from that of the star also. This course has been adopted. The correction for aberration is:—

$$\begin{aligned} \delta L &= -\ 20''.45 \sec B \cos (\odot - L); \\ \delta B &= -\ 20''.45 \sin B \sin (\odot - L); \end{aligned}$$

the symbol $\odot$ representing the sun's true longitude.

3.—*Distance of Centres of the Two Bodies.*

Having found, by the preceding methods,

L, B, the longitude and latitude of the star or sun,

l', b', s', the longitude, latitude, and semi-diameter of the moon,

the distance of centres, D, and the angle of position, m, of the line joining the centres are given by the equations:—

$$\begin{aligned} \sin \tfrac{1}{2} D \sin m &= \sin \tfrac{1}{2} (l' - L) \sqrt{\cos b' \cos B}; \\ \sin \tfrac{1}{2} D \cos m &= \sin \tfrac{1}{2} (b' - B); \end{aligned}$$

the angle m being counted from the south point of the moon's disk toward the west. We have also

$$\cos b' \cos B = \cos^2 \tfrac{1}{2} (b' + B) - \sin^2 \tfrac{1}{2} (b' - B).$$

Since the last term of this equation can never amount to $\frac{1}{100000}$, we may substitute $\cos \frac{1}{2}(b' + B)$ for $\sqrt{\cos b' \cos B}$ in the first of equations (6). We may also determine D and m with all necessary accuracy from the approximate equations,

$$\left.\begin{aligned} D \sin m &= (l' - L) \cos \tfrac{1}{2}(b' + B), \\ D \cos m &= b' - B. \end{aligned}\right)$$

The error in this determination of m will be of no importance, because this angle is never observed with such accuracy as to be used as a datum for correcting the moon's place, while the error in D is so small as to be entirely unimportant. In fact, if we represent by D' the approximate value of D derived from (7), we have:—

$$D'^2 = (l' - L)^2 \cos^2 \tfrac{1}{2}(b' + B) + (b' - B)^2;$$

while developing the sines of $\frac{1}{2} D$, $\frac{1}{2}(l' - L)$, and $\frac{1}{2}(b' - B)$ in the rigorous equation to quantities of the third order, we have:—

$$\sin \tfrac{1}{2} D = \tfrac{1}{2} \mathrm{D} \left(1 - \frac{1}{24} D^2\right).$$

$$\sin \tfrac{1}{2}(l' - L) = \tfrac{1}{2}(l' - L)\left(1 - \frac{1}{24}(l' - L)^2\right).$$

$$\sin \tfrac{1}{2}(b' - \mathrm{B}) = \tfrac{1}{2}(b' - B)\left(1 - \frac{1}{24}(b' - B)^2\right).$$

Substituting these values in the rigorous equations, and taking the sum of the squares of the two equations, we find

$$D^2 = (l' - L)^2 \cos^2 \tfrac{1}{2}(b' + B) + (b' - B)^2 + \frac{1}{12}\left(D^4 - \varDelta l^4 \cos^2 \tfrac{1}{2}(b' + B) - \varDelta b^4\right),$$

where we have put, for brevity,

$$\varDelta l = l' - L;$$
$$\varDelta b = b' - B.$$

Substituting the above value of D'^2, we have

$$(D - D')(D + D') = \frac{1}{12}\left(D^4 - \varDelta l^4 \cos^2 \tfrac{1}{2}(b' + B) - \varDelta b^4\right),$$

showing that the maximum value of $D - D'$ is $\frac{1}{48} D^3$, or less than 0''.01. The equations (7) are therefore exact enough for all practical purposes.

4.—*Equations of Correction.*

If all the elements of reduction were correct, we should have, in case of an occultation, the value of D from (7) equal to that of s' from (4). We have now to find the equation of condition which must subsist among the corrections to the lunar elements in order that we may have $D = s'$. Owing to the minuteness of these corrections, their coefficients need not be accurate to more than two significant figures; we may therefore suppose $\cos \frac{1}{2}(b' + B)$ to be equal to unity, since its minimum value exceeds 0.995. If then we put, for brevity,

$$x = (l' - L) \cos \tfrac{1}{2}(b' + B),$$
$$y = b' - B,$$

$\frac{1}{2}(b' + B)$ differs so little from b that we may put

$$\delta x = (\delta l' - \delta L) \cos b,$$
$$\delta y = \delta b' - \delta B;$$

from which

$$\delta D = (\delta l' - \delta L) \cos b \sin m + (\delta b' - \delta B) \cos m. \tag{8}$$

Let us now refer to the equations (1) and (3). If we put, for brevity,

$$\begin{aligned} p &= \rho \cos \beta \sin \pi, \\ q &= \rho \sin \beta \sin \pi, \end{aligned} \tag{9}$$

we have from (3) and (1)

$$\tan (l' - l) = \frac{p \sin (l - \lambda)}{\cos b - p \cos (l - \lambda)},$$

$$R \sin b' = \sin b - q.$$

The angle $l' - l$, or the parallax in longitude, is so small that we may suppose it equal to its tangent, while the denominator, $\cos b - p \cos (l - \lambda)$, is always contained between the limits 0.98 and unity. Again, the quantity R is always contained between the limits 0.982 and unity. We may then put, without an error of more than one hundredth in the coefficients,

$$\begin{aligned} l' - l &= 1.01\, p \sin (l - \lambda), \\ \sin b' &= \frac{1}{R} (\sin b - q). \end{aligned} \tag{10}$$

From these equations we obtain

$$\delta l' = \{1 + 1.01\, p \cos (l - \lambda)\}\, \delta l + 1.01 \sin (l - \lambda) \cdot \delta p - 1.01\, p \cos (l - \lambda)\, \delta\lambda;$$

and, putting $\cos b$ and $\cos b'$ equal to unity,

$$\delta b' = 1.01\, \delta b - 1.01\, \delta q - \frac{1}{R^2} (\sin b - q)\, \delta R. \tag{11}$$

Owing to the minuteness of p, q, δb, δp, and δq, the factor 1.01 may be entirely omitted in the above expressions. We have next, from (9), putting $\cos \pi$ equal to unity:—

$$\begin{aligned} \delta p &= \rho \cos \beta\, \delta\pi - q\, \delta\beta. \\ \delta q &= \rho \sin \beta\, \delta\pi + p\, \delta\beta. \end{aligned}$$

The longitude and latitude of the observer's geocentric zenith, λ and β, are functions of his latitude and of the local sidereal time. The former must be supposed to be known; but the variation of the latter may be taken into account in order to determine the effect of an error in the time of observation upon the lunar elements. The most simple formulæ for expressing errors of longitude and latitude in terms of the errors of right ascension and declination are those of GAUSS, in his *Theoria Motus Corporum Coelestium*, § 68, and are these:—Determine the angle E between 0° and 180° from the equation

$$\cos E = \sin \omega \cos \tau \sec \beta = \sin \omega \cos \lambda \sec \varphi'.$$

Then

$$\begin{aligned} \delta\lambda &= \cos \varphi' \sin E \sec \beta\, \delta\tau + \cos \mathrm{E} \sec \beta\, \delta\varphi', \\ \delta\beta &= -\cos \varphi' \cos E\, \delta\tau + \sin E\, \delta\varphi'. \end{aligned}$$

The last term in each equation is included only for the sake of completeness in writing. The substitution of this value in δp and δq, neglecting $\delta\varphi'$, gives:—

$$\delta p = \rho \cos\beta\,\delta\pi + q \cos\varphi' \cos E\,\delta\tau.$$
$$\delta q = \rho \sin\beta\,\delta\pi - p \cos\varphi' \cos E\,\delta\tau.$$

The correction to the tabular ecliptic longitude is represented by δl. For the sake of completeness, we shall suppose the local mean time of observation to require the correction δt, and the west longitude of the plane to require the correction $\delta\lambda'$. We shall then have, for the total correction to the moon's geocentric longitude and latitude,

$$\delta l + (\delta t + \delta\lambda')\frac{dl}{dt},$$
$$\delta b + (\delta t + \delta\lambda')\frac{db}{dt},$$

which are to be substituted for δl and δb in (11).

By taking the square root of the sum of the squares of equations (1), neglecting terms of the second order with respect to the parallax, we find:—

$$R = 1 - p \cos b \cos(l - \lambda) - q \sin b.$$

Hence

$$\delta R = -\cos b \cos(l-\lambda)\,\delta p - \sin b\,\delta q + p \cos b \sin(l-\lambda)(\delta l - \delta\lambda)$$
$$+ (p \sin b \cos(l-\lambda) - q \cos b)\,\delta b;$$

or, by substituting for δp, δq, and $\delta\lambda$ their values,

$$\delta R = p \cos b \sin(l-\lambda)\,\delta l + (p \sin b \cos(l-\lambda) - q \cos b)\,\delta b$$
$$+ \rho \cos\varphi' \sin\pi\,\{\cos\beta \cos E \sin b - \sin E \cos b \sin(l-\lambda)$$
$$- \sin\beta \cos E \cos b \cos(l-\lambda)\}\,\delta\tau - \rho\,(\cos\beta \cos b \cos(l-\lambda) + \sin\beta \sin b)\,\delta\pi$$

In these several equations, τ is the sidereal time expressed in arc; and, by taking for the unit of time that in which the earth rotates through unity of arc, we may suppose $\delta t = \delta\tau$. If we substitute these several expressions in (11), omitting the factor .01, which renders the terms in which it occurs unimportant, omitting also the terms which contain $\sin b \sin\pi$ or $\sin^2 b$ as a factor, we find:—

$$\delta l' = \{1 + p \cos(l-\lambda)\}\,\delta l + \{1 + p \cos(l-\lambda)\}\frac{dl}{dt}\,\delta\lambda'$$
$$+ \left\{[1 + p \cos(l-\lambda)]\frac{dl}{dt} + \rho \cos\varphi' \sin\pi\,[\sin\beta \cos E \sin(l-\lambda)\right.$$
$$\left. - \sin E \cos(l-\lambda)]\right\}\delta\tau + \rho \cos\beta \sin(l-\lambda)\,\delta\pi. \qquad (12)$$
$$\delta b' = \delta b + \frac{db}{dt}\,\delta\lambda' + \left(\frac{db}{dt} + p \cos\varphi' \cos E\right)\delta\tau$$
$$+ \{\sin b \cos\beta \cos b \cos(l-\lambda) - \sin\beta\}\,\rho\,\delta\pi.$$

The coefficients of $\delta\pi$ in these equations may be obtained with greater ease, and with ample accuracy, from the expressions:—

$$\frac{dl'}{d\pi} = \frac{l' - l}{\pi}.$$

$$\frac{db'}{d\pi} = \frac{b' - b}{\pi}.$$

Our next step will be to substitute the corrections of the moon's longitude in orbit and of the position of the plane of the orbit for those of the ecliptic longitude and latitude. Let us put

v, the moon's longitude in orbit, counted from a departure point in the orbit;
θ, the longitude of the node;
ϖ, the longitude of the perigee;
i, the inclination of the orbit;
u, the argument of latitude; and
β', a latitude counted in a direction perpendicular to the plane of the orbit:

the ecliptic longitude and latitude will then be given in terms of u, θ, and i, by the equations

$$\tan(l - \theta) = \cos i \tan u,$$
$$\sin b = \sin i \sin u;$$

whence we derive, for the differential variations,

$$\cos b\, \delta l = \cos b\, \delta\theta + \sec b \cos i\, \delta u - \sin b \cos(l - \theta)\, \delta i,$$
$$\cos b\, \delta b = \sin i \cos u\, \delta u + \cos i \sin u\, \delta i.$$

As we have defined v and β', their variations are given by the equations

$$\begin{aligned} \delta v &= \delta u + \cos i\, \delta\theta, \\ \delta\beta' &= \sin u\, \delta i - \sin i \cos u\, \delta\theta. \end{aligned} \tag{13}$$

The relation of these four equations is such that $\cos b\, \delta l$ and δb admit of being expressed as functions of δv and $\delta\beta'$ simply. The equations for this purpose are:—

$$\begin{aligned} \cos b\, \delta l &= \frac{\cos i}{\cos b}\, \delta v - \sin i \cos(l - \theta)\, \delta\beta'. \\ \delta b &= \sin i \cos(l - \theta)\, \delta v + \frac{\cos i}{\cos b}\, \delta\beta'. \end{aligned} \tag{14}$$

In fact, by substituting in these equations the values of δv and $\delta v'$ from (13), we shall reproduce the expressions for $\cos b\, \delta l$ and $\cos b\, \delta b$ just given.

If we determine an angle α by the equation

$$\sin \alpha = \sin i \cos(l - \theta),$$

we shall have

$$\frac{\cos i}{\cos b} = \cos \alpha;$$

and α will then be the angle which the moon's orbit makes with the parallel of latitude.

If in (12) we put, for brevity,

$$1 + p \cos (l - \lambda) = f,$$

the quantity f will be so near unity that we may suppose δb to be multiplied by it without any sensible error. Taking, next, so much of the expression for δD in (8) as depends on the place of the moon, namely,

$$\delta D = \cos b \ \delta l' \sin m + \delta b' \cos m,$$

if we substitute for δl and $\delta b'$ the terms of (12) which depend on δl and δb, we find

$$\delta D = f (\sin m \cos b \ \delta l + \cos m \ \delta b);$$

while substituting the angle α, (14) become

$$\cos b \ \delta l = \cos \alpha \ \delta v - \sin \alpha \ \delta \beta',$$
$$\delta b = \sin \alpha \ \delta v + \cos \alpha \ \delta \beta';$$

whence we derive

$$\delta D = f \{ \sin (m + \alpha) \ \delta v + \cos (m + \alpha) \ \delta \beta' \}. \qquad (15)$$

If we substitute for δv and $\delta \beta'$ their values in (13), we shall have

$$\delta D = f \{ \sin (m + \alpha) \ \delta u + \cos (m + \alpha) \sin u \ \delta i$$
$$+ [\cos i \sin (m + \alpha) - \sin i \cos (m + \alpha) \cos u] \ \delta \theta \}.$$

Representing the moon's mean longitude counted in the usual way by ε, we shall have

$$v = \varepsilon + Q;$$

Q representing the equation of the centre and the other inequalities, and being a function of ε, ϖ, and θ, and of the sun's mean longitude, which we represent by ε'. We then have:—

$$\frac{dv}{dt} = n \left(1 + \frac{dQ}{d\varepsilon} \right) + n' \frac{dQ}{d\varepsilon'} + \frac{dQ}{d\varpi} \cdot \frac{d\varpi}{dt} + \frac{dQ}{d\theta} \cdot \frac{d\theta}{dt}.$$
$$\delta v = \left(1 + \frac{dQ}{d\varepsilon} \right) \delta \varepsilon + \frac{dQ}{d\varpi} \delta \varpi + \frac{dQ}{d\theta} \delta \theta. \qquad (16)$$

Owing to the minuteness of the terms of E which contain ε', as well as of $\frac{d\varpi}{dt}$ and $\frac{d\theta}{dt}$, we may put

$$\frac{dv}{d\varepsilon} = 1 + \frac{dQ}{d\varepsilon} = \frac{1}{n} \cdot \frac{dv}{dt},$$

without an error of more than $\frac{1}{500}$ of the whole expression. We have also, with sufficient accuracy,

$$\frac{dQ}{d\varpi} = -2 e \cos g;$$

g being the moon's mean anomaly. The coefficient $\frac{dQ}{d\theta}$ may be omitted entirely. Substituting in (15) the value of $\delta\beta'$ from (13), and that of δv from (16), after making the substitutions just indicated, we find

$$\delta D = f \Big\{ \sin (m + \alpha) \frac{1}{n} \cdot \frac{dv}{dt} \delta \varepsilon - 2 \sin (m + \alpha) \cos g \; e \; \delta\varpi + \cos (m + \alpha) \sin u \; \delta i$$
$$- \cos (m + \alpha) \cos u \sin i \; \delta\theta \Big\}.$$

In the use of this formula, $\frac{dl}{dt}$ may be substituted for $\frac{dv}{dt}$, owing to the comparative minuteness of the difference between the two expressions.

Next, to find the value of $\frac{dD}{d\tau}$ or $\frac{dD}{dt}$, we substitute the proper terms of (12) in (8). From the latter we have

$$\frac{dD}{dt} = \sin m \cos b \left(\frac{dl'}{dt} - \frac{dL}{dt} \right) + \cos m \frac{db'}{dt};$$

and from the former, omitting the factor $f = 1 + p \cos (l - \lambda)$,

$$\frac{dl'}{dt} = \frac{dl}{dt} + \rho \cos \varphi' \sin \pi \, \{ \sin \beta \cos E \sin (l - \lambda) - \sin E \cos (l - \lambda) \},$$

$$\frac{db'}{dt} = \frac{db}{dt} + p \cos \varphi' \cos E.$$

For the terms of $\frac{dD}{dt}$, independent of the moon's parallax, we find, with sufficient approximation,

$$\frac{dv}{dt} \sin (m + \alpha), \qquad \text{or} \qquad \frac{dl}{dt} \sin (m + \alpha).$$

For the other terms, we determine the quantities h and ψ by the equations

$$\cos h = \cos \beta \cos E = \sin \omega \cos \tau;$$
$$\sin h \sin (\psi - \lambda) = \sin E;$$
$$\sin h \cos (\psi - \lambda) = \sin \beta \cos E.$$

The angle h is to be taken between 0° and 180°, so that $\sin h$, like $\sin E$, is always positive. With this restriction, $\psi - \lambda$ may be obtained from the formula

$$\tan (\psi - \lambda) = \frac{\tan E}{\sin \beta}.$$

The angle $\psi - \lambda$ must therefore be included between the same limits. If we omit the factor $\cos b$, the terms which depend upon the parallax now become:—

$$\rho \cos \psi' \sin \pi \, (\sin h \sin m \sin (l - \psi) + \cos h \cos m).$$

The entire expression for $\frac{dD}{dt}$ now becomes

$$\frac{dD}{dt} = \frac{dl}{dt} \sin (m + \alpha) + \rho \cos \varphi' \sin \pi \, (\sin h \sin m \sin (l - \psi) + \cos h \cos m) - \frac{dL}{dt} \sin m.$$

h, being a function of τ simply, and independent of the place of observation, may be tabulated with τ as the argument.

For the coefficients depending on the longitude of the place, we have

$$\frac{dD}{d\lambda'}=f\frac{dl}{dt}\sin m+\frac{db}{dt}\cos m,$$

for which we may put

$$\frac{dD}{d\lambda'}=f\frac{dv}{dt}\sin(m+\alpha).$$

For the coefficient in respect to the parallax, we have

$$\frac{dD}{d\pi}=\frac{l'-l}{\pi}\sin m+\frac{b'-b}{\pi}\cos m.$$

In those of the preceding expressions which depend on the adopted unit of time, it will be remembered that this unit is tacitly supposed equal to the time in which the earth rotates through the radius unit of arc, or

$$\frac{24\text{ sidereal hours}}{2\pi},$$

or,

$$\begin{aligned}&\text{In sidereal time, } 13751^{s}=229^{m}.2=3^{h}.82;\\&\text{In mean time, } 13713^{s}=228^{m}.6=3^{h}.81.\end{aligned}$$

Numerical factors will be required when the second is taken as the unit of arc.

The formulæ to be actually employed in the computations may now be recapitulated as follows:—

(1) From the geocentric latitude of the place, φ', and the sidereal time at which an occultation was observed, τ, compute the ecliptic co-ordinates of the observer, λ, $\rho\sin\beta$, and $\rho\cos\beta$, by the formulæ:—

$$\begin{aligned}\rho\cos\beta\cos\lambda&=\rho\cos\varphi'\cos\tau,\\\rho\cos\beta\sin\lambda&=k'\cos(u'-\omega),\\\rho\sin\beta&=k'\sin(u'-\omega);\end{aligned}$$

the quantities k' and u' being first determined from the equations

$$\begin{aligned}k'\sin u'&=\rho\sin\varphi',\\k'\cos u'&=\rho\cos\varphi'\sin\tau.\end{aligned}$$

Five-place logarithms are always sufficient for this computation.

(2) Put

$$\begin{aligned}p&=\rho\cos\beta\sin\pi,\\q&=\rho\sin\beta\sin\pi;\end{aligned}$$

and compute R, l', b', and s' from the equations

$$\begin{aligned}R\cos b'\sin(l'-l)&=p\sin(l-\lambda),\\R\cos b'\cos(l'-l)&=\cos b-p\cos(l-\lambda),\\R\sin b'&=\sin b-q,\\s'&=\frac{[4.75002]\sin\pi}{R};\end{aligned}$$

l, b, and π being the tabular geocentric longitude, latitude, and parallax of the moon for the moment of observation. Here 5-place logarithms are enough for terms having $\sin \pi$ as a factor. Elsewhere, 6 are required.

(3) Having found the apparent longitude and latitude, L and B, of the eclipsed sun or occulted star, find D and m from the equations

$$D \sin m = (l' - L) \cos \tfrac{1}{2} (b' + B),$$
$$D \cos m = b' - B,$$

using 5-place logarithms. In the computations of the differential coefficients which follow, 3 places are sufficient.

(4) Find the angles E, $\psi - \lambda$, and h, all between 0° and 180°, from the equations

$$\cos E = \sin \omega \sec \beta \cos \tau,$$
$$\cos h = \sin \omega \cos \tau,$$
$$\tan (\psi - \lambda) = \frac{\tan E}{\sin \beta}.$$

For any one place, these angles may all be tabulated as a function of τ; and the values of $\sin h$ and $\cos h$, being independent of the latitude, will answer for any place whatever.

(5) Find α from the equation

$$\alpha = 5^\circ.14 \sin u,$$

which may be tabulated as a function of u.

(6) Put (l') for the motion of the moon's geocentric longitude in $0^{\rm d}.01$, expressed in minutes of arc. Then

$$\frac{dv}{d\varepsilon} = \frac{(l')}{7.90}.$$

(7) Find the moon's mean anomaly, g. When HANSEN's tables are employed, the disturbed anomaly may be used, and found by the formula

$$g = 13^\circ.065 (z - 15.18).$$

(8) The several differential coefficients which admit of being determined from the eclipse or occultation are then as follows:—

$$\frac{dD}{d\varepsilon} = \frac{dv}{d\varepsilon} \sin (m + \alpha).$$

$$\frac{dD}{e\, d\varpi} = - 2 \cos g \sin (m + \alpha).$$

$$\frac{dD}{i\, d\theta} = - \cos u \cos (m + \alpha).$$

$$\frac{dD}{di} = \sin u \cos (m + \alpha).$$

$$\frac{dD}{d\pi} = \frac{l' - l}{\pi} \sin m + \frac{b' - b}{\pi} \cos m.$$

$$\frac{dD}{d\beta'} = \cos(m + \alpha).$$

$$\frac{dD}{dt} = \frac{(l')}{14.4} \sin(m + \alpha)$$
$$+ 15.05\ \rho \cos \varphi' \sin \pi \ \{\sin h \sin m \sin (l - \psi) + \cos h \cos m\} - \frac{(L')}{14.4} \sin m.$$

$$\frac{dD}{d\lambda'} = \frac{(l')}{14.4} \sin(m + \alpha).$$

In case of an occultation, the equation of condition will be

$$\frac{dD}{d\varepsilon}\,\delta\varepsilon + \frac{dD}{e\,d\varpi}\,e\,\delta\varpi + \text{etc.} = s' - D.$$

A similar formula will hold for eclipses of the sun computed in this way, except that the distance of centres determined from the observed phase must be substituted for s'.

§ 7.

EFFECT OF CHANGES IN THE LUNAR ELEMENTS UPON THE PATH OF THE CENTRAL LINE OF AN ECLIPSE.

Not only in all ancient eclipses, but frequently in modern ones, the data derived from observation are not times, but the lines along which the edge or some point of the shadow passes. To utilize such observations, it is necessary to express the change in the central line due to changes in the moon's co-ordinates or elements. This I have done by Bessel's formulæ, in the very simple form in which they are developed by Professor Peirce in his *Trigonometry*. The notation is as follows:—

λ, the moon's geocentric longitude, *minus* that of the sun;
β, the moon's latitude, diminished by that of the sun, if necessary;
ε, the obliquity of the ecliptic;
u, the angle of position of the great circle drawn from the centre of the sun through that of the moon, measured toward the east from the circle drawn to the pole of the ecliptic;
ω, the angle which the same circle makes with the meridian passing through the sun;
π, the sun's equatorial horizontal parallax at the time;
Π, that of the moon;
γ, the angular geocentric distance of the centres of the two bodies;
m, the ratio of their linear distances from the earth's centre;
c, the angular distance of the centres of the earth and moon as seen from that of the sun;
α', δ', the right ascension and declination of the sun;
a, d, those of the line joining the centres of the sun and moon;
L, the sun's longitude.

We then have:—

$$\begin{aligned} \tan \gamma \sin u &= \tan \lambda. \\ \tan \gamma \cos u &= \tan \beta \sec \lambda. \\ m &= \frac{\sin \pi}{\sin \Pi}. \\ c &= 206265'' \, m \tan \gamma \cos \gamma. \\ \tan (u - \omega) &= \cos L \tan \varepsilon. \\ d &= \delta' - c \cos \omega. \\ a &= \alpha' - c \sin \omega \sec \delta'. \\ \omega' &= \omega - c \sin \omega \tan \delta'. \\ R &= \frac{\sin (\gamma + c)}{\sin \Pi}. \end{aligned} \qquad (1)$$

The co-ordinates of the point in which the centre of the shadow intersects the plane perpendicular to it passing through the centre of the earth will be, when reckoned in the usual way:—

$$\begin{aligned} x &= R \sin \omega'. \\ y &= R \cos \omega'. \end{aligned} \qquad (2)$$

Next, putting

φ', the geocentric latitude of a point on the earth's surface;

ρ, its distance from the earth's centre;

μ', the west hour-angle of the axis of the shadow counted from the meridian of the place; or,

$$\mu' = \text{sid. time} - a = \text{apparent time} + c \sin \omega \sec \delta';$$

the corresponding co-ordinates of the place are

$$\begin{aligned} \xi &= \rho \cos \varphi' \sin \mu', \\ \eta &= \rho (\sin \varphi' \cos d - \cos \varphi \sin d \cos \mu'), \\ \zeta &= \rho (\sin \varphi' \sin d + \cos \varphi' \cos d \cos \mu'); \end{aligned} \qquad (3)$$

and the hourly variations of the first two are

$$\begin{aligned} \xi' &= [9.4192] \, \rho \cos \varphi' \cos \mu', \\ \eta' &= [9.4192] \, \rho \cos \varphi' \sin d \sin \mu'. \end{aligned}$$

The distance of this place from the axis of the shadow at any time is

$$\sqrt{(x - \xi)^2 + (y - \eta)^2}.$$

The quantities x, ξ, y, and η, which enter into this equation, are functions of the time and of the elements of the lunar orbit. The datum supposed to be given by observation is the least distance of the place from the axis of the shadow, or the minimum value of the above expression. We are to express this minimum value in terms of the tabular elements and of the corrections to the moon's longitude and latitude and to the longitude of the sun. To compute the tabular minimum, we are supposed to be able to fix a time, τ, so near it that the differential coefficients of ξ, η, x, and y may be regarded as constant during the interval between τ and the time of minimum distance. We, therefore, suppose that for a time, t, including the moment in question, we have:—

$$\begin{aligned} x &= x_0 + x' \, (t - \tau), \\ y &= y_0 + y' \, (t - \tau), \\ \xi &= \xi_0 + \xi' \, (t - \tau), \\ \eta &= \eta_0 + \eta' \, (t - \tau), \end{aligned} \tag{4}$$

the subscript zeros indicating the tabular values at the time τ. Now, putting, for brevity,

$$\begin{aligned} X &= x_0 - \xi_0, \\ Y &= y_0 - \eta_0, \\ X' &= x' - \xi', \\ Y' &= y' - \eta', \end{aligned} \tag{5}$$

the square of the distance of centres at the time t will be

$$X^2 + Y^2 + 2\,(XX' + YY')\,(t - \tau) + (X'^2 + Y'^2)\,(t - \tau)^2,$$

which will be at a minimum when

$$t - \tau = - \frac{XX' + YY'}{X'^2 + Y'^2}.$$

The minimum value of the square will be found by substituting this value of $t - \tau$ in the preceding equation, and is

$$\frac{(X'Y - XY')^2}{X'^2 + Y'^2},$$

so that the actual tabular value of the minimum distance is

$$\varDelta = \frac{X'Y - XY'}{\sqrt{X'^2 + Y'^2}}, \tag{6}$$

which is positive when the observer, facing in the direction in which the shadow is moving, sees the axis of the latter pass him on his left hand. As the shadow always moves toward the east, $\varDelta$ will be positive when the axis of the shadow passes north of the place.

The minimum distance being thus expressed as a function of tabular quantities at the time τ, the change of this distance due to a change in those quantities will express the corresponding change in the path of the centre of the shadow, which will be positive when the change is toward the north. The changes to be considered will be those which will be produced fundamentally by small changes in the latitude, longitude, and parallax of the moon, and the longitude of the sun. Omitting the subscript zeros from x and y, we find, from the equations already given,

$$\begin{aligned} \delta x &= \sin \omega' \; \delta R + R \cos \omega' \; \delta\omega', \\ \delta y &= \cos \omega' \; \delta R - R \sin \omega' \; \delta\omega'. \end{aligned} \tag{7}$$

The quantity c is so minute that we may neglect both its changes and the terms in which it appears as a factor. Moreover, β, γ, and λ are all so small that we may put their cosines equal to unity without any error changing the differential coefficients by their thousandth part.

The rigorous value of δR being

$$\delta R = \frac{\cos(\gamma + c)}{\sin \Pi}(\delta\gamma + \delta c) - \frac{\sin(\gamma + c)}{\sin^2 \Pi} \cos \Pi \, \delta \Pi,$$

a value correct to its four-hundredth part will be

$$\delta R = \frac{\delta\gamma}{\sin \Pi} - \frac{\gamma\, \delta\Pi}{\sin^2 \Pi}. \tag{8}$$

The approximate value of c is $\frac{\gamma}{400}$, the denominator being the ratio of the distances of the sun and moon; a farther approximation to the true value of δR will therefore, be obtained by increasing the right-hand side of the last equation by its four-hundredth part. We have, to a still greater degree of approximation,

$$\delta\omega' = \delta\omega;$$

and, by differentiating the expression for $(u - \omega)$,

$$\delta\omega - \delta u = \tan \varepsilon \cos^2(u - \omega) \sin L \, \delta L. \tag{9}$$

The maximum value of this term is $0.4\, \delta L$. The probable error of the sun's tabular mean motion does not exceed $1''$ per century; the right-hand side of this equation can, therefore, scarcely ever amount to $10''$ during historic times. The greatest error in δx and δy which can arise from omitting it will therefore be of the order of magnitude

$$R \times 10'' \text{ or } \frac{R}{20000}.$$

The maximum value of R being about 4000 miles, the corresponding error in the path of the shadow will be less than 400 yards for the most ancient eclipses, and less than 50 yards for the modern ones. It may therefore be entirely omitted, which will make

$$\delta\omega = \delta u.$$

We have thus made the variations of x and y to depend on those of u, γ, and Π by the equations (7), (8), and (9). We have next to express the variations of u and γ in terms of the variations of the elements on which they depend. Since we suppose $\cos\gamma$, $\cos\lambda$, and $\cos\beta$ to be sensibly unity, we find, by differentiating the first two of equations (1),

$$\sin u \, \delta\gamma + \gamma \cos u \, \delta u = \delta\lambda,$$
$$\cos u \, \delta\gamma - \gamma \sin u \, \delta u = \delta\beta;$$

which give

$$\delta\gamma = \sin u \, \delta\lambda + \cos u \, \delta\beta,$$
$$\gamma \, \delta u = \cos u \, \delta\lambda - \sin u \, \delta\beta.$$

If we substitute in (7) for R is approximate value $\frac{\sin\gamma}{\sin\Pi}$ and for δR and $\delta\omega'$ the values derived from the equations (8) and (9), the expressions for δx and δy reduce to

$$\begin{aligned}\delta x&=\frac{\cos(u-\omega')}{\sin\Pi}\delta\lambda-\frac{\sin(u-\omega')}{\sin\Pi}\delta\beta-\frac{\gamma\sin\omega'}{\sin^2\Pi}\delta\Pi,\\ \delta y&=\frac{\sin(u-\omega')}{\sin\Pi}\delta\lambda+\frac{\cos(u-\omega')}{\sin\Pi}\delta\beta-\frac{\gamma\cos\omega'}{\sin^2\Pi}\delta\Pi.\end{aligned}\qquad(10)$$

As already shown, if we put ω in place of ω', the error thus introduced will be, at its maximum only about $\frac{1}{400}$ of the total amount of the corrections, which will be quite unimportant in all cases. If we suppose the right ascension and declination as well as the longitude of the sun to be known, we have

$$\begin{aligned}\cos(u-\omega)&=\frac{\sin\alpha'}{\sin L},\\ \sin(u-\omega)&=\cot L\tan\delta',\end{aligned}$$

which may be substituted in (10). But, as $u-\omega$ has necessarily to be computed, it may be more convenient to use the equations unchanged.

The expression (6) for $\varDelta$ contains not only x and y, but their derivatives with respect to the time, which are multiplied by the interval $t-\tau$. Since we can choose the time τ as near as we please to the moment of passage of the shadow, we may make the effect of these terms as minute as we please; but, owing to the extreme slowness with which $u-\omega$ changes, the effect of $\delta\lambda$ and $\delta\beta$ on the derivatives of x and y will under all circumstances be insensible, while the minuteness of the correction to the parallax will render the derivative of the last term of δx and of δy inappreciable. We may therefore suppose

$$\begin{aligned}\delta\frac{dx}{dt}&=\frac{d\,x}{dt}=0,\\ \frac{dy}{dt}&=\frac{d\delta y}{dt}=0.\end{aligned}$$

We have next to investigate the changes which may be produced in ξ and η by changes in the relative positions of the sun and moon. The change in d will be very nearly that in the sun's declination, which can scarcely exceed 20″ within historic times, and 2″ within the last two or three centuries. These changes would correspond respectively to 2000 feet and 200 feet on the earth's surface, and may therefore be neglected. The changes in ξ and η will therefore depend upon those of μ', or of the hour-angle of the line joining the centres of the sun and moon. If we represent by E the equation of time, and by t_1 the local mean time, the value of μ' is

$$t_1-E+c\sin\omega\sec\delta;$$

or if, for the moment, we represent the west longitude of the point of observation by λ_1, the value for the assumed time will be

$$\mu'=\tau-\lambda_1-E+c\sin\omega\sec\delta.\qquad(10)$$

Of these quantities, τ, the absolute time for which the computation is made, is arbitrarily assumed, and is not subject to correction, the actual time having been eliminated from the expression (6) for Δ; λ_1, the longitude of the place, is necessarily supposed to be known; the error of E cannot exceed a few seconds; its effect is therefore insensible; while c is so small and well determined that the changes in the last term of the expression are insensible. We may therefore consider ξ and η to be unaffected by any changes in the lunar and solar elements.

It appears, then, that to find the change in Δ we need only change x and y. We therefore obtain from (6)

$$\delta\Delta = \frac{X'\,\delta y - Y'\,\delta x}{\sqrt{X'^2 + Y'^2}},$$

or, for the differential coefficients, using equations (10) and putting ω for ω',

$$\sin\Pi\frac{d\Delta}{d\lambda} = \sin\Pi\left(\frac{d\Delta}{dx}\frac{dx}{d\lambda} + \frac{d\Delta}{dy}\frac{dy}{d\lambda}\right)$$

$$= \frac{X'\sin(u-\omega) - Y'\cos(u-\omega)}{\sqrt{X'^2 + Y'^2}};$$

$$\sin\Pi\frac{d\Delta}{d\beta} = \frac{X'\cos(u-\omega) + Y'\sin(u-\omega)}{\sqrt{X'^2 + Y'^2}};$$

$$\sin\Pi\frac{d\Delta}{d\Pi} = \frac{\gamma}{\sin\Pi}\cdot\frac{Y'\sin\omega' - X'\cos\omega'}{\sqrt{X'^2 + Y'^2}}.$$

The most convenient formulæ for computation will be:—

$$\tan S = \frac{Y'}{X'},\ (90^\circ > S > -90^\circ).$$

$$\frac{d\Delta}{d\gamma} = \frac{\sin(u-\omega-S)}{\sin\Pi}. \qquad (12)$$

$$\frac{d\Delta}{d\beta} = \frac{\cos(u-\omega-S)}{\sin\Pi}.$$

$$\frac{d\Delta}{d\Pi} = -\frac{\gamma\cos(\omega-S)}{\sin^2\Pi}.$$

In these expressions, the unit of Δ is the earth's equatorial radius, and that of λ and β is the unit radius of arc. It will be remembered that Δ is here the smallest perpendicular distance of the place from the centre of the shadow, and must not be confounded with the corresponding distance measured on the surface of the earth.

If nothing more is known of an eclipse than that it was total at a given place, Δ may have any value less than the radius of the shadow. We cannot then form an absolute equation of condition, but can only assign two limits within which a certain linear function of the corrections $\delta\lambda$ and $\delta\beta$ must be contained. The following formulæ are sufficiently accurate for this purpose. Compute the angle of the cone of the shadow by the formula

$$\log\sin f = \frac{[7.66669]}{r'\{1 - m\cos(\gamma + c)\}};$$

f being the angle in question, and r' the distance or radius vector of the sun, its mean distance being unity as given in the ephemeris. The formula

$$\log \sin f = \frac{[7.6678]}{r'}$$

will answer for all practical purposes. Compute also the distance of the moon's centre from the fundamental plane,

$$z = \frac{\cos (\gamma + c)}{\sin \varPi};$$

and compute the value of $\mathfrak{z}$ for the place from the third of formula (3). Then we have

$$\rho_1 = (z - \mathfrak{z}) \tan f - 0.27227 \sec f; \qquad (13)$$

ρ_1 being the radius of the shadow. If now $\varDelta_0$ represent the tabular distance at which the axis of the shadow passes, as given by formula (6), the value of $\varDelta_0 + \delta\varDelta$ must be contained between the limits $+\rho_1$ and $-\rho_1$. The expression for this function is

$$\varDelta_0 + \frac{d\varDelta}{d\lambda}\delta\lambda + \frac{d\varDelta}{d\beta}\delta\beta + \frac{d\varDelta}{d\pi}\delta\pi.$$

The condition sought is therefore

$$\rho_1 - \varDelta_0 > \frac{d\varDelta}{d\lambda}\delta\lambda + \frac{d\varDelta}{d\beta}\delta\beta + \frac{d\varDelta}{d\pi}\delta\pi > -\rho_1 - \varDelta_0.$$

We have now to introduce, in place of λ and β, the mean longitudes of the sun and moon and the longitude of the moon's node. Introducing the notation of the preceding article, where we have put

ε, the moon's mean longitude;
l, its true geocentric longitude;
(l'), the motion of its true longitude in minutes of arc in $0^d.01$; and
θ, the longitude of its node;

we shall then have

$$\delta\lambda = \delta l - \delta L = \frac{(l')}{7.90}\delta\varepsilon - \delta L;$$
$$\delta\beta = \sin i \sec \beta \cos (l - \theta)(\delta l - \delta\theta)$$
$$= \sin i \sec \beta \cos (l - \theta)\left(\frac{(l')}{7.90}\delta\varepsilon - \delta\theta\right).$$

In the case of a central eclipse of the sun, we may put $\sec \beta \cos (l - \theta) =$ positive unity when the eclipse occurs near the ascending node, and negative unity when it occurs near the descending node, without an error of more than $\frac{1}{50}$ of the whole coefficient, and may take $\pm .995$ as its mean value. We may also suppose $\sin i = .090$. The value of $\delta\beta$ will then become

$$\delta\beta = \pm .0895\left(\frac{(l')}{7.90}\delta\varepsilon - \delta\theta\right).$$

Substituting these expressions for $\delta\lambda$ and $\delta\beta$ in the expression for $\delta\varDelta$, we find

$$\delta\varDelta = \frac{l'}{7.90}\left(\frac{d\varDelta}{d\lambda} \pm .0895\frac{d\varDelta}{d\beta}\right)\delta\varepsilon \mp .0895\frac{d\varDelta}{d\beta}\delta\theta + \frac{d\varDelta}{d\varPi}\delta\varPi - \frac{d\varDelta}{d\lambda}\varDelta L, \qquad (14)$$

in which the differential coefficients are to be taken from (12). This equation gives the condition which must be fulfilled by the corrections to the elements in order that the path of the shadow may be thrown to the north by the quantity $\delta\varDelta$.

The upper sign is to be used when the eclipse occurs at the ascending, the lower when it occurs at the descending node.

In this formula, we tacitly suppose the error of the moon's true longitude to arise only from that of its mean longitude, and neglect the effect of possible errors of the eccentricity and perigee. In practice, the datum which we are considering will be used only to determine the correction to the longitude of the node; but to do this, the correction to the true longitude must be supposed known. The mode of expressing this must depend on circumstances, and that which we now adopt is that to be used for the older eclipses.

§ 8.

OBSERVATIONS OF BULLIALDUS AND GASSENDUS.

The authorities for these observations are the printed works of the authors, namely:—

BULLIALDUS, *Astronomia Philolaica.* Paris, 1645.

GASSENDUS, *Opera, Tome IV, Commentarii de Rebus Coelestibus.*

I believe we must accord to BULLIALDUS the honor of being the first to actually observe the time of an occultation with a telescope. We begin with his observations. The times have been deduced from the observed altitudes, using the mean places of the stars given on the next two pages. The geographical positions of the places of observation of the two observers have been adopted as follows:—

Latin Name.	Modern Name.	Latitude.	Long. from Greenwich.	log ρ sin ϕ'.	log ρ cos ϕ'.
		° ′	m s		
. . . .	Paris . . .	48 52	9 21 E.	9.8747	9.8192
Juliodunum Lodunum	Loudon . .	47 1	0 20 E.	9.8622	9.8344
Dinia . .	Digne . .	44 5	24 57 E.	9.8403	9.8570
Aquæ Sextiæ	Aix . . .	43 32	21 47 E.	9.8358	9.8610

It will be remembered that in making these observations the observers used no clock, but determined their time by observing the altitude of some well-determined object at the moment of the phenomenon. The star-positions used in reducing the observed altitudes of all the observers whose work is discussed in the following sections are shown in the following table. No refinement has been aimed at in their derivation, nor have the places been corrected for nutation and aberration. All the corrections which should be applied are completely masked by the probable errors of the observed altitudes.

Approximate Positions of Stars for Clock-error, carried back from the Positions of LE VERRIER.

(*Annales*, ii, p. [63].)

α ANDROMEDÆ.

Year.	Right Ascension.			Declination.		
	h	*m*	*s*	°	′	
1650	23	50	25.48	+ 27	9.5	
1700		52	58.11		26.0	
1750		55	31.17		42.5	
1800	23	58	4.66	27	59.1	
1850	0	0	38.58	28	15.7	
1900	0	3	12.93	+ 28	32.3	

α ARIETIS.

Year.	Right Ascension.			Declination.		
	h	*m*	*s*	°	′	″
1600	1	44	49.23	+ 21	31	46.7
1650		47	35.13	21	46	37.7
1700		50	21.51	22	1	22.7
1750		53	8.40		16	1.7
1800		55	55.78		30	34.8
1850	1	58	43.65		45	1.9
1900	2	1	32.02	+ 22	59	23.1

α CETI.

Year.	Right Ascension.			Declination.		
	h	*m*	*s*	°		
1650	2	44	3.1	+ 2	40.9	
1700		46	38.7	2	53.3	
1750		49	14.5	3	5.6	
1800		51	50.4		17.8	
1850		54	26.5		29.9	
1900	2	57	2.9	+ 3	41.8	

ALDEBARAN.

Year.	Right Ascension.			Declination.		
	h	*m*	*s*	°	′	″
1600	4	13	4.17	+ 15	37	37.4
1650		15	54.61		44	54.9
1700		18	45.32		52	1.0
1750		21	36.31	15	58	55.7
1800		24	27.57	16	5	39.0
1850		27	19.11		12	10.9
1900	4	30	10.92	+ 16	18	31.4

CAPELLA.

Year.	Right Ascension.			Declination.		
	h	*m*	*s*	°	′	
1600	4	47	18.16	+ 45	29.8	
1650		50	56.94		34.3	
1700		54	36.21		38.6	
1750	4	58	15.97		42.7	
1800	5	1	56.22		46.6	
1850		5	36.97		50.3	
1900	5	9	18.20	+ 45	53.8	

β ORIONIS.

Year.	Right Ascension.			Declination.
	h	*m*	*s*	
1650	4	57	45.0	. . . . . .
1700	5	0	8.5	. . . . . .
1750		2	32.1	. . . . . .
1800		4	55.9	. . . . . .
1850		7	19.8	. . . . . .
1900	5	9	43.8	. . . . . .

SIRIUS.

Year.	Right Ascension.			Declination.		
	h	*m*	*s*	°	′	
1650	6	29	43.2	− 16	17.1	
1700		31	55.5		20.2	
1750		34	7.8		23.5	
1800		36	20.1		27.1	
1850		38	32.4		30.8	
1900	6	40	44.7	− 16	34.7	

α ORIONIS.

Year.	Right Ascension.			Declination.		
	h	*m*	*s*	°	′	″
1650	5	36	14.57	+ 7	17	7
1700		38	56.59		18	44
1750		41	38.69		20	10
1800		44	20.86		21	24
1850		47	3.11		22	27
1900	5	49	45.43	+ 7	23	18

β TAURI.

Year.	Right Ascension.			Declination.		
	h	*m*	*s*	°	′	″
1600	5	1	5.11	+ 28	10	51
1650		4	13.38		14	50
1700		7	21.88		18	35
1750		10	30.61		22	7
1800		13	39.57		25	25
1850		16	48.77		28	30
1900	5	19	58.19	+ 28	31	21

PROCYON.

Year.	Right Ascension.			Declination.		
	h	*m*	*s*	°	′	″
1600	7	18	19.00	+ 6	10	50
1650		20	56.75	6	4	18
1700		23	34.41	5	57	35
1750		26	11.97		50	41
1800		28	49.44		43	36
1850		31	26.81		36	20
1900	7	34	4.09	+ 5	28	53

POLLUX.

Year.	Right Ascension.			Declination.		
	h	*m*	*s*	°	′	″
1600	7	20	43.08	+ 28	54	42
1650		23	48.62		48	47
1700		26	53.86		42	39
1750		29	58.81		36	19
1800		33	3.46		29	46
1850		36	7.81		23	1
1900	7	39	11.87	+ 28	16	3

REGULUS.

Year.	Right Ascension.			Declination.		
	h	*m*	*s*	°	′	″
1650	9	49	39.78	+ 13	39	1.9
1700		52	20.91		24	53.8
1750		55	1.77	13	10	39.6
1800	9	57	42.37	12	56	19.4
1850	10	0	22.70		41	53.2
1900	10	3	2.77	+ 12	27	21.2

Approximate Positions of Stars for Clock-error, &c.—Continued.

Year.	Right Ascension.			Declination.		
β LEONIS.						
	h	m	s	°	'	''
1600	11	28	35.17	+ 16	48	9.7
1650		31	9.40		31	29.1
1700		33	43.43	16	14	47.6
1750		36	17.25	15	58	5.1
1800		38	50.87		41	21.7
1850		41	24.28		24	37.3
1900	11	43	57.49	+ 15	7	52.0
SPICA.						
	h	m	s	°	'	''
1600	13	4	14.03	− 9	2	46.0
1650		6	50.24		18	51.7
1700		9	26.72		34	53.7
1750		12	3.47	9	50	51.9
1800		14	40.49	10	6	46.4
1850		17	17.77		22	37.1
1900	13	19	55.33	− 10	38	24.1
ARCTURUS.						
	h	m	s	°	'	
1650	13	59	43.0	+ 21	1.7	
1700	14	1	59.5	20	45.7	
1750		4	16.0		29.7	
1800		6	32.6	20	13.8	
1850		8	49.2	19	57.9	
1900	14	11	5.9	+ 19	42.2	
α CORONÆ BOREALIS.						
	h	m	s	°	'	
1650	15	19	53.1	+ 27	55.6	
1700		21	59.8		44.9	
1750		24	6.6		34.3	
1800		26	13.4		23.7	
1850		28	20.3		13.4	
1900	15	30	27.2	+ 27	3.1	

Year.	Right Ascension.			Declination.	
α LYRÆ.					
	h	m	s	°	'
1650	18	25	5.8	+ 38	29.5
1700		26	47.2		31.7
1750		28	28.6		34.0
1800		30	10.1		36.3
1850		31	51.6		38.8
1900	18	33	33.2	+ 38	41.4
α AQUILÆ.					
	h	m	s	°	'
1650	19	33	41.91	+ 7	59.2
1700		36	8.44	8	6.4
1750		38	34.94		13.7
1800		41	1.40		21.0
1850		43	27.83		28.6
1900	19	45	54.22	+ 8	36.2
α CYGNI.					
	h	m	s	°	'
1650	20	29	31.00	+ 44	3.4
1700		31	12.95		13.6
1750		32	54.96		23.9
1800		34	37.02		34.3
1850		36	19.14		44.8
1900	20	38	1.31	+ 44	55.4
α PEGASI.					
	h	m	s	°	'
1650	22	47	22.06	+ 13	20.0
1700		49	50.74		35.9
1750		52	19.54	13	51.9
1800		54	48.47	14	7.9
1850		57	17.52		24.0
1900	22	59	46.70	+ 14	40.1

Observations of BULLIALDUS.

From *Astronomia Philolaica*, p. 159.

Anno 1623 Julij die 5 cum Lunae centrum altum esset g. 17⅓ Parisiis observavi occultationem Spicae Virginis à ☽.

BULLIALDUS adds that the moon appeared 13′ north of the star in latitude; and having thence computed its position, he adds:—"fuit Hora Parisiis ex altitudine Spicae g. 17.7′. post meridiem ix. 30′." There is therefore some doubt whether the actual observation of altitude was made on the moon or on Spica. The correspondence between the difference of altitudes and difference of latitude is somewhat suspicious. The apparent places of the two objects are, as a first approximation:—

Spica, A. R. $= 13^h\ 5^m\ 27^s$; Dec. $= -\ 9^\circ\ 10'$.
Moon, A. R. $= 13^h\ 4^m\ 40^s$; Dec. $= -\ 8^\circ\ 46'$.

The place of the moon is that computed from HANSEN'S Tables for $9^h\ 33^m\ 37^s$ Paris time, and corrected for parallax.

The local times thence deduced are:—

		Sid. T.	M. T.
From alt. of Spica,	17° 7′,	Sid. T. $= 16^h\ 27^m\ 15^s$;	M. T. $= 9^h\ 33^m\ 18^s$.
Moon,	17° 20′	$16^h\ 26^m\ 58^s$;	$9^h\ 33^m\ 1^s$.

The results agree well enough, but the fact is that at this time the tables, which cannot be 3′ in error, show the apparent distance of the centre of the moon and Spica at this time to have been about 28′, so that the star must have been some 13′ distant from the moon's dark limb. The moon was then a few hours past her first quarter. Moreover, the moon was about 20′ north of the star in latitude, so that there could not have been an occultation at all. Indeed, a careful reading of BULLIALDUS'S deductions from his observation seems to indicate that he considered the two bodies to have the same longitude at the moment of the observation. Now, we must adopt one horn of this dilemma: either (1) we have to deal with such a blundering observer that he thought a star at the moon's limb when it was 23′ distant, and in conjunction when the difference of longitude was some 20′, and that when the dichotomized position of the moon was most favorable to the observation; or (2) he made a mistake in reading his altitude from the quadrant, and a consequent error of some 40^m in his computed time. The latter seems likely to be the correct explanation.

GASSENDUS at Digne was more successful. At the time when the altitude of Spica was 10° 46′ (local mean time, $10^h\ 32^m\ 40^s$), he says Spica was in the same right line with the cusps of the moon, the space being apparently equal to the diameter of Arcturus. This was 45^m in absolute time later than the observation of BULLIALDUS. On the whole, we can do nothing with this observation.

The next occultation is one of α Leonis, 1627, June 17, and is quoted by GASSENDUS as follows:—

> Eandem Occultationem Ismael Bullialdus observavit Loduni (quod oppidum Pictanio est directè in Boream ac distat ab eo leucis usualibus 10 seu Germanicis 6½) hora 9 min 33 cum mempe ☽ a vertice foret 73 grad. 32 min. Nota Polarem elevationem illeic esse 48° 1′.

From the description, this place must be Loudon, the latitude assigned being 1° in error. It should be 47° 1′.

The altitude gives:—

Local mean time of occultation	$9^h\ 29^m\ 42^s$
Greenwich mean time	$9^h\ 29^m\ 22^s$.

> Page 163.—Anno 1634. Julioduni apud Pictones cuius Meridianus removetur a Parisiensi occasum versus, quadrante fermè horae unius, observavi occultationem anguli orientalis quadrilateri Pleiadum quae & lucida Pleiadum dicitur interventu Lunae factam Decembris die 30 in distantia oculi Tauri à vertice p. 57. 18′. Hor. 5. 42′ vespere.

The position of Loudon is $\varphi = 47°\ 1'$; $\lambda = 0^m\ 20^s$ east from Greenwich. The position of α Tauri was R. A. $= 4^h\ 15^m\ 3^s$; Dec. $= +15°\ 43'$. We hence find:—

Hour-angle	$-3^h\ 54^m\ 30^s$
Sidereal time	$0^h\ 20^m\ 33^s$
Local mean time	$5^h\ 44^m\ 4^s$
Greenwich mean time	$5^h\ 43^m\ 44^s$.

Page 166.—Anno 1639. Aprilis die 7. in altitudine Procyonis g. 33. 52.′ Parisiis, id est Hor. 9. 8.′ T. A. Uraniburgi H. 9. 56.′ T. A. at medio H. 9. 54.′ vidi Lunam limbo obscuro occultare stellam quintae magnitudinis, quae est in origine cornu Borealis Tauri.

The result of the altitude of Procyon is:—

Local mean time	$9^h\ 9^m\ 42^s$
Local sidereal time	$10^h\ 13^m\ 13^s$
Greenwich mean time	$9^h\ 0^m\ 21^s$.

The star occulted is τ Tauri.

Page 167.—Anno 1641. Aprilis die 13 alto versus occasum Humero Dextro Orionis g. 24 0′. Hor. 8. 8′ Parisiis, Luna mihi occultavit oculum Boreum ♉. (Locus Tychon ♊ g. 3. 27′.)

The resulting local times are:—

Sidereal	$9^h\ 42^m\ 7^s$
Mean	$8^h\ 13^m\ 4^s$.

The occulted star is ε Tauri.

Eclipses and occultations observed by GASSENDUS.

1621. Mense Maio, Die 20. (seu ut vulgus numerat, die 21. Manè) Eclipsin Solis hanc observabam Aquis-Sextiis. Modus autem Observationis fuit huiusmodi. Trajiciebantur Radii Solares in cameram ritè occlusam per probatum Telescopium foramini idoneo in suprema fenestra apparatum et fulcro ad motus positusque varios accommodato impositum.

Aderat ibi Germanus meus, qui Telescopium motitando, circellum lucis in concavo, seu inferiore vitro apparentem continuo restitueret, destineretque in medio.

Excipiebam ego Radios afferre plano solido, papyro candida obducto. Duxeram in eo Circulum, in quem radii cogerentur, ut in ellipsin non excurrerent. Diametrum pede Parisiensi aliquanto majorem diviseram in parteis aequaleis, seu Digitos 12. & quemlibet Digitum ita subdistinxeram in denas & quinas parteis, ut liceret etiam singula minuta per interstitia colligere.

Utramque etiam semi-circumferentiam in 180. parties distribueram (initio utriusque divisionis facto ab ipsa Radice primi digiti.) tum ut in magna occultatione liceret semper, usurpata heinc inde aequali ad interfectiones Circulorum lucis, & umbrae distantia, cogere radios in Circulum & nimorem maximum umbrae in Diametrum rejicere; tum ut exinde Diametrorum utriusque astri apparentium haberi posset mutua proportio.

Aderat praedictus Galterius in proxima Camera, assidue sectatus Solis altitudinem Quadrante Radii plusquam bipedalis. Erat verò penes me, qui statim atque appareret obscurationis vestigium, ictu parieti impacto, momentum ipsi significaret. Quare hoc signo notavit praecisè Solis altitudinem initio Eclipseos; neque ratione absimili eandem accuratè accepit in fine, seu quo momento obscuratio ex circulo prorsùs evanuit.

Omnibus ergo apprimè instructis, observaturi adfuimus ab hora circiter 6. ita scilicet verebamur, ne fallente calculo initium praeterlaberetur. Cumque ⊙ tempore Eclipseos supponatur fuisse in 0. grad. 15. min. ♊ apparvit nobis praedicta die 20. Eclipseos. Initium hora 19. min. 5. sec. 28. elevato nempe ⊙ 25. grad. 30. min.

Finis hora 21. min. 31. sec. 12. elevato scilicet ⊙ 51. grad. 17. min.

Ac medium proinde contigit hora 20. min. 18. sec. 20.

Et tempus incidentiæ fuit hora 1. min. 12. sec. 52.

Et tota duratio horarum 2. min. 25. sec. 14.

Digiti ecliptici maximae obscurationis fuerunt 9. min. 23.

Et quia tum deficiebant utrimque ex circumferentia gradus 77. min. 30. heinc aequales visae arguuntur Luminarium Diametri.

Fuit Luna Soli Septentrionalis; quod circulos nobis citra telescopium temerari caeperit ad Austrum.

Fuit Coelum interspersum totum tempore Eclipseos rarioribus nubilis. Juvabant illa ut ☉ posset conspici oculo ferè inconniventi, & specillo quidem maximè. Conspectus verò est etiam innoxiè tum in speculo, tum in aqua limpida; cum utrobique tres viderentur exhiberi Soles, quasi tres Lunae corniculatae ex ordine positae, versis cornibus ad Occasum.

The altitudes give:—

Local mean time of beginning . . $19^h\ 1^m\ 37^s$; of end, $21^h\ 27^m\ 17^s$
Greenwich mean time of beginning . $18^h\ 39^m\ 50^s$; of end, $21^h\ 5^m\ 30^s$.

1627. Mense Junio, Die 17. Vesperi, hanc occultationem Cordis Leonis à Luna observabam Diniae, cùm scilicet foret Cauda ♌ alta ad Occasum 25. grad. 13. min. hoc est, hora 10. min. 30. praecisè (utebar dicto iam antè Quadrato, cuius umbra recta, seu tangens exhibuit parteis 4710) Luna, tum corniculata limbo suo Orientali, seu parte obscura Cor. ♌ subiit.

Porrò tum tectura triente à cornu inferiori; tandem verò texit non multò ampliùs quadrante.

Observata est autem non nudo solùm visu, quo Stella videbatur Lunam, quasi adrependo, radere; verùm etiam per Telescopium, quo distantiola quaeque ad occultationem usque distinctè percepta est.

The altitude of β Leonis gives:—

Local mean time of occultation . . . . $10^h\ 30^m\ 0^s$
Greenwich mean time . . . . $10^h\ 5^m\ 3^s$.

1630. Caeterum copiam à Schickardo nostro tibi iam existimo factam meae illius observationis circa Eclipsin Solis nuperam diei 10. Junii.

Page 545—Nisi fuerit, scito nobis in hac Civitate (cujus latitudo est 48. grad. 52. min.) illius initium contigisse Sole ad occasum alto grad. 14. min. 40. seu horâ post meridiem 6. min. 16½. Finem videre non potuisse, proper Solis occubitum, cùm duorum propè digitorum foret adhuc obscuritas. Medium, quatenus licuit, observatum proximè fuisse Sole adhuc elevato grad. 6. min. 20. seu horâ circiter 7. min. 12.

The place of observation was Paris. The altitude gives:—

Local mean time of beginning . . . . June 10, $6^h\ 15^m\ 1^s$
Greenwich mean time of beginning . . . . . June 10, $6^h\ 5^m\ 40^s$.

Page 547.—1632. Februarii, die 5.—Credebam etiam facilè fore, ut Luna duntaxat Martem stringeret: nisi quod ad constitutionem Poli Eclipticae respiciens, non omninò desperabam, quin vel tantillum occultaret. Nec vero vana fuit spes. Siquidem iam sub hor. 3. cùm plurimum illi quasi adrepsisset, ac Mars proxime accessisset ad verticalis Lunae planum, tum demum Luna Martem occuluit. Contigit ista occultatio, cùm limbus illae Lunae supremus foret altus ad occasum grad. 44. min. 17. & eodem tempore Arcturus foret altus ad exortum grad. 56. min. 10. Expectato posteà egressu, etsi vapores iam fuerant longè ampliùs densiores facti, variegataque irradiatio circum Lunam diffundebatur; apparvit tamen emergens in multa iam inclinatione ultra planum verticalis, cùm idem limbus Lunae supremus esset altus ad occasum gr. 39. min. 57. eodemque momento ad ortem foret Lucida Lyrae alta grad. 31. min. 54.

The observations give:—

Immersion, from altitude of Arcturus, Local M. T. $15^h\ 18^m\ 39^s$; G. M. T. $15^h\ 9^m\ 18^s$.
Emersion, from altitude of α Lyræ, Local M. T. $15^h\ 47^m\ 31^s$; G. M. T. $15^h\ 38^m\ 10^s$.

Eclipse of 1633, *April* 8, *observed at Digne.*

Phases Eclipseos.	Quantitas Defectus.		Gradus hinc inde deficientes	Gradus inclinatio. Diametrorum ad Vertic.	Alt. ☉ in partibus.	Id est.		Seu respectu habito tum refr. tum parallaxeos.		Unde colligitur fuisse.		Proportio Diametri ☾ ad Diametr. ☉ Sit ☉. Sem. 15. m. 20. sec. & Sem. ☾	
	dig.	m.	gr. m.		V. R.	gr.	m.	grad.	min.	hor.	min.	min.	sec.
1.	4.	30.	50.	.	5150.	25.	15.	27.	12.	3.	56.	15.	2.
2.	5.	42.	58.	.	. .	.	.	.	.	.	.	15.	0.
3.	7.	0.	65.	32.	4050.	22.	3.	22.	0.	4.	26.	15.	8.
4.	7.	30.	68.	38.	3950.	21.	33.	21.	29.	4.	29.	15.	8.
5.	8.	6.	70.	50.	3800.	20.	48.	20.	43.	4.	33½.	15.	17½.
6.	8.	12.	71.	60.	3720.	20.	24.	20.	19.	4.	36.	15.	15.
7.	8.	18.	72.	62.	3540.	19.	30.	19.	25.	4.	41.	15.	12.
8.	8.	18.	73.	72.	3450.	19.	2.	18.	56.	4.	43½.	15.	7.
9.	8.	6.	70.	85.	3300.	18.	16.	18.	9.	4.	48.	15.	17½.
10.	7.	42.	68.	107.	3030.	16.	51.	16.	44.	4.	56.	15.	15.
11.	7.	30.	67.	112.	2920.	16.	17.	16.	9.	4.	59.	15.	15.
12.	7.	12.	65.	117.	2850.	15.	54.	15.	46.	5.	1.	15.	17.
13.	6.	48.	64.	122.	2800.	15.	39.	15.	31.	5.	3.	15.	7.
14.	6.	36.	62.	125.	2750.	15.	23.	15.	15.	5.	4.	15.	12.
15.	6.	12.	60.	128.	2670.	14.	57.	14.	48.	5.	7.	15.	10.
16.	5.	30.	55.	132.	2560.	14.	22.	14.	13.	5.	10.	15.	12.
17.	5.	18.	53.	134.	2450.	13.	46.	13.	37.	5.	13.	15.	15.
18.	5.	0.	52.	136.	2350.	13.	13.	13.	4.	5.	16.	15.	10.
19.	4.	30.	50.	138.	2260.	12.	44.	12.	35.	5.	19.	15.	2.
20.	4.	18.	48.	140.	2230.	12.	34.	12.	25.	5.	20.	15.	5.
21.	3.	42.	45.	141.	2160.	12.	11.	12.	1.	5.	22.	15.	6.
22.	3.	0.	39.	142.	2060.	11.	38.	11.	28.	5.	25.	15.	2.
23.	2.	42.	37.	143.	2000.	11.	19.	11.	9.	5.	27.	15.	2.
24.	2.	0.	35.	145.	1900.	10.	45.	10.	34.	5.	30.	14.	52.
25.	1.	36.	30.	147.	1740.	9.	52.	9.	41.	5.	35.	14.	57.
26.	0.	54.	20.	148.	1600.	9.	5.	8.	54.	5.	93½.	15.	10.
27.	Finis.		0.	150.	1420.	8.	5.	7.	53.	5.	45.	.	.

The results of the observations will be given in discussing the eclipses.

1635. Aug. 26.—Occultatio praecedentis duarum Caudae ♑ à ☾. quia Keplerus monuerat fore ut ☾ Stellas Caudae ♑ tegeret nobis, idcirco attendendum duxi quid hac de re contingeret. Et nubes quidem perexiguam reliquerant spem quicquam observandi, ac potissimum circa praecedentem duarum ♑ in tanta ☾ vicinia, ob illius exilitatem; verùm tametsi obstiterunt, quo minus relicta à ☾ detegi usquam potuerit, permisere tamen ipsius conspectum, quo momento obtegi coepit. Variè, ac non sine labore sectatus illam fueram etiam maximo Telescopio, ob universi propemodum aëris nubilositatem; sed favore eximio distinctissimè visa est à sensibili interstitio, quousque paenè. contigua fuit illustrato margini orientali ☾ ultra quem (adhuc asperatum) tantillum supererat marginis illius obscuri, praeter quem facta tandem est.

Luna itaque subiit Stellam è regione superioris partis Maculae grandiusculae, & aliquatenus rotundae, quae est ad laevam umbilici, hoc est infra medium orientalis marginis parte fere duodecima totius ambitus Lunaris.

Fuit autem tunc lucida ♈ jam elevata ad Ortum 3350. seu 18. grad. 31. min. unde proditur hora 9. min. 47. Fuit & margo superior ☾ altus 4940. seu 26. gr. 17. min. ac proinde Stella occultata 25. grad. 57. min. proximè, unde proditur hora 9. min. 50½. Fuit denique altitudo Capitis Andromedae 9400. seu 43. grad. 14. min. unde proditur hora 9. min. 50. crediderim horam 9. min. 49,

The results from the three altitudes of stars are:—

From δ Arietis: Local mean time, $9^h\ 47^m\ 49^s$; hour-angle, $-\ 5^h\ 39^m\ 33^s$.
From α Andromedæ: Local mean time, $9^h\ 52^m\ 25^s$; hour-angle, $-\ 3^h\ 39^m\ 29^s$.
From γ Capricorni: Local mean time, $9^h\ 57^m\ 34^s$; hour-angle, $-\ 1^h\ 4^m\ 24^s$.

The most probable mean time, $9^h\ 50^m\ 12^s$.

Occultations of the Pleiades.

1637. Mart. die 29. Aquis Sextiis.—Tum quia ☾ jam evadebat Stellae propinqua admodum divertere alio non placuit. Itaque jussus est Agarratus assiduè sectari altitudinem ipsius Aldebarae dum ipse Telescopio ad occultationem attendo. Caeterùm

Occultatio Stellae anguli occidui in □ Pleiadum contigit, cùm altitudo Aldebarae foret 20. grad. 55 min. ac proinde hora 8. min. 44.

Occultatio Stellae anguli Borei in □ Pleiadum contigit cùm Aldebarae altitudo foret 14. grad. 50. min. ac proinde hor. 9. min. 19. consequenter autem fuit altitudo ☾ superiore margine 10. grad. 50. min. & lucidae Pleiadum 11. grad. 0. min. atque adeo hora . min. .

Occultatio Stellae anguli Austrini in □ Pleiadum contigit, cùm Aldebarae altitudo foret 13. grad. 10. min. ac proinde hor. 9. min. 26. & Stellae in extremo cornu Boreo ♉ 29. grad. 30. min. seu hora . min. . Fuit & consequenter altitudo ☾ 9. grad. 25. min.

Occultatio Stellae anguli ortive in □ seu lucidae Pleiadum contigit cùm altitudo extremi cornu Borei ♉ foret 26. grad. 35. min. ac proinde hor. 9. min. 45. fuit consequenter altitudo Aldebarae 10. grad. 10. min. unde hora . min. . & consequenter ☾ 6. grad. 50. min.

The altitudes give:—

Immersion of Electra; Alt. of Aldebaran: Local mean time, $8^h\ 48^m\ 58^s$.
Immersion of Maja; Alt. of Aldebaran: Local mean time, $9^h\ 22^m\ 47^s$.
Immersion of Maja; Alt. of η Tauri: Local mean time, $9^h\ 23^m\ 18^s$.
Immersion of Merope; Alt. of Aldebaran: Local mean time, $9^h\ 32^m\ 3^s$.
Immersion of Merope; Alt. of β Tauri: Local mean time, $9^h\ 33^m\ 10^s$.
Immersion of η Tauri; Alt. of β Tauri: Local mean time, $9^h\ 49^m\ 41^s$.
Immersion of η Tauri; Alt. of Aldebaran: Local mean time, $9^h\ 48^m\ 57^s$.

1638. Januario. Die 24.—Vesperi, appulsus, & occultatio Pleiadum à ☾ luctandum quidem fuit cum vento, sese ob nimiam violentiam quoquoversum insinuante, itemque cùm eo frigore, quo intensius meminit nemo; sed non licuit spectaculum dimittere inobservatum. Paucis itaque ☾ transiit proximè angulum occiduum △ Pleiadum suo angulo Boreo, cum distantia quanta apparuit inter superiorem ejus limbum & nigrescentem Phaseolum, seu parte diametri Lunaris quasi $\frac{1}{10}$. idque alto proximè Polluce ad ortum 45. grad. 0. min. hoc est hora 7. min. 23.

☾ texit angulum Austrinum △ Pleiadum parte obscura, diametrique suae quasi $\frac{4}{9}$. à Boreo sui angulo, nempe è regione globuli illius majoris, quem Carthusiam dicere soleo, aut tantillum inferius; idque Polluce alto 46. grad. 30. min. hoc est hora 7. min. 31.

☾ texit lucidam Pleiadum, seu angulum △ ortiuum parte diametri quasi $\frac{1}{5}$. à Borea sui cuspide, scilicet in medio superioris maris. Erat autem tunc Lucida in ore ♌ alta 32. grad. 15. min. (Pollux quippe incommodè deinceps observabilis, divergereque cogebat ventus) hoc est hora 7. min. 52.

We have from the altitudes:—

Immersion of Merope; alt. of Pollux: Local mean time, $7^h\ 39^m\ 34^s$.

The certain identification of the other star offers difficulty:—

If the star be α Leonis, we have local mean time about $9^{h}\ 30^{m}$ (too late).
If the star be $\varkappa$ Leonis, we have local mean time about $8^{h}\ 4^{m}\ 27^{s}$.
If the star be λ Leonis, we have local mean time about $8^{h}\ 22^{m}\ 29^{s}$.
If the star be ε Leonis, we have local mean time about $8^{h}\ 35^{m}\ 10^{s}$.

Occultation of μ Geminorum observed at Digne.

1638. Decembri. Die 21.—Ceterum cum ☾ jam prorsùs exueret superstite millam obtenebrationem in situ paenè heic descripto, ita promota intereà fuit versus eam Stellam, quae est in extremo pede Castoris, anteceditve aliam in pede procedentis ♊, ut illam media subierit, terraeque eripuerit, quae mox ante ipsi eripuerat Solem; scilicet ipsam occuluit paulò infrà maculam parvam quam initio in parte ☾ orientali descripsimus, ac tanto quidem intervallo, quantum macula longa est; adeò ut locus fuerit quasi medius inter primam defectionem, & recuperationem lucis.

Fuit autem tunc humerus dexter Orionis ad Occidentem adhuc altus 285. seu 15. grad. 54. min. atque idcirco exstitit hora 16. min. 37.

The altitude gives:—

Local mean time, $16^{h}\ 36^{m}\ 34^{s}$; Greenwich mean time, $16^{h}\ 11^{m}\ 37^{s}$.

Eclipse of the Sun observed at Aix, 1639, *June* 1.

1639. Mense Junio, Die 1. A meridie, Eclipsis ☉. Fuerat Coelum vespere toto Diei 30. obscurum; à meridie verò diei 31. etiam pluvium.

Hoc manè varium existit, à meridie potius serenum. In ipso meridie famulus attendens ad ☉ altitudinem, deprehendit illam quadrante ligneo pedum prope trium, quo usurus eram, 68. grad. 38. min. unde quia ☉ fuit in 16. grad. 36. min. ♊ cum declinatione Boreas 22. grad. 7. min. colligitur altitudo Poli 43. grad. 36. min. major aequo tribus, vel 4. minutis. Apparata intereà est scena in supremo Solario, unde Eclipsis observaretur, inductàque in eam machina, qualem Diniae quoque habueram circa Eclipsin anni 1633. heinc par fuit observandi modus, sed non aequa felicitas propter usurpatum Telescopium majus, quod speciem Solis in circulo tremulam nimis exhibuit, propterque ipsam machinam, quae non satis aequabilis secundum omnem motionem fuit. Effectum nempe exinde est, ut tametsi Corberanus dirigeret machinam, ipse circulum temperarem, adjutarentque etiam viri in civitate principes, (alias profectò importuni) in adnotandis partibus tum ipsius diametri, quà umbrae Lunaris maximus tumor pertingebat, tum circumferentiae, qua heinc inde arcus conspicuus eiusdem umbrae intersecabat; nihilominus species Solis extremorum mobilitate oculos saepè deluserit et partibus hujusmodi non satis constanter designatis, diametrorum proportio aucupari potissimùm expetieram, prodita fuerit inconstanter.

Non distinxeram porrò diametrum in duodenos digitos, digitorùmque minuta: sed in parteis 100. & duplatione in 200. ut ex radio supposito 100. vel ampliatione 100000. calculus esset brevior ad retexendum eam proportionem cùm & reductio in digitos futura esset perfacilis. Jam & famulus extra scenam attendit continuò ad altitudinem ☉ decrescentem, ipse intereà continuò attendi ad oppositum Soli circulum (interposui etiam plerumque candidissimam papyrum) ab hora paene tertia ne, si foret praeccupatio, initium invisum praeterlaberetur. Tantum verò abfuit ut tempus praeoccupatum fuerit quin retardatius longè fuit, quam omnes sive Tabulae, sive Ephemerides indicarent. Praetereo autem per id tempus nullam extitisse maculam in ☉. Cum primùm porro circulus temerari sursum ad dextram est visus, requisivi ex famulo Solis altitudinem. Respondit ipse momento post eam esse 28. grad. 30. min. unde indicata est hora 4. min. 44½. quia vero inter dignoscendum num esset vel quaedam marginis inaequalitas, vel umbra ☾ subiens (adde & inter respondendum) tantum temporis est elapsum, ut tantillus intereà defectus occupare potuerit $\frac{1}{200}$. diametri; idcircò visum est initium posse exquisitè referri ad hor. 4. min. 44. en nunc seriem observationis, cum deductis per calculum.

Partes 100. diametri deficientes.	Seu ex reductione in digitos et minuta.		Gradus circumferentiae heinc inde deficientes.	Unde colligitur diam. partium ☾ 100.	Et diam. ⊙ supposita 30. m. 24. sec. colligitur diam. ☾.		Altitudo ⊙ supra horizontem.		Momenta inde elicita.	
	dig.	m.	grad.		min.	sec.	gr.	m.	hor.	min.
Initiū.	.	.	.	.	.	.	28.	30.	4.	44
5.	0.	36.	18.	96.	29.	11.	28.	0.	4.	47.
7.	0.	50.	20.	77½.	23.	34.	27.	40.	4.	49.
10.	1.	12.	25.	89.	27.	3.	27.	20.	4.	51.
12.	1.	26.	28.	95½.	29.	2.	27.	0.	4.	52½.
14.	1.	41.	30.	93.	28.	16.	26.	37.	4.	55.
18.	2.	11.	35.	104.	31.	37.	26.	10.	4.	57.
20.	2.	24.	37.	101.	30.	42.	26.	2.	4.	58.
22.	2.	38.	38.	94½.	28.	44.	25.	30.	5.	1.
25.	3.	0.	40.	90½.	27.	31.	25.	24.	5.	1¼.
27.	3.	14.	43.	99.	30.	6.	25.	0.	5.	4.
30.	3.	36.	45.	96½.	29.	20.	24.	40.	5.	5.
33.	3.	58.	47.	95.	28.	52.	24.	25.	5.	7.
36.	4.	19.	50.	99.	30.	6.	24.	5.	5.	9.
38.	4.	34.	51.	97.	29.	29.	23.	40.	5.	11.
39.	4.	41.	52.	98.	29.	48.	23.	30.	5.	12.
39½.	4.	45.	52.	96½.	29.	20.	23.	20.	5.	13.
41½.	5.	0.	54.	99.	30.	6.	23.	0.	5.	15.
42½.	5.	6.	55.	100.	30.	24.	22.	55.	5.	15½.
46½.	5.	35.	57.	97½.	29.	38.	22.	30.	5.	18.
47.	5.	38.	57.	96½.	29.	20.	22.	15.	5.	19.
50.	6.	0.	60.	100.	30.	24.	22.	0.	5.	21.
55.	6.	36.	65.	104½.	31.	46.	21.	2.	5.	26.
60.	7.	12.	67.	101.	30.	42.	20.	30.	5.	29.
61½.	7.	23.	68.	101.	30.	42.	20.	20.	5.	30.
62.	7.	26.	67.	98.	29.	48.	20.	3.	5.	31½.
62,	7.	26.	68.	100½.	30.	33.	19.	45.	5.	33.
64.	7.	41.	68.	98.	29.	48.	19.	30.	5.	34½.
65.	7.	48.	70.	100½.	30	33.	19.	25.	5.	35.
66½.	7.	59.	70.	99.	30.	6.	19.	5.	5.	37.
67.	8.	2.	71.	100.	30.	24.	18.	55.	5.	38.
68.	8.	10.	72.	101.	30.	42.	18.	36.	5.	40.
67½.	8.	6.	70.	98.	29.	48.	18.	0.	5.	43.
68.	8.	10.	70.	98.	29.	48.	17.	16.	5.	47.
68.	8.	10,	70.	98.	29.	48.	16.	40.	5.	51.
67.	8.	2.	69.	97.	29.	29.	.	.	.	.
66.	7.	55.	68.	96½.	29.	20.	16.	0.	5.	54½.
62.	7.	26.	68.	100½.	30.	33.	15.	30.	5.	57½.
59.	7.	5.	66.	100.	30.	24.	15.	0.	6.	0.
58.	6.	58.	65.	90½.	30.	15.	14.	40.	6.	12.
55.	6.	36.	64.	102.	31.	0.	13.	58.	6.	6.
52.	6.	15.	60.	96.	29.	11.	13.	35.	6.	8½.
50.	6.	0.	59.	97.	29.	29.	13.	25.	6.	9½.
48.	5.	46.	58.	98.	29.	48.	13.	5.	6.	11.
46.	5.	31.	57.	99.	30.	6.	12.	48.	6.	13.
39.	4.	41.	54.	107.	30.	32.	.	.	.	.
34.	4.	5.	49.	86.	26.	9.	.	.	.	.

Partes 100. diametri deficientes.	Seu ex reductione in digitos et minuta.		Gradus circumferentiae heinc inde deficientes.	Unde colligitur diam. partium ☾ 100.	Et diam. ⊙ supposita 30. m. 24. sec. colligitur diam. ☾.		Altitudo ⊙ supra horizontem		Momenta inde elicita.	
	dig.	m.	grad.		min.	sec.	gr.	m.	hor.	min.
32½.	3.	54.	48.	102.	31.	0.	11.	18.	6.	22.
31.	3.	43.	47.	103½.	31.	28.	11.	0.	6.	23½.
28.	3.	24.	44.	100.	30.	24.	10.	37.	6.	25½.
27.	3.	14.	43.	99.	30.	6.	10.	27.	6.	27.
25.	3.	0.	40.	90½.	27.	31.	10.	10.	6.	28½.
23.	2.	46.	38.	89.	27.	3.	10.	0.	6.	29½.
20.	2.	24.	37.	101.	30.	42.	8.	45.	6.	31.
19.	2.	17.	35.	98.	29.	48.	.	.	.	.
17.	2.	2.	33.	92.	27.	58.	9.	30.	6.	31½.
12.	1.	26.	28.	95½	29.	2.	9.	0.	6.	35½.

Hactenus tenuiora solum nubila fecerant negotium; ex hoc verò tempore suborta, ac sensim ascendens ab occasu crassissima nubes ita Solem subiit, texitque, ut factus exinde fuerit inconspicuus.

Sequitur Bullialdi observatio, quae est peracta Parisiis, opposito Soli circulo, cujus diameter esset paenè bes pedis Parisiensis. Et diametrum diviserat quidem in parteis 24. circulum in parteis 180. at quod solus Phaseis notaret, altitudines caperet, & singula operaretur, non potuit simul ad diametrorum inclinationes attendere. Quod superest observationem certum ad minutum habendam perscripsit, & hac forma ad me transmisit.

Altitudines ⊙ observate.		Altitudines parall. & Refract. correctae.			Momenta ex altitudinibus correctis.			Digiti Ecliptici.		
gr.	m.	grad.	min.	sec.	hor.	min.	sec.			
32.	35.	32.	35.	59.	4.	21.	4.	.	.	Coepit ☾ stringere marginem ⊙.
31.	30.	31.	30.	50.	4.	27.	39.	1½.		
28.	57.	28.	57.	25.	4.	43.	12.	4.	0.	
27.	56.	27.	56.	21.	4.	49.	24.	5.	0.	
26.	56.	26.	56.	7.	4.	55.	31.	6.	0.	
25.	12.	25.	11.	36.	5.	6.	8.	7½.		
23.	55.	23.	54.	19.	5.	14.	0.	8.	0.	
21.	51.	21.	49.	37.	5.	26.	47.	8¾.		Maximus defectus.
20.	0.	19.	57.	44.	5.	38.	17.	8.	0.	
18.	50.	18.	47.	7.	5.	45.	14.	7.	0.	
18.	8.	18.	4.	35.	5.	50.	3.	6.	0.	
16.	36.	16.	31.	31.	5.	59.	46.	4½.		
16.	2.	15.	57.	17.	6.	3.	37.	4.	0.	
15.	36.	15.	31.	1.	6.	6.	5.	3½.		
15.	8.	15.	0.	52.	6.	9.	16.	3.	0.	
14.	26.	14.	20.	31.	6.	13.	33.	2.	0.	
13.	38.	13.	32.	0.	6.	18.	43.	1.	0.	
12.	41.	12.	34.	49.	6.	24.	49.	0.	0.	Finis; vel potius uno scrupulo citius.

Eclipse of 1652, *April* 7, *observed at Digne.*

1652.—Mense Aprili, die 8. ante meridiem eclipsis ⊙ Diniae novendecim ante annis die quoque Aprilis 8. observâram aliam suo superius loco descriptam. Eadem sum proinde usus machina, eadem observandi ratione; nisi quod & scenam collocandae machinae, & locum proximum captandis Solis altitudinibus in ipsismet Praepositurae aedibus apparaveram. Quod providissem porro fore, ut finis eclipseos sub meridiem contingeret, ac proinde tempus ex parum variatis Solis altitudinibus satis exquisite discerni non posset; idcirco apparâram Sciotericum, quod quas posset suppetias ipsis altitudinibus ferret. Quod vererer autem, ne ingravescente, quae ab aliquot diebus me habebat febricula, adesse observando non possem; ideo commonstrâram non modo Taxili, Toruatori, fidoque Amanuensi Antonio Poteriae, sed insuper etiam juveni praeclaro Francisco Bernerio, quem totis duobus mensibus, cum me invisisset, jam detinebam, quid unicuique praestandum foret, ut meae vices supplerentur. Fuit mihi tamen propitium numen, ut possem non modo interesse, sed regere quoque intra tympanum, circulum eclipseos typum exhibentem, utpote excipientem trajectos telescopio unà cum tumore umbrae lunaris Solis radios, ac adnotare simul formam, quantitatemque ipsius defectus; adjutabat vero adnotanto praeter Tornatorem eximius Joannes Franciscus Augerius Regius cognitor, & rerum bonarum apprime studiosus, qui unà cum optimo Lauteretio fieri particeps spectaculi voluit. Moderabatur interea Bernerius machinam manubrio, Taxilis extra scenam quadratum, Poteria ad quidvis famulabatur. Ne longum autem faciam, rem totam pro more sic uno prospectu ab oculos pono.

Cum tempora heic habeantur ex Solis altitudinibus deducta, taceri non debet Sciotericum exhibuisse initium duobus prope minutis ante, finem duobus, aut tribus post. Et quod ad initium quidem attinet, altitudini magis fido; quod ad finem autem spectat, magis haereo; ac potissimum, quia memini, tametsi perpendiculum visum est constantius haerere ad partem umbrae versae 741. excurrisse tamen interdum versus 740. & ad Sciotericum cum respexi, umbra styli satis praecise ad meridianam lineam quadrabat; quod excessisse enim pilum videbatur, id spectare potuit ad tempus, quo ad quadratum me attentum praebui. Utcumque fuerit ex deducta serie, contigit eclipseos.

Initium hor. 9. min. 43. medium hor. 10. min. 51. finis hor. 11. min. 58.
Sicque fuit tota duratio hor. 2. min. 15. dimidium hor. 1. min. 7½.
Fuere autem maximae obscurationis digit. 9. min. 24.

Diametrorum proportio satis inconstans; veruntamen, ne eam, quae habetur circa initium, ac finem moror, videtur omnibus expensis, & ob Phaseis aliquot, quas commemini diligentius notatas posse rem ita definiri, ut si diameter ⊙ supponatur fuisse min. 30. sec. 4. diameter ☾ fuerit min. 30. sec. 55. sin amplius, aut minus pari proportione. Lubet porro apponere schema, juxta quod proportionem deduxi.

Cum subinde observationem, calculumque eclipseos communicassem cum optimò Valesio, rescribens ipse die 27. Gratianopoli perscripsit treis observationes duas Parisiis seorsim peractas, alteram a nostro Bullialdo, alteram a meo quondam Agarrato, ac Morino; tertiam Avenione a nobili, communique nostro San-Legerio. Parisiensis sic fuerunt

Bullialdo.	Agarrato & Morino.	Utrique.
Initium hor. 9. min. 12. sec. 47.	hor. 9. min. 30.	
Medium hor. 10. min. 25. sec 19.	hor. 10. min. 45.	Digiti ecliptici 10. min. 20.
Finis hor. 11. min. 42. sec. 14.	hor. 12. min. 12.	

Avenionensis autem sic		De quantitate eclipseos nihil perscripsit.
	Initium hor. 9. min. 33.	
	Medium hor. 10. min. 50.	
	Finis hor. 11. min. 53.	

Eclipse of 1652, *April* 7, *observed by* GASSENDUS *at Digne.*

Phases defectus	Altitudo ☉			Tempora inde elicita		Semiarcus deficientis orae ☉	Oualium diamet. ☉ 720 taliū elicitur semidiamet. ☾	Heinc diam. ☉ supposita 30 min. 40 sec. deducitur semidiam. ☾		Ac proinde ipsa semidiameter ☾	
Digiti	Umbra recta	grad.	min.	hor.	min.	grad.		min.	sec.	min.	sec.
Initiu	92500	42	46	9	43	.	.	.	.	.	.
0½	939	43	12	9	46	16	628	26	45	13	22
1.	955	43	40	9	49	24	764	32	32	16	16
1½	962	43	54	9	51	29	724	30	50	15	25
2.	977	44	20	9	54	34	748	31	50	15	55
2½	991	44	44	9	57	38	740	31	31	15	45
.	V. V.	.	.	.	.	.	.	.	.	.	.
3.	999	45	2	10	0	42	751	32	0	16	0
3½	991	45	16	10	2	45	719	30	38	15	19
4.	977	45	40	10	5	48	698	29	44	14	52
4½	965	46	1	10	8	52	743	31	39	15	50
5.	948	46	31	10	12	55	742	31	36	15	48
5½	935	46	54	10	15	58	739	31	29	15	45
6.	924	47	14	10	18	60½	730	31	6	15	33
6½	915	47	32	10	21	64	746	31	46	15	53
7.	900	48	0	10	25	67	740	31	31	15	45
7½	891	48	17	10	28	70	749	15	44	15	57
8.	878	48	43	10	32	73	751	32	0	16	0
8½	865	49	9	10	37	76	750	31	56	15	57
9.	849	49	39	10	42	79	748	31	51	15	55
$9\frac{2}{10}$	838	50	3	10	45	80	749	31	54	15	57
$9\frac{3}{10}$	828	50	13	10	48	81	753	32	5	16	2½
$9\frac{4}{10}$	824	50	30	10	50	82	753	32	5	16	2
$9\frac{4}{10}$	822	50	34	10	51	82	753	32	5	16	2
$9\frac{4}{10}$	820	50	38	10	52	83	762	32	27	16	14
$9\frac{3}{10}$	818	50	43	10	53	82	753	32	5	16	2
$9\frac{1}{10}$	814	50	52	10	55	81	765	32	35	15	18
9.	809	51	1	10	58	80	762	32	27	16	14
8½	799	51	22	11	3	75	741	31	34	15	47
8.	787	51	47	11	8	73	751	32	0	16	0
7½	781	52	1	11	12	69	734	31	16	15	38
7.	776	52	12	11	16	65½	723	30	47	15	24
6½	770	52	22	11	19	63	726	30	55	15	27
6.	765	52	35	11	23	60	720	30	40	15	20
5½	762	52	42	11	26	58	739	31	29	15	45
5.	757	52	53	11	30	55	742	31	36	15	48
4½	754	52	59	11	33	53	775	33	1	16	30
4.	752	53	4	11	36	49	753	33	5	16	2½
3½	749	53	10	11	39	46	771	33	51	16	25
3.	747	53	14	11	42	42	751	32	0	16	0
2½	741	53	18	11	44	38	740	31	31	15	45
2.	744	53	21	11	47	34	748	31	51	15	55
1½	743	53	23	11	49	28	743	27	24	13	42
1.	742	53	24½	11	52	23	672	28	20	14	20
0½	742	53	26	11	55	16	628	26	45	13	22
Finis.	741	53	27	11	58	.	.	.	.	.	.

Observatio deliquii Solaris die 12. *Augusti* 1654. *Aquis-Sextiis facta ab Honorato Galterio.*

Obscuratio Solis								Recuperatio luminis							
	Altitudo ☉		V.		Tempora				Altitudo ☉		V.		Tempora.		
Digiti	gr.	min.	gr.	min.	hor.	min.	sec.	Digiti.	gr.	min.	gr.	min.	hor.	min.	sec.
Initiū.	35.	30.	54.	57.	3.	39.	12.	7.	49.	7.	34.	27.	2.	18.	.
1.	36.	15.	53.	39.	3.	34.	9.	.	50.	20.	32.	25.	2.	9.	10.
½.	.	.	.	.	.	.	.	6.	51.	10.	30.	58.	2.	4.	.
2.	.	.	.	.	.	.	.	.	52.	2.	29.	15.	1.	57.	.
½.	.	.	.	.	.	.	.	5.	52.	26.	27.	27.	1.	49.	6.
3.	38.	35.	50.	32.	3.	22.	2.	.	53.	12.	27.	21.	1.	49.	2.
½.	39.	45.	48.	50.	3.	15.	5.	4.	53.	50.	26.	8.	1.	44.	.
4.	41.	10.	46.	46.	3.	7.	.	.	54.	21.	25.	9.	1.	40.	.
½.	.	.	.	.	.	.	.	3.	54.	55.	24.	1.	1.	36.	1.
5.	41.	35.	46.	8.	3.	4	8.	.	55.	20.	23.	9.	1.	32.	9.
½.	42.	35.	44.	40.	2.	58.	10.	2.	55.	33.	22.	42.	1.	30.	12.
6.	43.	6.	43.	53.	2.	55.	8.	.	55.	58.	21.	50.	1.	27.	5.
½.	.	.	.	.	.	.	.	1.	56.	18.	21.	14.	1.	25.	.
7.	45.	35.	40.	6.	2.	40.	6.	.	57.	.	19.	31.	1.	18.	.
½.	47.	14.	37.	30.	2.	30.	.	Finis.	57.	20.	18.	45.	1.	15.	.
8.	48.	10.	36.	1.	2.	24.	1.	.	.	.	.	.	.	.	.

Initium hor. 8. min. 20. medium hor. 9. min. 36. finis hor. 10. min. 45. tota duratio hor. 2. min. 25.

§ 9.

OBSERVATIONS OF HEVELIUS.

The observations of Hevelius are found in the *Machina Coelestis*, pars posterior. Owing to the rarity of this work, the observations I have used are given pretty fully. The position of Hevelius's observatory, from data kindly communicated by Dr. Kayser, was

Latitude, $54^{\circ}\ 21'\ 19''$; $\log \rho \sin \varphi' = 9.90795$.
Longitude, $1^{h}\ 14^{m}\ 36^{s}$ east of Greenwich; $\log \rho \cos \varphi' = 9.76644$.

Eclipsis Solis, 1639. *June* 1.

The times are from a sun-dial ("ex Sciaterico"), which must have been wholly unreliable. I therefore make no use of the observations.*

Page 7.—Observatio Eclipseos Palilicii. Anno 1644, die 15, Novemb. manè instituta Gedani Initium Occultationis Palilicii accidebat secundum horologium correctum (altitudines enim tum temporis observandi non dabatur occasio) hora 3. matut. 5′. Occultabatur à Lunâ circa 96. grad. limbi, nempe orientalis, ad Montem Alabastrinum Maris Eoi; quo tempore gradus Lunæ 75. limbi. verticalis existebat. Emergebat hor. 4. 5′. 30″. circa gradum 317. limbi occidentalis, Montemq; Alaunum, paululùm supra Paludem Maeotidem; quo temporis articulo gradus limbi Lunæ 78. erat verticalis. Hora 4. 10′ 30″ post emersionem, Palilicium tanto spatio à limbo removebatur, quanto scilicet lata erat Palus Maeotis, parte nimirùm duodecimâ circiter diametri Lunaris.

As the altitudes from which these times are derived are not given, we have to add the uncertainty of the elements of reduction used by Hevelius to that of his observations; I have therefore hesitated whether to use the observation, but concluded to do so owing to its early epoch. The equation of time was $-14^{m}\ 51^{s}$, we have, therefore, for the mean times:—

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* This remark was made at the time of first examining the observations. Afterward, having come into possession of a copy of the original work, I concluded to reduce them, more as an experiment than with the hope of reaching any result of value, and the results are given in a subsequent section.

	Immersion.	Emersion.
Apparent times given by HEVELIUS	$15^{h}\ 5^{m}\ 0^{s}$	$16^{h}\ 5^{m}\ 30^{s}$
Mean times thence deduced	$14^{h}\ 50^{m}\ 9^{s}$	$15^{h}\ 50^{m}\ 39^{s}$
Greenwich mean times	$13^{h}\ 35^{m}\ 33^{s}$	$14^{h}\ 36^{m}\ 3^{s}$.

Eclipsis Solis. Anno Aerae Christianae 1645, *die* 21. *Augusti st. n. Gedani observata.*

Crescentis Obscurationis.					Decrescentis Obscurationis.			
Phases.	Secundū accuratū Sciatericū lineae Meridianae applicatum. h. m. s.	Altit. Solis Quad. Orichalc. ° ′ ″	Tempus ex altitudinibus correctum. h. m. s.		Phases.			
Initium.	11. 23. 45.	. . .	. . .	. .	7½. Dig.	12. 45. 30.	. . .	. . .
½. Dig.	11. 27. 0.	. . .	. . .	. .	7¼.	12. 50. 40.	. . .	. . .
.	11. 31. 30.	47. 15. 0.	11. 31. 6.	. .	7.	12. 54. 45.	. . .	. . .
1½. Dig.	11. 33. 30.	. . .	. . .	. .	6½.	1. 1. 50.	. . .	. . .
2.	11. 38. 0.	. . .	. . .	. .	6.	1. 6. 0.	45. 40. 0.	1. 6. 8.
2½.	11. 42. 30.	. . .	. . .	. .	5¾.	1. 8. 30.	. . .	. . .
3⅛.	11. 45. 30.	. . .	. . .	. .	5¼.	1. 12. 20.	. . .	. . .
4¼.	11. 56. 0.	. . .	. . .	. .	5.	1. 15. 30.	45. 5. 0.	1. 15. 36.
5.	12. 1. 30.	. . .	. . .	. .	4½.	1. 20. 0.	. . .	. . .
5½.	12. 7. 30.	. . .	. . .	. .	4.	1. 23. 45.	44. 20. 0.	1. 24. 25.
6.	12. 11. 30.	. . .	. . .	. .	3.	1. 31. 30.	. . .	. . .
6½.	12. 16. 30.	. . .	. . .	. .	¾.	1. 47. 30.	. . .	. . .
6⅞.	12. 21. 0.	. . .	. . .	. .	½.	1. 49. 0.	. . .	. . .
7.	12. 22. 0.	. . .	. . .	. .	Finis.	1. 53. 0.	. . .	. . .
7⅛.	12. 25. 0.	. . .	. . .	. .	.	1. 56. 0.	41. 55. 0.	1. 55. 50.
7¼.	12. 27. 0.	. . .	. . .	. .	.	2. 26. 0.	38. 46. 0.	2. 26. 40.
7⅜.	12. 30. 0.	. . .	. . .	. .	.	2. 30. 0.	38. 24. 0.	2. 30. 0.
7¼.	12. 31. 0.	. . .	. . .	. .	.	. . .	. . .	. . .
.	12. 36. 30.	47. 0. 0.	12. 37. 13.	. .	.	. . .	. . .	. . .
7¾.	12. 41. 20.	46. 50. 0.	12. 41. 52.	. .	.	. . .	. . .	. . .

The sun's declination at noon being $+11^{\circ}\ 59'.0$, the hour-angles given in the last column seem very nearly correct. The general agreement of the sun-dial with the times deduced from the altitudes affords a strong presumption in favor of the accuracy of both.

The following are the corrections to reduce the sun-dial to mean time, as deduced from the nine individual altitudes:—

$+1^{m}\ 50^{s}$
$3^{m}\ 30^{s}$
$3^{m}\ 19^{s}$
$3^{m}\ 12^{s}$
$2^{m}\ 53^{s}$
$5^{m}\ 18^{s}$(?)
$2^{m}\ 5^{s}$
$3^{m}\ 21^{s}$
$2^{m}\ 48^{s}$.

In the case of the sixth altitude, there is a discrepancy of two minutes between the times given by HEVELIUS and that deducible from the altitude, which would seem to arise from an error in printing the altitude. This is therefore rejected.

The mean of the eight remaining results is + $2^m\ 52^s$, which is the constant applied hereafter to reduce the dial to mean time. The equation of time being $2^m\ 31^s$, the apparent error of the dial is 21^s.

Judging from the discordances, the probable errors of the observed times do not exceed 15^s or 20^s.

Page 8.—Occultatio Palilicii Anno 1645, die 8. Octob. st. n. Lunâ existente gibbâ. Gedani animadversa. Quum Luna Palilicii appropinquaret ad distantiam 15′, ante scilicet conjunctionem, Jovis altitudo Quadrante ex Orichalco confecto, accuratè deprehensa est in plaga Orient, 36° 25′ ∴ $1^h.\ 27^m$.

Principium obscurati Palilicii incidebat in altitudinê Jovis, 38° 48′ ∴ $1^h.\ 43^m$.

Emergente rursùs Palilico ex umbrâ Lunæ, altitudo humeri lucidi Orionis, in plagâ Orient inveniebatur, 38° 45′ ∴ $2^h.\ 57^m$.

The position of Jupiter for the time of immersion has been derived from BOUVARD's tables, with the result:—

Geocentric right ascension	$6^h\ 24^m\ 34^s$
Geocentric declination	$+23°\ 4'.0$.

Hence, from the second altitude, we have, for the local mean time of the immersion, $13^h\ 33^m\ 6^s$. The equation of time is $-12^m\ 25^s$, so that there is a difference of more than two minutes between this reduction and that of HEVELIUS. The discrepancy is the same in the time derived from the first altitude, so that the difference can arise only from the difference of the adopted positions of Jupiter, or other data of reduction.

The altitude of α Orionis gives for local mean time $14^h\ 43^m\ 20^s$, about a minute earlier than that of HEVELIUS. The results of the recomputation of times are:—

Greenwich mean time of immersion . . .	1645, Oct. 7, $12^h\ 18^m\ 30^s$.
Greenwich mean time of emersion . . .	1645, Oct. 7, $13^h\ 28^m\ 44^s$.

Observatio Eclipseos Solaris, Gedani, Anno aerae Christianae 1652, *die* 8 *Aprilis st. n. peracta.*

Ordo Phas. Crescēt.	Phasium Digiti Ecliptici.	Vibrationes perpendiculi.	Verum atq. genuinum tem. ex vibrationibus perp. deductum.	Tempus secundùm exquisitû sciatericum horizontale.	Tempora secūdùm horologium ambulatorium.	Altitudinès Cêtri Solaris.	Accuratum Tempus ex alt. ⊙ erutum.
					h. m. s.	gr. m.	
.	.	1.	. . .	. . .	10. 0. 0.	. .	. . .
.	.	253.	10. 3. 51.	. . .	10. 6. 0.	. .	. . .
.	.	379.	10. 6. 46.	. . .	10. 9. 0.	. .	. . .
.	.	507.	10. 9. 44.	. . .	10. 12. 0.	. .	. . .
.	.	635.	10. 12. 41.	. . .	10. 15. 0.	. .	. . .
.	.	853.	10. 17. 47.	. . .	10. 20. 0.	. .	. . .
.	.	1281.	10. 27. 41.	. . .	10. 30. 0.	. .	. . .
.	.	1985.	10. 43. 55.	. . .	10. 46. 0.	. .	. . .
.	.	2155.	10. 47. 51.	. . .	10. 50. 0.	. .	. . .
.	.	2320.	10. 51. 40.	. . .	10. 54. 0.	. .	. . .
.	.	2484.	10. 55. 25.	. . .	10. 58. 0.	. .	. . .
.	.	2565.	10. 57. 20.	10. 57. 30.	11. 0. 0.	. .	. . .
.	.	2598.	10. 58. 8.	10. 58. 0.	11. 0. 45.	. .	. . .
.	Nihil adh.	2681.	11. 0. 0.	11. 0. 0.	. . .	. .	. . .
.	Initium.	2826.	11. 3. 21.	11. 3. 30.	11. 6. 12.	. .	. . .
1.	$2\frac{1}{5}$.dig.	3308.	11. 14. 30.	11. 14. 30.	11. 17. 20.	. .	. . .
2.	$2\frac{5}{8}$.	3392.	11. 16. 26.	11. 16. 30.	11. 19. 20.	. .	. . .
3.	$2\frac{3}{4}$.	3503.	11. 19. 0.	11. 19. 0.	11. 21. 18.	. .	. . .
4.	3.	3574.	11. 20. 39.	11. 21. 0.	11. 23. 58.	. .	. . .
5.	$3\frac{1}{4}$.ferè.	3657.	11. 22. 34.	11. 23. 0.	11. 25. 53.	. .	. . .
6.	$3\frac{1}{2}$.& paulò plus.	3750.	11. 24. 43.	11. 25. 0.	11. 28. 26.	. .	. . .
7.	4.	3838.	11. 26. 45.	11. 27. 0.	11. 30. 29.	. .	. . .
8.	$4\frac{2}{5}$.	3954.	11. 29. 26.	11. 30. 0.	11. 32. 25.	. .	. . .
9.	5.	4120.	11. 33. 17.	11. 33. 0.	11. 36. 10.	. .	. . .
10.	$5\frac{3}{8}$.	4214.	11. 35. 27.	11. 35. 30.	11. 39. 20.	. .	. . .
11.	$5\frac{3}{4}$.	4270.	11. 36. 45.	11. 37. 0.	11. 40. 0.	. .	. . .
12.	$6\frac{2}{3}$.	4588.	11. 44. 6.	11. 44. 0.	11. 47. 7.	. .	. . .
13.	7.	4690.	11. 46. 28.	11. 46. 30.	11. 49. 39.	. .	. . .
14.	$8\frac{5}{8}$.	5464.	12. 4. 19.	12. 4. 30.	12. 7. 58.	. .	. . .
15.	9.& paulò plus.	5590.	12. 7. 14.	12. 7. 0.	12. 10. 1.	. .	. . .
16.	$9\frac{3}{8}$.	5735.	12. 10. 35.	12. 0. 30.	12. 13. 20.	. .	. . .
			PHASES DECRESCENTES.				
17.	$9\frac{1}{3}$.Dig.	5816.	12. 12. 27.	12. 12. 0.	12. 15. 0.	. .	. . .
18.	$8\frac{1}{4}$.	6392.	12. 25. 47.	12. 26. 0.	12. 29. 0.	. .	. . .
19.	$7\frac{7}{8}$.	6488.	12. 28. 0.	12. 28. 30.	12. 31. 21.	. .	. . .
20.	$6\frac{2}{3}$.	6883.	12. 37. 8.	12. 37. 0.	12. 40. 0.	. .	. . .
21.	$6\frac{1}{4}$.	7103.	12. 40. 18.	12. 40. 0.	12. 43. 22.	. .	. . .
22.	$4\frac{3}{4}$.	7402.	12. 49. 8.	12. 49. 0.	12. 53. 0.	. .	. . .
.	$4\frac{1}{4}$.	7494.	12. 51. 6.	12. 51. 0.	12. 54. 31.	. .	. . .
23.	$4\frac{1}{5}$.	7558.	12. 52. 45.	12. 52. 30.	12. 56. 11.	. .	. . .
24.	1.circ.	8444.	1. 13. 15.	1. 12. 30.	1. 16. 40.	. .	. . .
25.	$\frac{3}{4}$.	8514.	1. 14. 51.	1. 15. 0.	1. 19. 21.	. .	. . .
26.	$\frac{3}{8}$.	8575.	1. 16. 17.	1. 16. 30.	1. 20. 45.	. .	. . .
.	Finis.	8694.	1. 19. 2.	1. 19. 0.	1. 23. 0.	. .	. . .

Observatio Eclipseos Solaris, Gedani, Anno aerae Christianae 1652, *die* 8 *Aprilis st. n. peracta*—Continued.

Ordo Phas. Crescēt.	Phasium Digiti Ecliptici.	Vibrationes perpendiculi.	Verum atq. genuinum tem. ex vibrationibus perp. deductum.	Tempus secundùm exquisitū sciatericum horizontale.	Tempora secūdùm horologium ambulatorium.	Altitudinès Cêtri Solaris.	Accuratum Tempus ex alt. ☉ erutum.
					h. m. s.	gr. m.	
.	.	9096.	1. 28. 19.	1. 29. 0.	1. 33. 0.	39. 50.	1. 29. 22.
.	.	9244.	1. 31. 45.	1. 32. 0.	1. 36. 5.	39. 32.	1. 33. 29.
.	.	9454.	1. 36. 36.	1. 37. 0.	1. 41. 0.	39. 10.	1. 38. 19.
.	.	10664.	2. 4. 35.	2. 5. 0.	2. 8. 47.	. .	. . .
.	.	. .	. . .	2. 19. 30.	2. 23. 20.	. .	. . .
.	.	. .	. . .	2. 21. 0.	2. 24. 52.	. .	. . .
.	.	. .	. . .	. . .	2. 25. 47.	35. 13.	2. 22 5.
.	.	11461.	2. 23. 0.	2. 23. 0.	2. 27. 0.	35. 3.	2. 23. 39.
.	.	. .	. . .	2. 24. 0.	2. 28. 0.	. .	. . .
.	.	. .	. . .	. . .	2. 29. 0.	34. 44.	2. 25. 14.
.	.	. .	. . .	2. 29. 0.	. . .	34. 37.	2. 28. 10.
.	.	. .	. . .	. . .	2. 32. 30.	34. 27.	2. 29. 16.
.	.	. .	. . .	2. 33. 0.	. . .	34. 9.	2. 32. 0.
.	.	. .	. . .	2. 36. 0.	. . .	33. 50.	2. 35. 0.
.	.	. .	. . .	. . .	4. 48. 15.	17. 4.	4. 45. 9.
.	.	. .	. . .	. . .	4. 50. 15.	16. 50.	4. 46. 51.
.	.	. .	. . .	4. 49. 0.	4. 53. 0.	. .	. . .
.	.	. .	. . .	4. 57. 0.	5. 1. 0.	. .	. . .
.	.	. .	. . .	5. 3. 0.	5. 6. 45.	14. 30.	5. 3. 4.
.	.	. .	. . .	5. 6. 0.	5. 10. 20.	. .	. . .

Animadvertenda.

Cum coelum, ab ipso diluculo matutino, nubibus undiqùe ita esset obductum, ut horologium artificiale, tam singula minuta secunda, quam dena tertia accuratè commonstrans, neque ad altitudines Solares, neque ad Sciatericum dingi atq́; corrigi posse, ulla spes superesset; consultum esse duximus, hora statim 10, tum majoris evidentiae gratiâ, tum ut eò certuis constaret, quot earum horam adimplerent integram, perpendiculi annotare vibrationes. Animadversum autem sic fuit, tam ex Sciaterico nostro singula minuta indicante, atque ad lineam meridianam fideliter applicato, quam ex altitudinibus Solaribus, 2595 oscillationes conficere horam integram, & 43¼ minutum primum; tot planè scilicet, quot ante biennium, circa Eclipsin Solarem, in simili temporis intervallo ejusdem perpendiculi ope deprehendimus.

Instante igitur initio Eclipseos, praeter ferè omnem spem, Sol adspectu suo nos exhilaravit admodum; sic ut horâ 11 secundùm Horologium ambulatorium, & Sciatericum, & Vibrationes perpendiculi, exquisitè simul conjugere octatq́; conferre facultas daretur, Sole interim tum temporis prorsùs existente puro, & à Lunâ illaeso. Post initium verò quod accuratissimè annotatum, Sol iterum sub nubibus aliquantulùm delituit; quamquam postmodum per intervalla satis temporis nobis consessum fuerit multas diversissimasq́; (attestante observationis inconismo) & quidem beneficio limitatioris Telescopii, in camerâ obscuratâ, per Machinam, in Selenographia nostrâ p. 98 descriptam, ritè & fideliter annotare.

Quod autem in ipso Eclipseos principio altitudines Solares non fuerint à nobis capta, causa hoc est: quod in tali Solis circa meridiem situ, parum iis admodum sit fidendum. Quocirca altitudines circa exordium rejecimus, usque dum Sol à meridiano moveretur longius; atque tum demum aliquot fuerunt notatae, ad majorem scilicet observationis fidem. Quae omnes, ut cum sciaterico & perpendiculi reciprocationibus quàm optimè conveniunt; sic simul cum sciaterico & oscillationibus indicant, in quantùm horologium nostrū mechanicum, tam circa initium, quam finem, à vero aberraverit tempore; ob quam tamen deviationem horologium istud non est planè contemnendum Inde namque verum atque exactum tempus, aeque ut ex sciaterico & altitudinibus, excessu tantum, vel defectu probè attento, elicitur: imo denegatis interdum, ob coelū subnubilum, altitudinibus, & interruptâ adulteratâq; Solis in sciaterico umbrâ, ejusmodi automata in observationibus coelestibus summoperè sunt necessaria.

Caeterum nolui omninò circa phases delinendas, (ut ut plerumque istud fieri solet) non tantum integros eligere digitos. semidigitosque; sed quascunq; designavi, quae se se commode offerebant, & quas tutò, & exquisitè acquirere me posse praevidebam, spretis reliquis omnibus. Quippe ob leve etiam impedimentum, & ob motum Solis velocissimum, haec vel illa phasis, licet maxime eam attendamus, facilè nonnunquam praeterlabitur.

Adhaec phases ipsas, in adjecta figurâ I. aliter planè, quam in Observatione Anno 1649 habitâ, nimirum cum ipsis inclinationibus, uti in Tabellâ cameraque obscuratâ sunt observatae, omnes tamen sub uno eodemque perpendiculo, depinximus.

Proinde constat, Solem circa initium in 77 gradu à puncto Nadir, Africam versùs, hora scilicet 11.3′.21″ fuisse obscuratum; atque circa 25 circiter gradum à puncto Zenith, Aquilonem versùs, hora videlicet 1.19′.0″ desiisse obscurari. Medium verò, sive maxima obscuratio hujus deliquii, incidit circa phasin nostram 16, hora scilicet 12.10′ 35″, id quod pariter ex diversissimus faciebus inter se collatis satis certè patet. Vera itaque ejus magnitudo 9⅜ digitorum, sive 9 digit. & 23′ hic Dantisci exstitit. Ratio autem semidiametrorum Solis & Lunae inventa fuit hâc vice, ut 1000 ad 1033 circit.

Quomodo praetereà in Eclipseos progressu phasium cornua se se praebuerint conspicienda, & quem limbi gradum in omni positu tetigerint, ipsum Schema deliquii cuique haud currente oculo id perlustraturo, sufficienter ostendet. Quò verò adhuc clariùs hanc Eclipsin ponerem ob oculos, operae duxi precium, praecipuas etiam phases, tam crescentes, quàm decrescentes, cum earum inclinationibus, ex majore Schemate deductas, & ad integros digitos proportionatas, in forma representare minori; id quod nemini forsitam accidet ingratum.

No altitudes having been observed until the eclipse was entirely over, there is necessarily some little doubt respecting the correction to the pendulum and the sun-

dial. Recomputing some of the altitudes, I find hour-angles averaging 25^s greater than those of HEVELIUS. The corrections to the dial derived from the first altitudes are decidedly positive, while the later ones do not indicate any correction. The general result agrees with the observations of 1645 in indicating a positive correction to the apparent time of the sun-dial, a correction which we may estimate at $+25^s \pm 10^s$. The equation of time being $+1^m\ 37^s$, the entire correction to reduce to local mean time will be $+2^m\ 2^s$. This correction is to be applied to the mean of the results, "ex vibrationibus perpendiculi", and "secundum sciatericum".

Page 35.—*Eclipse of* 1654, *August* 12*th.*

The times do not seem entirely reliable unless they are founded on more data than are given. The clock seems to have been corrected by a single altitude of the sun. The following are all the results it seems worth while to use. The second column is headed "Horolog. artificiale ex altit. perpêd. correctum"; the third, "Vibrationes perpendiculi":—

	H.	M.	S.		
.	8.	0.	0.	0.	
.	8.	19.	3.	743.	
.	9.	0.	0.	2340.	
Initium.	9.	25.	15.	3322.	
¼. Dig.	9.	26.	30.	3371.	
1. Dig.	9.	31.	0.	3548.	
2½. & paulò plus.	9.	41.	40.	3964.	
3. ferè.	9.	42.	58.	4015.	
3½. ferè.	9.	46.	45.	4162.	⊙ cent. alt. = $42°.\ 53'.\ 0''.$; $t = 9^h.\ 47^m.\ 8^s.$
.	9.	47.	8.	4178.	⊙ azimuth = $46°.\ 18'.$; $t = 9^h.\ 47^m.\ 3^s.$
3¾.	9.	48.	22.	4227.	
4.	9.	49.	0.	4289.	

The times in the second column are deduced from the "vibrationes perpendiculi" in the last by assuming 39 vib. = 1 min., and correcting the count by the altitude. But in the last there is an error either of one minute or of forty vibrations: it is hard to tell which. I deduce the apparent time, $9^h\ 46^m\ 55^s$, from the altitude, 13^s less than that of HEVELIUS.

Page 45.—*Observatio Eclipseos Solaris. Gedani. Anno 1656, die 26 Januar. habita.*

Quantitas Phasium observat.	Oscillationes perpendiculi.	Tempus ex Oscillationibus erutum.	Altitudines Centri Solaris Quad. Azimut. captae.	Azimutha ⊙ occident.	Tempus ex Altitudinibus ⊙ supputatum.	Tempus ex Azimuthis deductum.	Tempus secundū horologium ambulatorium.
			° ′ ″	° ′	h. m. s.	h. m. s.	h. m. s.
.	.	. . .	16. 57. 15.	0. 0.	12. 0. 0.	12. 0. 0.	12. 0. 0.
.	.	. . .	15. 27. 15.	16. 56.	1. 10. 12.	1. 9. 0.	1. 9. 10.
.	0.	1. 30. 0.	. . .	. .	. . .	. . .	1. 30. 0.
.	587.	1. 44. 55.	. . .	. .	. . .	. . .	1. 45. 0.
Initium.	827.	1. 51. 2.	. . .	. .	. . .	. . .	1. 51. 12.
$\frac{7}{12}$. dig.	1000.	1. 55. 25.	. . .	. .	. . .	. . .	1. 55. 35.
$\frac{11}{12}$.	1096.	1. 57. 22.	. . .	. .	. . .	. . .	1. 57. 32.
1.	1170.	1. 59. 50.	. . .	. .	. . .	. . .	2. 0. 0.
$1\frac{1}{4}$. ferè.	1282.	2. 2. 33.	. . .	. .	. . .	. . .	2. 2. 49.
$1\frac{3}{4}$. ferè.	1495.	2. 8. 0.	. . .	. .	. . .	. . .	2. 7. 45.
.	1639.	2. 11. 40.	11. 46. 0.	31. 34.	2. 12. 0.	2. 11. 22.	2. 11. 29.
$2\frac{3}{4}$.	1745.	2. 14. 22.	11. 33. 0.	32. 17.	2. 14. 42.	2. 14. 0.	2. 14. 18.
Paulò plus.	1811.	2. 16. 3.	. . .	. .	. . .	. . .	2. 15. 54.
3. dig.	1860.	2. 17. 17.	. . .	. .	. . .	. . .	2. 16. 56.
.	1961.	2. 19. 51.	11. 8. 0.	33. 33.	2. 19. 48.	2. 19. 45.	2. 19. 46.
$3\frac{1}{2}$.	2029.	2. 21. 35.	. . .	. .	. . .	. . .	2. 21. 29.
$3\frac{3}{4}$.	2110.	2. 23. 49.	. . .	. .	. . .	. . .	2. 23. 32.
4.	2213.	2. 26. 16.	10. 37. 30.	35. 0.	2. 26. 21.	2. 26. 10.	2. 26. 15.
$4\frac{1}{8}$.	2302.	2. 28. 31.	. . .	. .	. . .	. . .	2. 28. 34.
.	2400.	2. 31. 1.	10. 13. 0.	36. 7.	2. 31. 7.	2. 31. 8.	2. 31. 5.
$4\frac{1}{2}$. & paulò ampl.	2478.	2. 33. 0.	10. 4. 0.	36. 28.	2. 32. 50.	2. 32. 42.	2. 32. 58.
5.	2589.	2. 35. 49.	. . .	. .	. . .	. . .	2. 35. 59.
.	2595.	2. 36. 0.	9. 48. 0.	37. 12.	2. 35. 54.	2. 35. 58.	2. 36. 3.
$5\frac{1}{8}$.	2676.	2. 38. 2.	9. 36. 0.	37. 36.	2. 38. 10.	2. 37. 47.	2. 38. 5.
$5\frac{3}{8}$.	2766.	2. 40. 20.	. . .	. .	. . .	. . .	2. 40. 24.
.	2814.	2. 41. 33.	9. 20. 0.	38. 24.	2. 41. 15.	2. 41. 21.	2. 41. 38.
$5\frac{5}{8}$.	2820.	2. 41. 42.	. . .	. .	. . .	. . .	2. 41. 49.
.	2898.	2. 43. 40.	9. 7. 30.	38. 54.	2. 43. 32.	2. 43. 37.	2. 43. 50.
6.	3004.	2. 46. 22.	8. 52. 30.	39. 31.	2. 46. 14.	2. 46. 24.	2. 46. 35.
$6\frac{3}{8}$.	3325.	2. 54. 33.	8. 8. 0.	41. 18.	2. 54. 19.	2. 54. 32.	2. 54. 58.
$6\frac{5}{8}$.	3469.	2. 58. 7.	7. 47. 30.	42. 6.	2. 57. 53.	2. 58. 11.	2. 58. 38.
$6\frac{7}{8}$.	3598.	3. 1. 28.	7. 28. 0.	42. 39.	3. 0. 25.	3. 0. 45.	3. 1. 53.
7. frerè.	3711.	3. 4. 21.	7. 12. 0.	43. 23.	3. 4. 6.	3. 4. 6.	3. 4. 41.
.	3913.	3. 9. 29.	6. 42. 0.	44. 30.	3. 9. 5.	3. 9. 16.	3. 9. 51.
7. & paulò minus.	4055.	3. 13. 6.	6. 18. 0.	45. 18.	3. 13. 1.	3. 13. 1.	3. 13. 40.
$6\frac{11}{12}$.	4077.	3. 13. 30.	. . .	. .	. . .	. . .	3. 14. 12.
$6\frac{7}{8}$.	4578.	3. 16. 23.	5. 59. 0.	46. 0.	3. 16. 6.	3. 16. 17.	3. 16. 46.
$6\frac{3}{4}$.	4734.	3. 20. 21.	5. 33. 0.	46. 49.	3. 20. 16.	3. 20. 8.	3. 20. 43.
.	5136.	3. 30. 35.	. . .	. .	. . .	. . .	3. 31. 0.

HEVELIUS states that his pendulum made 2360 vibrations in an hour. The equation of time is $+13^{\mathrm{m}}\ 20^{\mathrm{s}}$, and this has been taken as the correction applicable to the times in the third column. But, as scarcely more than half the eclipse was observed, there is no way of eliminating the systematic errors of observation. The observations are therefore of no great value.

Page 49 —*Occultatio Stellulae in Ariete.*

Anno 1656, die, ☿, 1 Martii vesperi, duas Stellulas, sed globo hactenus nondum adscriptas à Luna plusquàm Lunatâ tectas observavi; prior *a* supra eductionem caudae Arietis sita est, ad 17′ vel 18′ Boream versùs; *s* in longitudine vero ad 11′ promotior est, quàm dicta Stella cognita. Tegebatur autem à Lunâ, alto Palilicio 38° 13′ 30″.

The mean time deducible from this altitude is	$8^h\ 34^m\ 45^s$
Greenwich time	$7^h\ 20^m\ 9^s$.

Page 89.—*Observatio Occultationis Binarum Stellularum in* ♉ 1658 *Oct.* 14. *vesperi.*

Stella una fuit sequens duarum Australior in Collo ♉, cujus longitudo 1° 18′ ♊. Latitudo B. 0° 46′. Stella altera non habetur in Catalogo aut globis: Erat autem paulo Orientalior priore & Borealior, quam rursus sequebantur duae aliae Stellae, tanto intervallo, ut omnes simul Tubo caperentur.

Tempus juxta. Horolog. majus.	Alt. Capella.	Tempus ex Altitud.	
9. 23. 46.	34. 45.	9. 25. 48.	
9. 37. 10.	36. 25.	9. 39. 4.	Hinc propter intervenientes nubes & pluvias Luna & Ingressus Stellae sub Lunam videri non potuit.
10. 8. 0.	. .	. . .	Stella incognita paulò minus distabat à Luna diametro Lunari: & paulò plus quā duae Stellulae eandem sequentes à se invicē.
11. 5. 15.	49. 28.	11. 16. 28.	
11. 20. 0.	. .	11. 21. 15.	Ingressa videbatur Stella discum Lunarem supra Montē Alabastr.
. . .	. .	. . .	Stella incognita non amplius conspicua, videbatur subiisse discum Lunarem.

The following are the mean times actually resulting from the three altitudes of Capella, together with the corrections to the apparent times of HEVELIUS, and the computed clock-corrections:—

Mean Times.	Diff. from HEVELIUS.	Clock-correction.
h *m* *s*	*m* *s*	*m* *s*
9 11 34	− 14 14	− 12 12
9 24 50	− 14 14	− 12 20
11 1 39	− 14 58	− 13 36

The equation of time is actually $14^m\ 3^s$. The first two altitudes agree well enough with this. But, in the case of the last, there is clearly an error of about ten minutes in printing the clock-time: it may be assumed that the minutes should be 15 instead of 5. But there is still a discrepancy of more than a minute between the correction from this and from the first two altitudes. A change of 5′ in the altitude will reduce the difference from HEVELIUS to $14^m\ 23^s$, and the clock-correction to $13^m\ 1^s$. The mean of this, and of that computed from the altitude as given, is $13^m\ 18^s$, which I shall accept as the most probable result of the altitude. The first two altitudes give a result 1^m less.

Notwithstanding the lapse of two hours, I consider them entitled to some little weight in the result, and shall, therefore, adopt the clock-correction $13^m 5^s$, which gives for the time of occultation $11^h 6^m 55^s$.

The probable error of clock-correction may be estimated at 30^s, and that of the observed clock-time at 15^s. We then have, for the Greenwich mean time of the occultation,

$$9^h 52^m 19^s \pm 35^s.$$

To this probable error of time is to be added the uncertainty whether the actual occultation was really seen, as it must have taken place at the bright limb.

Page 217.—*Occultatio Clarae Boreal in fronte Scorpii*, 1660, 27 *Apr. manè.*

	h m s		° ′ ″		
Horolog.	1. 32. 57.	Alt. Spica	16. 43. 0.	Temp. ex altitu.	1. 38. 15.
	1. 49. 35.	" Arcturi	47. 58. 0.		1. 54. 3.
	1. 50. 10.	" "	47. 52. 0.		1. 54. 56.
	2. 34. 30.	Exitus Stella.	Optime conspeximus.		2. 39. 0.
	3. 30. 30.	Alt. Arct.	34. 42. 0.		3. 35. 34.
	3. 36. 15.		33. 46. 0.		3. 42. 7.
	3. 38. 35.		33. 29. 0.		3. 44. 6.

The clock-corrections resulting from these altitudes are:—

$$(1) + 4^m 42^s$$
$$(2) + 3^m 31^s$$
$$(3) + 3^m 48^s$$
$$(4) + 3^m 50^s$$
$$(5) + 4^m 36^s$$
$$(6) + 4^m 15^s.$$

The resulting mean clock-correction is $+ 4^m 7^s$, and the probable error of both clocks and observations about 8^s. The Greenwich mean time of the occultation is therefore $13^h 24^m 1^s \pm 12^s$.

Page 235.—*Occultatio Spicae Virginis*, 1660. *die Jovis*, 17 *Juni. vesp.*

Horolog. h. m. s.		Altitudines. °. ′. ″.	Tempus ex altitud. °. ′. ″.	
9. 51. 10.	Arcturi . .	51. 38. 0.	9. 53. 10.	
9. 56. 15.	Spicae . .	18. 2. 0.	9. 59. 29.	
10. 0. 0.	Marg. ☾ Sup.	18. 8. 0.	10. 2. 15.	
10. 33. 35.	Arcturi . .	47. 5. 0.	10. 36. 10.	
10. 37. 20.	Marg. ☾. sup.	14. 0. 0.	10. 39. 30.	
10. 54. 0.			10. 56. 0.	Obtegebatur Spica, ♍ a Lunâ circa parte sc. obscuram.
11. 32. 20.	Arcturi . .	39. 45. 0.	11. 33. 33.	
11. 39. 10.			11. 41. 30.	Adhuc post Lunam latebat Spica.

Animadvertenda.

Postmodum nubes Lunam coelumque tegebant, ut nihil amplius de exitu Spicae deprehendere potuerimus.

The following are the results of the altitudes of stars:—

Clock Times.	Computed Mean Times.	Diff. from HEVELIUS.	Clock-correction.
h m s	h m s	m s	m s
9 51 10	9 53 21	+ 0 11	+ 2 11
9 56 15	9 59 57	+ 0 28	+ 3 42
10 33 35	10 36 19	+ 0 9	+ 2 44
11 32 20	11 33 41	+ 0 8	+ 1 21

The mean of the four clock-corrections is +2^{m} 30^{s} ± 12^{s}. But the small correction resulting from the last altitude gives rise to at least a suspicion of a large clock-rate. The rate deduced from the observations by least squares is — 0^{s}.88 per minute, and the correction at the time of occultation will become +2^{m} 7^{s}. But the existence of so large a rate seems quite improbable. I shall therefore adopt +2^{m} 25^{s} ± 13^{s} as the most probable correction at the moment of occultation. This will give for the local mean time 10^{h} 56^{m} 25^{s}, and

$$9^{h}\ 41^{m}\ 49^{s} \pm 20^{s}$$

as the probable Greenwich time of the occultation.

Page 301.—*Eclipsis Solaris, Anno* 1661, *die* 30. *Martii.*

Quantitas Phasium Observata.	Horologium Ambulatorium.	Horologium perpendiculi.	Altitudines Solis.	Tempus correctum.	Animadventenda. Amb. Clock Corr. M. T.
.	9. 1. 21.	9. 1. 21.	28. 23. 0.	9. 3. 9.	+ 7^{m}. 15^{s}.
.	9. 2. 35.	9. 2. 36.	28. 35. 0.	9. 4. 54.	7 43
.	9. 10. 29.	9. 10. 10.	29. 29. 0.	9. 12. 58.	dub. 7 49
.	9. 45. 35.	9. 45. 13.	33. 0. 0.	9. 47. 23.	+ 7 2
Initium.	10. 12. 3.	10. 11. 41.	. . .	10. 13. 15.	Initium circa 117° à puncto Zenith contigit.
¼.Dig.	10. 13. 25.	10. 13. 5.	. . .	10. 14. 37.	
⅜.	10. 13. 53.	10. 13. 33.	. . .	10. 15. 4.	
⅝.	10. 15. 42.	10. 15. 24.	. . .	10. 16. 56.	
⅞.	10. 17. 8.	10. 16. 52.	. . .	10. 18. 22.	
1 d.& amplius.	10. 18. 31.	10. 18. 15.	. . .	10. 19. 44.	
1⅜.ferè.	10. 20. 15.	10. 19. 58.	. . .	10. 21. 27.	
1¾.	10. 23. 17.	10. 23. 0.	. . .	10. 24. 27.	
3¼.	10. 34. 24.	10. 34. 10.	. . .	10. 35. 31.	
4⅜.	10. 43. 11.	10. 43. 5.	. . .	10. 44. 20.	
5⅝.	10. 51. 53.	10. 51. 48.	. . .	10. 52. 58.	
5⅞.	10. 52. 49.	10. 52. 45.	. . .	10. 53. 54.	
6 d. & amp.	10. 54. 36.	10. 54. 31.	. . .	10. 55. 40.	Portio circuli Lunaris per centrum Solis transiens, vel obscurata pars Solis, hora 10. 55′ continebat in Limbo Solari 122°.
6⅜.	10. 55. 31.	10. 55. 26.	. . .	10. 56. 34.	
6⅝.	10. 57. 26.	10. 57. 23.	. . .	10. 58. 29.	
7.circiter.	11. 1. 56.	11. 1. 55.	. . .	11. 3. 0.	
7.paulò plus.	11. 5. 6.	11. 5. 0.	. . .	11. 6. 4.	Ratio Diametri ⊙ ad Diamet. ☾. observat, est ut 1000 ad 1105. Data igitur semid. ⊙ ex meis observatis 15′ 54″ provenit semid. ☽ in hac Eclipsis 16′ 24″.
7⅛.circi.	11. 6. 19.	11. 6. 15.	. . .	11. 7. 17.	
7⅝.	11. 12. 10.	11. 12. 11.	. . .	11. 13. 8.	
7¾.	11. 14. 15.	11. 14. 14.	. . .	11. 15. 9.	
7⅛.	11. 33. 44.	11. 33. 41.	. . .	11. 34. 34.	Max. obsc. 11. 20.
6^{1}.ferè.	11. 46. 54.	11. 56. 50.	. . .	. . .	
4½.ferè.	11. 57. 47.	11. 57. 45.	. . .	. . .	
4⅛.	11. 59. 36.	11. 59 31.	. . .	. . .	
3¾.	12. 1. 20.	12. 1. 19.	. . .	. . .	
2¾.	12. 8. 25.	12. 8. 20.	. . .	. . .	
2⅝.	12. 9. 32.	12. 9. 28.	. . .	. . .	
2½.fer .	12. 11. 0.	12. 11. 0.	. . .	. . .	
2¼.	12. 12. 15.	12. 12. 15.	. . .	. . .	
2⅛.	. . .	12. 13. 0.	. . .	. . .	
2.paulò plus.	12. 13. 45.	12. 13. 45.	. . .	. . .	
1⅞.ferè.	12. 15. 15.	12. 15. 15.	. . .	. . .	
1¾.	12. 16. 10.	12. 16. 10.	. . .	. . .	
1⅝.	12. 17. 0.	12. 17. 0.	. . .	. . .	
1½.ferè.	12. 18. 20.	12. 18. 17.	. . .	. . .	
1¼.	12. 19. 20.	12. 19. 19.	. . .	. . .	
1⅛.	12. 19. 57.	12. 19. 57.	. . .	. . .	
1.ferè.	12. 21. 9.	12. 21. 9.	. . .	. . .	
¾.	12. 22. 8.	12. 22. 8.	. . .	. . .	
½.	12. 23. 34.	12. 23. 34.	. . .	. . .	
.	. . .	. . .	39. 21. 40.	12. 26. 17.	
Finis.	12. 26. 39.	12. 26. 40.	. . .	12. 27. 3.	Finis circa 81° à puncto Zenith. occidit.
.	12. 51. 55.	dub.	38. 33. 20.	12. 51. 46.	+ 2′ 2″ + 6 18
.	12. 57. 49.	. . .	38. 16. 35.	12. 58. 6.	1 57 6 39
.	12. 58. 49.	. . .	38. 13. 25.	12. 59. 14.	1 52 6 42
.	1. 0. 35.	. . .	38. 7. 30.	1. 1. 17.	1 47 6 54.

Animadvertenda.

Instante hâc Eclipsi Solis, omnem ad hibuimus operam, ut cùm longè ex optatissimo nostro hospite Dn Ismaeli Bullialdo, omnia illa, quae ad eclipsin observandam spectare arbitrabar, essent in promtu; imprimus, duas cameras obscuratas adornavi, alteram pro Majoribus, alteram pro Minoribus, qui in magnâ aderant frequentiâ, et quidem eâ ratione, quâ videbantur commodiores. Multo manè die 30 Martii, oriente Sole, quamquam Coelum undiquè erat serenum, sub horam tamen octavam nubibus satis obscuris obduci coepit, adeo ut Solem Quadrante, nec Majori, nec Minori nostro aeneo rimari potuerimus. Horâ verò 9, aër pabulùm attenuabatur, ut satis accuratè altitudines Solares caperentur: quo tempore Horologium tam perpendiculare, quam usitatum ambulatorium, unâ cum Sciaterico in minutis distributo, praecisè admodum conveniebat.

Hora 9. 30′, Cameram ingressi sumus oculos defixos omnino in Tabulâ observatoriâ, praesentibus praecipuis Nostrae Urbis Luminibus, tenentes, ne nobis initium, quod instare judicabam, elaberetur. Huic nostro proposito Coelum tum clarâ etiam facie annuit, sic ut ipsum Lunae sub Solem ingressum, punctumque attactus dilucide admodum conspiceretur, in 117° à puncto verticali, occasum versùs; & quidem primùm à Praeclarissimo Bullialdo minime otiosum se praebente spectatorem.

* * * * Semidiametrum Lunae notabiliter minorem esse, in hoc deliquio, quàm quidem Calculus promiserat; quae in peculiari chartâ, ex tribus in peripheriâ Lunae, à tribus diversis observationibus, simul notatis punctis, multoties explorata est.

* * * phasin tamen istam maximam accuratè obtinuimus: 7¾ digit. nempè haud fuisse majorem. * * *.

Hora 12 26′ 17″ alto Sole 39° 21′ 40″. Quadrante Azimuthali nostro, in alterâ satis longè dissita speculâ nostrâ constituto, alius Observator, harum rerum alias bene gnarus, finem Eclipsis in pinnacidio Quadrantis, per nudum foramen deprehendit.

Quod etsi cum nostro, ope Telescopii, in Camerâ obscuratâ, annotato finè, in upsis secundis non conveniat (nec sane adeo occuratè istâ ratione unquam fieri potest.) tamen lubens etiam hanc Observationem apponere volui; quò videas in ista minùs accuratâ observatione, non nisi 46″ aberratum esse: quod profectò nullius est momenti, * * * *.

Rejecting the altitudes within half an hour of noon, the eight others give the following clock-corrections:—

Hor. amb.			Corr. to Hor. amb.		Corr. to Hor. perp.	
h	*m*	*s*	*m*	*s*	*m*	*s*
9	1	21	+ 7	15	+ 7	15
	2	35	7	43	7	42
	10	29	7	49	7	68
	45	35	7	2	7	24
12	51	55	+ 6	18	.	.
	57	49	6	39	.	.
	58	49	6	42	.	.
	60	35	6	54	.	.

Taking the means, we have:—

At $9^h.25$, corr. Hor. amb. $+ 7^m\ 27^s$; corr. Hor. p. $+ 7^m\ 38^s$.
At $12^h.93$, corr. Hor. amb. $+ 6^m\ 38^s$; corr. Hor. p. $+ 6^m\ 38^s$. (?)

These corrections being interpolated to the times of observation, the mean result from the two clocks is taken as the local mean time.

Page 330.—*Occultatio Saturni*, 1661. 3 *Augusti Vesp. st. n.*

There is only a single column of times, which is headed "Tempus ex horolog; aestimat simul correctum". I am therefore in doubt how the observations were made. The following extracts are all that can be of any use:—

Tempus ex &c:—

		° ′ ″
7. 58. 0.	♄ Limb. ☽ stringebat.	
7. 58. 20.	Verum initium occult. Subivit dimidio copore quantum conjicere licuit.	
7. 59. 50.	Tertia pars adhuc videri potuit.	
8. 0. 25.	Saturnus totus occultat.	
8. 6. 30.	Alt. ☽ limb. sup. 16° 22′ circ.	
9. 3. 35.	Initium emersionis.	
9. 4. 0.	Jam major particula de ♄ apparuit.	
9. 4. 10.	Finis occultationis. Mediū ♄ corp. visū.	
9. 4. 35.	Nondū totus cōspect.	
9. 4. 45.	Finis totalis emersionis.	
9. 50. 53.	Altit. Arcturi	27. 31. 0.
9. 54. 36.	" Scheat Pegasi	38. 53. 0.
9. 57. 44.	" " "	39. 20. 0.
11. 1. 36.	" Schedir. Cassiop.	53. 13. 0.
11. 7. 7.	" Capella	17. 56. 0.
11. 8. 46.		18. 4. 0.
11. 11. 30.		18. 17. 0.

Besides having to take the times entirely on credit, these observations are subject to other sources of doubt. That Saturn should have appeared half-covered, "quantum conjicere licuit", twenty seconds after it touched the moon, while one third was still visible a minute and a half longer, is something difficult to accept, even making all allowance for uncertainty of observation, and leads to a suspicion of an error of a minute in the second time.

Page 419.—*Occultatio trium Stellularum in Capite Tauri* 1663, 14 *Mar. vesperi.* Stellula inferior A quartae magnitudinis, cujus longitudo est 1° 54′ ♊ & Lat. 5° 33′ Aust. * * St. B. Austral. sequentium.

Tempus sec. hor. amb.

H. M. S.		
8. 53. 30.	Initium occultationis, * A.	
8. 55. 0.	Altitudo Arcturi	27°. 3′.
9. 42. 0.	" "	34. 12.
9. 44. 0.	Principium occultationis, * B.	
9. 47. 0.	Initium occultationis, * C.	
9. 52. 30.	Altitudo Arcturi	35°. 42′.

The clock-corrections given by the three altitudes are:—

$$(1)\ +45^{m}\ 45^{s}$$
$$(2)\ +48^{m}\ 5^{s}$$
$$(3)\ +48^{m}\ 10^{s}.$$

The clock-corrections I shall adopt are, for the first occultation, $+45^{m}\ 55^{s}$; and, for the two others, $+48^{m}\ 7^{s}$. The Greenwich mean times of the occultations will then be:—

Star A (71 Tauri)	$8^{h}\ 24^{m}\ 49^{s} \pm 40^{s}$
Star B (θ_1 or θ_2 Tauri)	$9^{h}\ 17^{m}\ 31^{s} \pm 25^{s}$
Star C (θ_2 or θ_1 Tauri)	$9^{h}\ 20^{m}\ 31^{s} \pm 25^{s}$.

Page 423.—1663, *Aug.* 18. *Occultation of a star during lunar eclipse.*

Horol. amb.		° ′	Temp. corr.
8. 51. 28.	Alt. Arcturi . . .	27. 58.	8. 52. 52.
8. 53. 53.	" " . . .	27. 39.	8. 55. 3.
9. 11. 36.	Stella jam occultata.	. .	9. 13. 0.
9. 42. 43.	Alt. Lucidae Coronae.	37. 31.	9. 43. 35.
9. 44. 48.	" " "	37. 12.	9. 45. 45.
9. 46. 36.	☽ Limbi superioris.	16. 54.	9. 47. 36.
10. 1. 30.	Stella rursus prodiit	. .	10. 2. 30.
11. 14. 37.	Alt. Lyrae, . . .	58. 37.	11. 15. 11.
11. 18. 4.	. . . .	58. 11.	11. 19. 2.
11. 19. 40.	. . . .	57. 45.	11. 21. 17.
12. 8. 46.	. . . .	50. 39.	12. 10. 3.
12. 10. 25.	. . . .	50. 26.	12. 11. 39.

The results of the altitudes of stars are:—

Mean Times.	Diff. from HEVELIUS.	Clock-correction.
h m s	*m s*	*m s*
8 55 40	+ 2 48	+ 4 12
8 57 50	+ 2 47	+ 3 57
9 46 30	+ 2 55	+ 3 47
9 48 40	+ 2 55	+ 3 52
11 17 54	+ 2 43	+ 3 17
11 21 3	+ 2 1	(+ 2 59)
11 24 12	+ 2 55	+ 4 32
12 13 8	+ 3 5	+ 4 22
12 14 37	+ 2 58	+ 4 12

The equation of time was $+3^{m}\ 15^{s}$, so that the apparent times of HEVELIUS seem about 20^{s} too small.

The sixth correction may be rejected on account of the discrepancy between the altitude and the time computed by HEVELIUS. The mean of all the other clock-corrections is $+4^{m}\ 1^{s}$, and there does not seem to be any sensible clock-rate.

Applying this correction, we have:—

Greenwich mean time of immersion of e^2 Aquarii . $8^{h}\ 1^{m}\ 1^{s} \pm 12^{s}$
Greenwich mean time of emersion of e^2 Aquarii . $8^{h}\ 50^{m}\ 55^{s} \pm 12^{s}$

Page 435.—*Occultatio Palilicii,* 1664, *die* ☽ *vesp.* 31 *Martii, quarta die post* ☌.

Temp. sec. hor. amb. H. M. S.			
9. 14. 11.	Initium occult. Palilicii à ☽.		
9. 17. 30.	Altitudo Procyonis . . .	31.° 22.′ 0.″	Quad. p. Or.
9. 19. 35.	" " . . .	31. 10. 0.	
10. 4. 20.	Finis occult.		
10. 7. 50.	Altitudo Procyonis . . .	25. 2. 0.	
10. 9. 57.	" " . . .	24. 47. 0.	

The clock-corrections resulting from the four altitudes are:—

(1) $+\ 10^{m}\ 20^{s}$
(2) $+\ 9^{m}\ 58^{s}$
(3) $+\ 11^{m}\ 50^{s}$
(4) $+\ 11^{m}\ 43^{s}$.

I adopt the clock-corrections $+10^{m}\ 9^{s}$ for immersion, and $+11^{m}\ 46^{s}$ for emersion. The results are:—

Greenwich mean time of immersion	$8^{h}\ 9^{m}\ 44^{s} \pm 18^{s}$
Greenwich mean time of emersion	$9^{h}\ 1^{m}\ 30^{s} \pm 18^{s}$.

Page 474.—*Eclipsis Solaris* 1666, 2 *Julii manè.*

Quantitas Phasium.	Temp. aestimatum secundum Horolog. Amb.	Tempus Correctum.				
	H. M. S.					
Initium.	6. 55. 30.	6. 57. 30.	8⅜.	7. 55. 45.	. . .	
⅜.dig.	6. 57. 30.	6. 59. 30.	8⅜. paulò minus	7. 59. 5.	. . .	
¾.	7. 0. 23.	7. 2. 23.	8⅕.	8. 6. 30.	8. 8. 30.	
1⅛.	7. 2. 30.	7. 4. 30.	7¾.	8. 11. 25.	8. 13. 25.	Hic, semid. ☽ ad 8″ vel 9″ major apparuit.
1½.	7. 4. 50.	7. 6. 50.	7¼. ferè.	8. 17. 30.	8. 19. 30.	
1⅜. ferè.	7. 10. 57.	7. 12. 57.	7. ferè.	8. 19. 41.	8. 21. 41.	
3⅜.	7. 14. 59.	7. 16. 59.	5⅞.	8. 28. 8.	8. 30. 8.	
3¾.	7. 17. 50.	7. 19. 50.	5½. ferè.	8. 30. 14.	8. 32. 14.	
4⅜.	7. 21. 35.	7. 23. 35.	4¾.	8. 36. 25.	8. 38. 25.	
4⅔.	7. 23. 43.	7. 25. 43.	3⅝.	8. 43. 19.	8. 45. 19.	
5¼.*	7. 27. 53.	7. 29. 53.	3¼.	8. 46. 12.	8. 48. 12.	
6.	7. 31. 50.	7. 33. 50.	3.	8. 47. 32.	8. 49. 32.	
6¾.	7. 36. 55.	7. 38. 55.	2¾.	8. 50. 57.	8. 52. 57.	
6⅞. paulò plus.	7. 38. 5.	7. 40. 5.	2¼. ferè.	8. 54. 15.	8. 56. 15.	
7⅛.	7. 39. 45.	7. 41. 45.	1⅜.	8. 58. 24.	9. 0. 24.	
7¼. paulò plus.	7. 42. 30.	7. 44. 30.	1⅛.	8. 59. 35.	9. 1. 35.	
7½.	7. 44. 6.	7. 46. 6.	0⅚.	9. 1. 38.	9. 3. 38.	
7⅔.	7. 46. 0.	7. 48. 0.	0½.	9. 3. 20.	9. 5. 20.	
8. ferè.	7. 48. 25.	7. 50. 25.	Finis.	9. 6. 53.	9. 8. 53.	
8⅛.	7. 51. 15.	7. 53. 15.				
8¼. paulò plus.	7. 53. 37.	7. 55. 37.	⊙ alt.			
⊙ alt.			47. 33. 0.	9. 23. 6.	9. 25. 28.	
17. 45. 0.	5. 51. 11.	5. 53. 12.	47. 42. 0.	9. 24. 16.	9. 26. 45.	
18. 37. 0.	5. 57. 5.	5. 59. 28.	48. 10. 0.	9. 28. 29.	9. 30. 40.	
18. 55. 0.	6. 0. 0.	6. 1. 28.	48. 28. 0.	9. 30. 36.	9. 33. 12.	

*Semid. ☽ aequalis extitit Solari.

The "notanda" which follow contain nothing worthy of remark.

The corrections to reduce the clock to mean time, as given by the individual altitudes, are as follows:—

Hor. amb.	Corr.
h *m* *s*	*m* *s*
17 51 11	+ 5 48
17 57 5	6 4
18 0 0	5 16
21 23 6	+ 5 53
21 24 16	5 58
21 28 29	5 36
21 30 36	5 56

The mean correction derived from the first group is $+5^{m}\,43^{s}$, and from the last $+5^{m}\,51^{s}$. The uncertainty of the corrections is as great as their difference; we therefore adopt the constant correction $+5^{m}\,47^{s}$ to reduce the clock to mean time.

Page 550.—1671, *March* 14. *Occultation of two stars.*

			° ′ ″	
Hor. amb.	7. 16. 40.	Alt. Palilicii, ...	40. 36. 0.	Quad p. Or.
	7. 35. 30.	Alt. mer. Pollucis, ...	64. 23. 40.	Quad Az. M.
	8. 10. 20.	Alt. Palilicii, ...	33. 40. 0.	
	8. 12. 15.	" "	33. 29. 0.	
	8. 51. 0.	Stellula incognita supra medium caudam ♈ à ☽ corniculatâ tecta.		
	8. 54. 0.	Media caudâ ♈ à Luna têcta.		
		Alt. Palilicii, ...	27. 29. 0.	
	9. 42. 0.	Initium emersionis Mediae caudae ♈.		
	9. 57. 40.	Alt. Humeri dextri Orionis, .	22. 29. 0.	
	10. 0. 0.	" " " " .	22. 12. 0.	

The following are the results for clock-corrections:—

Clock Times.	Mean Times from Altitudes.	Clock-correction.	*C′*.
h *m* *s*	*h* *m* *s*	*m* *s*	*m* *s*
7 16 40	7 27 47	+ 11 7	+ 11 0
8 10 20	8 21 58	+ 11 38	+ 11 53
8 12 15	8 23 18	+ 11 3	+ 11 55
8 54 0	9 6 9	+ 12 9	+ 12 37
9 57 40	10 12 14	+ 14 34	+ 13 41
10 0 0	10 14 17	+ 14 17	+ 13 43

The clock-corrections are quite uncertain, owing to uncertainty whether the difference of three minutes between the clock-correction given by Aldebaran and that given by α Orionis is the result of clock-rate, or of systematic error in the observations of one of the stars. If we suppose a rate of one minute per hour, the mean correction will be as in the last column. I shall adopt this correction as on the whole the most probable. The results are:—

Greenwich mean time of immersion of star . .	$7^h\ 48^m\ 58^s \pm 25^s$
Greenwich mean time of immersion of star . .	$7^h\ 52^m\ 1^s \pm 25^s$
Greenwich mean time of emersion of star . . .	$8^h\ 40^m\ 49^s \pm 40^s$.

I have not succeeded in identifying these stars. The descriptions would seem to refer to δ and ε Arietis, but neither of them were near the computed position of the moon's limb at this time.

Occultatio Spica Virginis, 1671. 22 Aprilis.

	H. M. S.				H. M. S.
Horol. Amb.	9. 52. 45.	Altitudo Pollucis	35. 27. 0.	Temp. Corr.	9. 56. 21.
	9. 55. 20.	" "	35. 8. 0.		9. 58. 32.
	10. 45. 33.	Initium Occultationis. . . .			10. 47. 56.
	11. 15. 5.	Alt. ☽ limb. infer.	25. 50. 0.		11. 17. 25.
	11. 54. 0.	Spica necdum conspecta.			
	11. 55. 0.	Adhuc debitescebat.			
	11. 55. 30.	Spica emersit. Finis occult.			11. 57. 10.
	12. 0. 39.	Alt. Reg.	26. 18. 0.		12. 2. 14.
	12. 2. 9.	" "	26. 3. 0.		12. 4. 0.
	12. 36. 55.	Alt. Lyrae.	49. 39. 0.		12. 39. 45.
	12. 39. 23.	" "	49. 50. 0.		12. 41. 0.

HEVELIUS gives altitude of Regulus 36. 18. 0. at the moment of immersion; also, "Emersionsis Stellae accuratissime deprehensum est". The mean times computed from the altitudes compare with those of HEVELIUS as follows:—

Mean Times.	Diff. from HEVELIUS.	Clock-correction.
h m s	*m s*	*m s*
9 54 52	— 1 29	+ 2 7
9 57 30	— 1 2	+ 2 10
10 46 42	— 1 14:	+ 1 9
12 1 9	— 1 5	+ 0 30
12 2 55	— 1 5	+ 0 46
12 38 21	— 1 24	+ 1 26
12 39 37	— 1 23	+ 0 14

The mean result is that at $11^h\ 26^m$ the clock-correction was $+ 1^m\ 12^s$. I shall admit a rate of — 24 seconds per hour. The results will then be:—

Greenwich mean time of immersion	$9^h\ 32^m\ 25^s \pm 15^s$
Greenwich mean time of emersion	$10^h\ 41^m\ 54^s \pm 15^s$.

Page 564.—Occultation of Saturn, 1671. June 1. manè. The times are so discordant that the observations seem worthless. Here, however, are the observations:—

Horolog. ambulat.			temp. corr.
2. 49. 50.	Altitudo Lyrae	71.° 8.′	2. 50. 31.
2. 52. 0.	" "	70. 50.	2. 53. 44.

2. 53. 32. Altitudo Lyrae . . . . dub. 70.° 32.′ . . . . 2. 56. 51.
3. 38. 15. ♄ Tegi incipiebat . . . . 3. 38. 15.
3. 38. 39. ♄ omnino tectus; alt. ☽ limb. inf. 16.° 57.′ . . . . 3. 38. 39.
3. 46. 0. Alt. ☉ . . . . circa 1.° 0.′ 0.″ . . . . 3. 46. 0.
5. 21. 21 " " . . . . 12. 40. . . . . 5. 22. 5.
5. 26. 58 " " . . . . 13. 17. . . . . 5. 26. 38.
5. 31. 29 " " . . . . 13. 42. . . . . 5. 29. 42.

Page 615.—*Occultatio Plejadum.* 1672. Novem. 6. manè.

H. M. S.
Horolog. amb. 12. 51. 0. Plejadum praecedens omnium *a* Num. tecta à ☽.
1. 2. 45. In cuspide occid. *b* Num. 1 à ☽ tecta ad Stagnum Miris supra Paludem Maraeotidem.
1. 21. 31. Plejadum Lucidam proximè praecedens *d* tecta ad Montem.
h. m. s.
Acabe & Paludem Arabiae . . . . 1. 24. 0.
2. 22. 0. Altitudo Procyonis, 34.° 59.′ . . . . 2. 24. 15.
2. 24. 26. " " 35. 14. . . . . 2. 27. 3.

The altitudes of Procyon give:—

Mean Times.	Diff. from Hevelius.	Clock-correction.
h *m* *s*	*m* *s*	*m* *s*
14 7 27	− 16 48	− 14 33
14 10 5	− 16 58	− 14 21

The differences from Hevelius exceed the equation of time by 48ˢ and 58ˢ respectively. The clock-correction at 14ʰ 23ᵐ is — 14ᵐ 27ˢ ± 17ˢ. The interval of one hour and more between this time and that of the occultations considerably increases the uncertainty. The resulting Greenwich times are:—

Immersion of Coeleno	11ʰ 21ᵐ 57ˢ ± 30ˢ
Immersion of Taygeta	11ʰ 33ᵐ 42ˢ ± 28ˢ
Immersion of Maia	11ʰ 52ᵐ 28ˢ ± 25ˢ.

Page 628.—*Occultatio Pleiadum.* 1673. Martii. 22. Die ☿, vesp.

Horolog. amb. 7. 21. 30. Altitudo Palilicii . . . 35.° 50.′ Temp. corr. 7. 24. 57.
7. 55. 0. Praecedens Num. 1. *b*. In cuspide Occidentali Plejadum à Luna . . . tegebatur . . . . . . 7. 58. 0.
7. 58. 0. Plejadum una, sed Globo haud adscripta, tecta fuit . . . . 8. 1. 0.
8. 7. 0. Altitudo Palilicii . . 29. 39. . . . . . 8. 10. 8.
8. 9. 0. Alia Pl. N. 4. ex illis arctioribus duabus praecedens . . . rursus tecta . . . . 8. 12. 0.
8. 14. 0. Ex his posterior Num. 5. tecta fuit fere eo ipso ☽ loco . . . . 8. 17. 0.
8. 57. 10. Altitudo Procyonis . . 36.° 55.′ . . . . . . 9. 0. 52.

Comparison of HEVELIUS's times with the mean times computed from the altitudes:—

Mean Times.	Diff. from HEVELIUS.	Clock-correction.
h *m* *s*	*m* *s*	*m* *s*
7 32 25	+ 7 28	+ 10 55
8 17 35	+ 7 27	+ 10 35
9 7 58	+ 7 6	+ 10 48

The mean clock-correction is $+10^m 46^s$, and there is no evidence of any sensible rate. Adopting this correction, the results are:—

Greenwich mean time of immersion of Taygeta .	$6^h 51^m 10^s \pm 25^s$
Greenwich mean time of immersion of *m* Pl.	$6^h 54^m 10^s \pm 25^s$
Greenwich mean time of immersion of Asterope . .	$7^h 5^m 10^s \pm 25^s$
Greenwich mean time of immersion of *l* Pl.	$7^h 10^m 10^s \pm 25^s$.

Page 658.—*Occultatio Pleiadum* 1674 Augusti 24. manè Die ♀.

Horolog. amb.	12. 57. 30.	Altitudo Aquilae 26. 51. dub. . temp. cor.	12. 59. 54.
	12. 59. 30.	" " 26. 31.	1. 2. 27.
	1. 37. 0.	St. inf. praecedens occultatu	1. 40. 0.
	2. 4. 30.	Praecedens omnium N. 1 Lunam subingressa.	2. 7. 30.
	2. 21. 30.	Inferiorum seq. N. 5. Lunam subiit . . .	2. 24. 30.
	2. 28. 0.	Praecedens omnium rursus in conspectum prodiit	2. 31. 0.
sic.	2. 39. 30.	Lucidam praecedens N. 4. circa limbum superiorem ☽ (ubi praeced. om.) tecta est	2. 39. 30.
	2. 47. 0.	Inferiorem praecedens sese rursus sistebat.	2. 50. 0.
	2. 57. 0.	Lucida Pl. sese subduxit	3. 0. 0.
	3. 0. 0.	Lucidam praecedens exiit	3. 3. 0.
	3. 6. 40.	Altitudo Markab. Pegasi. 39.° 23.′ . . .	3. 9. 38.
	3. 12. 20.	Inferiorem sequens emersit	3. 15. 20.
	3. 45. 15.	Altitudo Capitis Andromedae 54.° 12.′ .	3. 48. 16.
	4. 3. 55.	Lucida Plejadum N. 6. rursus illuxit . .	4. 6. 55.

The results of the altitudes are:—

Mean Times.	Diff. from HEVELIUS.	Clock-correction.
h *m* *s*	*m* *s*	*m* *s*
13 1 38	+ 1 44	+ 4 8
13 4 10	+ 1 43	+ 4 40
15 11 10	+ 1 32	+ 4 30
15 49 52	+ 1 36	+ 4 37

The mean clock-correction is $+4^m 29^s$, which I shall consider constant. The mean times thus resulting are given in a subsequent section.

The equation of time is + 1^{m} 57^{s}, so that the mean systematic difference from HEVELIUS is about 20^{s}.

Page 684.—*Occultation during lunar eclipse*, 1675, ♀, January 11, ev.

The clock-times are not given, but only those corrected.

H. M. S.	
8. 0. 50.	Stellula *b* tecta alt. M. Eoum; sed exire illam non deprehendi.
8. 35. 20.	Stellula suprema à Tergo Pollucis *c* omnino tecta.
8. 51. 25.	Stellula *d* ad ipsum Limbum inferiorem tecta.
9. 9. 10.	Haec eadem Stella *c* rursus emersit.

The altitudes from which the clock was corrected, taken before and after the eclipse, are given as follows:—

Tempus sec. horol. ex altit. corr. h m s		° ′ ″
6 22 18	Altitudo Caudae Cygni .	39 3 0
6 25 4	Altitudo Caudae Cygni .	38 41 0
10 58 35	Altitudo Lucidae ♈ . .	28 52 0
11 11 33	Altitudo Capellae . . .	70 11 0
11 15 20	" " . . .	69 39 0
11 16 59	" " . . .	69 24 0
11 18 37	" " . . .	69 11 0

The mean times computed from certain of these altitudes compare as follows with the apparent times given by HEVELIUS:—

HEVELIUS'S App. Time.	Computed Mean Time.	Eq. Time.	App. Time.	App. Error of HEVELIUS.	Corr. to HEVELIUS on Mean Time.
h m s	*h m s*	*m s*	*h m s*	*m s*	*m s*
6 22 18	6 30 20	+ 8 55	6 21 25	+ 0 53	+ 8 2
6 25 4	6 33 5	+ 8 55	6 24 10	+ 0 54	+ 8 1
10 58 35	11 5 55	+ 8 59	10 56 56	+ 1 39	+ 7 20
11 11 33	11 18 57	+ 9 0	11 9 57	+ 1 36	+ 7 24
11 18 37	11 26 0.	+ 9 0	11 17 0	+ 1 37	+ 7 23

The deviation of more than a minute from HEVELIUS is embarrassing; but I can get no other result from his altitudes than that given. I shall therefore take + 7^{m} 42^{s} as the corrections to reduce the times given by HEVELIUS to mean time, from which we shall have:—

	Local mean time.	Greenwich mean time.
Immersion of * *b*	8^{h} 8^{m} 32^{s}	6^{h} 53^{m} 56^{s}
Immersion of * *c* (85 Geminor.) . . .	8^{h} 43^{m} 2^{s}	7^{h} 28^{m} 26^{s}
Immersion of * *d*	8^{h} 59^{m} 7^{s}	7^{h} 44^{m} 31^{s}
Emersion of * *c* (85 Geminor.) . . .	9^{h} 16^{m} 52^{s}	8^{h} 2^{m} 16^{s}.

Page 714.—*Solar eclipse* of 1675, June 23, A. M.

He seems to have used no clock at all, but to have got all his times from a sundial, giving only the minutes.

Page 768.—*Eclipsis Solis.* 1676. Die Jovis 11 Junii *ante merid.*

Here it is a little doubtful how Hevelius got his times. His first column is on the first page headed "Juxta Sciater. & Horolog. Oscil.", and on the second page "Tempus juxta Sciatericum". But all the times are given accurately to seconds.

Juxta Sciater. & Horolog. Oscil.	Altitudo Solis.	Tempus ex alt. correctum	Magnit. Phasium Digit.				
7. 58. 10.	36. 17.′	7. 58. 18.	.	10. 22. 42.	. .	10. 22. 22.	$4\frac{1}{2}$.et paulò plus.
8. 1. 30.	36. 41.	8. 1. 6.	.	10. 26. 19.	. .	10. 26. 0.	$4\frac{1}{3}$. ferè.
8. 3. 30.	37. 3.	8. 3. 39.	.	10. 35. 24.	. .	10. 35. 6.	4.dig. 22′.
9. 22. 30.	. .	9. 22. 0.	Initium.	10. 38. 53.	. .	10. 38. 38.	$4\frac{1}{4}$.ferè.
9. 24. 10.	. .	9. 23. 40.	$\frac{1}{8}$.ferè.	10. 47. 34.	. .	10. 47. 20.	4.ferè.
9. 24. 55.	. .	9. 24. 25.	$\frac{1}{2}$.	10. 53. 49.	. .	10. 53. 30.	$3\frac{5}{8}$.ferè.
9. 27. 28.	. .	9. 27. 0.	$\frac{3}{4}$.	10. 58. 17.	. .	10. 58. 8.	$3\frac{3}{8}$.
9. 29. 40.	. .	9. 29. 10.	1.	11. 5. 27.	. .	11. 5. 20.	$2\frac{7}{8}$.
9. 33. 25.	. .	9. 33. 0.	$1\frac{1}{4}$.	11. 8. 50.	. .	11. 8. 44.	$2\frac{1}{4}$.
9. 36. 35.	. .	9. 36. 5.	$1\frac{5}{8}$. fer .	11. 22. 13.	. .	11. 22. 8.	$1\frac{3}{4}$. ferè.
9. 39. 35.	. .	9. 39. 10.	2.	11. 29. 14.	. .	11. 29. 10.	$1\frac{1}{10}$.
9. 45. 49.	. .	9. 45. 25.	$2\frac{1}{2}$.	11. 35. 25.	. .	11. 35. 20.	$\frac{1}{2}$.
9. 54. 22.	. .	9. 54. 0.	$3\frac{1}{8}$.	11. 36. 59.	. .	11. 36. 55.	$\frac{1}{4}$.paulò plus.
10. 3. 44.	. .	10. 3. 22.	$4\frac{1}{2}$.	11. 37. 55.	. .	11. 37. 53.	Nondum Sol om.
10. 8. 30.	. .	10. 8. 20.	$4\frac{3}{4}$.	11. 38. 35.	. .	11. 38. 35.	Nondum.
10. 18. 17.	. .	10. 18. 0.	$4\frac{1}{5}$.ferè.	11. 29. 15.	. .	11. 39. 15.	Nondum.
. . .	. .	. . .	.	11. 39. 40.	. .	11. 39. 40.	Finis Eclipseos.
. . .	. .	. . .	.	4. 18. 10.	33. 11.	4. 18. 19.	
. . .	. .	. . .	.	4. 20. 0.	32. 57.	4. 20. 36.	

Observed Semidiameters of the Moon.

H. M.	′ ″
10. 0.	13. 53.
10. 24.	14. 0.
11. 0.	14. 50.
Ultimò.	15. 0.

Page 774.—*Occultatio Martis et quarundam Fixarum* 1676 Sept. 1. *manè.*

	H. M. S.		
Hor. amb.	1. 1. 25.	Alt. Caudae Cygni . . . . . 57.° 40.′ Temp. cor.	1. 0. 24.
	1. 36. 39.	Mars à Lunâ omninò tectus	1. 35. 42.
	1. 45. 25.	Alt. Caudae Cygni. . . . . . 51. 17.	1. 44. 7.
	2. 47. 54.	Mars emicuit; Finis nempè occultationis	2. 46. 29.
	2. 55. 0.	Alia Stellula Fixa *b* sub Marte egreditur	2. 53. 35.
	3. 19. 50.	Altitudo Scheat Pegasi. . . . 45. 3. . . .	3. 18. 19.
	3. 43. 45.	Fixa *c* ad Cuspidem Lunae inferiorem observata est.	3. 42. 20.

[Corresponds exactly with a MS. at the Paris Observatory.]

Animadvertenda.

De caetero notandum est, paallò post Martis egressum aliam insuper Stellulam Fixam *b*, Globo aliàs nondum adscriptam, vix ad 3 Min. prima infra Martem versùs Austrum, Horâ nimirùm

2 53′ 35″ exiliisse circa Paludes Amaras; quam quidem Lunam subire haud animadverti; cùm totus in eo fuerim, ut Martis momentum occultationis praecisè determinarem: * *

The results of the altitudes are:—

Mean Times.	Diff. from HEVELIUS.	Clock-correction.
h m s	*m s*	*m s*
12 59 26	— 0 58	— 1 59
13 43 26	— 0 41	— 1 59
15 17 30	— 0 49	— 2 20

The mean correction is — $2^m\ 6^s$, which may be considered constant. The Greenwich mean times will then be:—

Immersion of Mars	$12^h\ 19^m\ 57^s \pm 15^s$
Emersion of Mars	$13^h\ 31^m\ 12^s \pm 15^s$
Immersion of *b*	$13^h\ 38^m\ 18^s \pm 15^s$
Immersion(?) of *c*	$14^h\ 27^m\ 3^s \pm 25^s$.

I have not succeeded in identifying the two stars. They are probably too small to be in the accurate catalogues.

Page 814.—*Occultatio duarum Stellularum in Clavâ Orionis* 1678. Mart. 28 ☽ vesp.

	H. M. S.	
Hor. amb.	7. 31. 0.	Luna tegit praecedentem in Clava Orionis.
	9. 16. 0.	Luna tegit aliam Stellulam hactenus incogn.*
	9. 17. 0.	Alt. Procyonis 33. 18. 0.
	9. 19. 0.	" " 33. 4. 0.

Nam illa praecedens in Clavâ Orionis hoc tempore anno sc. currente 1678 degit secundum nostrum Catalogum in 24° 21′ 10″ ♊ & Lat. 3° 11′ 24″ Aust; sic ut omninò illa ipsa fuerit, quae prius fuit obtecta. At de altera posteriori dubito, an ea ipsa fuerit, illa scilicet in clavâ Orionis sequens; Latitudo quidem ejus, quae est 3° 21′ 19″ Aust. occultationem non prohibet omninò, sed nihilominùs adeo arctam Synodum cum priori Stellulâ non concedit. * * * * 25° 17 ♊ & Lat. 3° 13′ A.

The clock-corrections resulting from the altitudes are, respectively, $+\ 6^m\ 43^s$ and $+\ 7^m\ 1^s$; mean, $+\ 6^m\ 52^s$. The Greenwich mean times of the occultations will then be:—

First star, B. A. C. 1867 (?)	$6^h\ 23^m\ 16^s \pm 45^s$
Second star, χ^2 Orionis (?)	$8^h\ 8^m\ 16^s \pm 22^s$.

The two stars are those of the British Association Catalogue nearest the moon's limb; but it is doubtful whether they are really the occulted stars.

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* In the original MS. at Paris the minutes were first 14, and were changed to 16.

From the Annus Climactericus of HEVELIUS, *Gedani, MDCLXXV.*

Page 7.—*Occultatio Lancis Austrinae* &c. 1679. Mart. 30. Manè.

Horol. amb.		Distantiae et Altitudines. gr. m. s.	Quo instrumento.	Temp. correc.
1. 48. 30.	Altitudo Reguli . . dub.	23. 27. 0.	Quadr. p. or.	. . .
2. 41. 0.	Minor Stella occultabatur .	. . .	.	2. 45. 0.
2. 48. 40.	Major Stella tegebatur . .	. . .	.	2. 52. 40.
2. 55. 0.	Alt. Arcturi	52.° 11.′	.	2. 59. 15.
2. 58. 0.	" "	51. 57.	.	3. 1. 0.
3. 16. 0.	" "	50. 3.	.	3. 21. 16.
3. 56. 40.	Emersio Minoris Stellulae .	. .	.	4. 0. 40.
4. 5. 15.	Emersio Majoris Stellulae .	. .	.	4. 9. 15.
4. 34. 0.	Alt. Arcturi	40. 46.	.	4. 38. 29.
4. 36. 0.	" "	40. 24.	.	4. 41. 14.

Stel. diff. in long. 4.′ 30.″ Lat. 3.′ ferè. Minor majorem sequatur in majori.
Lat. Bor. Long. ejus. 1660. 10.° 16.′ 0.″ ♏. et Lat. 0. 29. 30. B.

The results of the observed altitudes are:—

Mean Time.			Diff. from HEVELIUS.			Clock-correction.		
h	*m*	*s*		*m*	*s*		*m*	*s*
13	55	27:		.	.	+	6	57:
15	4	0	+	4	45	+	9	0
15	6	40	+	5	40	+	8	40
15	26	22	+	5	6	+	10	22
16	43	21	+	4	52	+	9	21
16	46	5	+	4	51	+	10	5

Rejecting the doubtful altitude, the clock-correction at $15^h\ 49^m$ was $+ 9^m\ 30^s \pm 12^s$, which we shall suppose constant. There may be some suspicion of a gaining rate to the clock, but its effect on the mean of the observations would be small. The results will be:—

Greenwich mean time of immersion of α^1 Libræ . .	$13^h\ 35^m\ 54^s \pm 22^s$
Greenwich mean time of immersion of α^2 Libræ . .	$13^h\ 43^m\ 34^s \pm 20^s$
Greenwich mean time of emersion of α^1 Libræ . .	$14^h\ 51^m\ 34^s \pm 15^s$
Greenwich mean time of emersion of α^2 Libræ . .	$15^h\ 0^m\ 9^s \pm 16^s$.

Page 18.—*Occultatio* ♃, 1679. Junii 5. *manè*. (rose at 15^h 35^m.)

Hor. Amb.		Distantiae & altitudines.		Tempus correct.
		° ′		H. M. S.
1. 18. 55.	Alt. Capitis Andromedae	24. 52. .	. . .	1. 20. 54.
1. 29. 0.	Alt. Arcturi	31. 3. .	. . .	1. 31. 24.
4. 15. 40.	Jupiter stringebat ☾ limbum	. . .	. . .	4. 18. 5.
4. 16. 9.	" ad centrum usque occultabatur . .	. . .	. . .	4. 18. 34.
4. 16. 35.	Jupiter totus omnino tectus	. . .	. . .	4. 19. 0.
5. 14. 0.	Jupiter denus exire votabili particulâ videbatur	. . .	. . .	5. 16. 25.
5. 14. 20.	Dimidius Jupiter exiverat	. . .	. . .	5. 16. 45.
5. 14. 45.	Totus Jupiter omnino prodiit	. . .	. . .	5. 17. 10.
		° ′ ″		
10. 22. 30.	Altitudino Solis	53. 34. 40.	. . .	10. 25. 2.
10. 27. 16.	" "	53. 59. 45.	. . .	29. 42.
10. 30. 8.	" "	54. 14. 0.	. . .	32. 26.
10. 38. 0.	" "	54. 53. 40.	. . .	40. 26.
10. 45. 28.	" "	55. 27. 20.	. . .	47. 46.

Results of the observed altitudes:—

Object.	Mean Time.	Diff. from HEVELIUS.	Clock-correction.
	h *m* *s*	*m* *s*	*m* *s*
a Andromedæ	13 18 50	— 2 4	— 0 5
Arcturus .	13 29 4	— 2 20	+ 0 4
Sun . . .	10 22 44	— 2 18	+ 0 14
" . . .	10 27 9	— 2 33	— 0 7
" . . .	10 30 12	— 2 14	+ 0 4
" . . .	10 37 54	— 2 32	— 0 6
" . . .	10 45 13	— 2 33	— 0 15

The mean clock-correction is -2^s, without any sensible rate. The Greenwich mean times of the observed phases are:—

Immersion.		Emersion.	
Contact of limbs . .	15^h 1^m $2^s \pm 7^s$.	Partly emerged . .	15^h 59^m $22^s \pm 7^s$.
Jupiter half covered .	15^h 1 $31^s \pm 7^s$.	Half emerged . .	15^h 59 $42^s \pm 7^s$.
Jupiter entirely hidden	15^h 1^m $57^s \pm 7^s$.	Entirely emerged .	16^h 0^m $7^s \pm 7^s$.

Page 27.—1679. Junii 24. *vesp. Occultatio duarum stellularum in* ♐.

Hor. amb.		Distantiae & altitudines.	Quo instrumento.	Tempus correct.
h. m. s.		° ′		
10. 39. 55.	Altitudo Arcturi	42. 48.	Quad. p. or.	10. 44. 22.
10. 41. 51.	" "	42. 31.	. . .	10. 46. 32.
11. 0. 8.	Initium occultationis ✱ majoris	. .	. . .	11. 4. 28.
11. 40. 55.	Exitus ejus Stellae in ♐	. .	. . .	11. 45. 15.
12. 11. 48.	Alt. Arcturi	39. 58.	. . .	12. 16. 20.
12. 13. 8.	" "	29. 45.	. . .	12. 17. 49.
12. 17. 25.	Alt. Lucidae Coronae	46. 9.	. . .	12. 21. 42.
12. 19. 19.	" " "	45. 53.	. . .	23. 36.
12. 22. 52.	" " "	45. 23.	. . .	27. 10.
Major illa stella est media illa in praecedente fascia, ♐.				

Results of the observed altitudes:—

Star.	Mean Times.	Diff. from Hevelius.	Clock-correction.
	h m s	*m s*	*m s*
Arcturus	10 45 57	+ 1 35	+ 6 2
"	10 48 5	+ 1 33	+ 6 14
"	12 17 55	+ 1 35	+ 6 7
"	12 19 26	+ 1 37	+ 6 18
α Coronæ	12 22 25	+ 0 43	+ 5 0
"	12 24 19	+ 0 43	+ 5 0
"	12 27 54	+ 0 44	+ 5 2

The difference of more than a minute between the clock-corrections given by the two stars is quite embarrassing, and the more so that Hevelius's calculation makes them nearly agree. The equation of time was $1\ 45^s$, so that the error, whatever it is, seems to be in the computations relating to α Coronæ. The positions which I have adopted for the stars are:—

Arcturus, R. A. $= 14^h\ 1^m\ 4^s$; Decl. $= +20^\circ\ 52'.5$;
α Coronæ, R. A. $= 15^h\ 21^m\ 7^s$; Decl. $= +27^\circ\ 49'.5$.

In the observations of 1663, August 18, the same two stars were observed, and there Hevelius's computations agree with mine. At present, the only course seems to be to reject the altitudes of α Coronæ entirely, and adopt the clock-correction $+6^m\ 10^s$ resulting from the altitudes of Arcturus, which, it will be seen, is only about 10^s greater than that resulting from Hevelius's computations of α Coronæ, when corrected for the equation of time. The results are then:—

Greenwich mean time of immersion of ρ Sagittarii . $9^h\ 51\ 42^s \pm 6^s$
Greenwich mean time of emersion . . . . . . $10^h\ 32^m\ 29^s \pm 6^s$.

Page 110.—*Occultatio Palilicii.* 1681. Jan. 1.

Hor. amb.			
7. 37. 0.	Stella occultata est. alt. capite Androm.	50. 32.	7. 37. 33.
7. 46. 0.	Altitudo Capitis Andromedae . . .	49. 24.	7. 46. 11.
7. 49. 30.	" " "	48. 55.	7. 49. 8.
8. 46. 0.	Palilicium rursus affulsit	. .	8. 44. 0.
8. 51. 0.	Alt. Cap. Androm. extitit	40. 22.	8. 49. 8.

Results of the altitudes:—

Mean Times.	Diff. from HEVELIUS.	Clock-correction.
h m s	*m s*	*m s*
7 42 37	+ 5 4	+ 5 37
7 51 14	+ 5 3	+ 5 14
7 54 53	+ 5 45	+ 5 23
8 55 55	+ 6 47	+ 4 55

Here again there seems to have been an error in HEVELIUS's computations of apparent time. But there is little doubt of the mean clock-correction $+5^m\ 17^s \pm 8^s$; applying which, we have:—

Greenwich mean time of immersion . . . . $6^h\ 27^m\ 41^s \pm 20^s$
Greenwich mean time of emersion . . . . $7^h\ 36^m\ 41^s \pm 17^s$.

Page 139.—*Occultatio Palilicii.* 1683. Jan. 9. *vesp.*

Hor. amb.				
8. 54. 30.	Alt. Pollucis	48. 48.	Quad. p. or.	9. 0. 5.
8. 55. 15.	" "	48. 53.	. .	9. 1. 22.
9. 42. 15.	Initium occultationis	. .	. .	9. 48. 15.
9. 50. 40.	Alt. Reguli	24. 12.	. .	9. 56. 35.
9. 54. 15.	" "	24. 40.	. .	9. 59. 51.
10. 55. 30.	Finis occultationis Pal.	. .	. .	11. 1. 30.
11. 3. 58.	Dist. Pal. ab occ. ☾ limb: 7. rev. .	. .	′ ″ 5. 19.	9. 58.
11. 9. 10.	" " " 10.	. .	7. 36.	15. 10.
11. 13. 20.	" " " 12.	. .	9. 7.	19. 20.
11. 19. 12.	Alt. Reguli	36. 16.	. .	11. 25. 32.
11. 21. 2.	" "	36. 22.	. .	11. 26. 20.
11. 23. 20.	" "	36. 40.	. .	11. 28. 46.

From the altitudes we have :—

Star.	Mean Times.	Diff. from HEVELIUS.	Clock-correction.
	h m s	*m s*	*m s*
Pollux	9 8 14	+ 8 9	+ 13 44
"	9 8 49	+ 7 27	+ 13 34
Regulus	10 4 49	+ 8 14	+ 14 9
"	10 8 4	+ 8 13	+ 13 49
"	11 33 47	+ 8 15	+ 14 35
"	11 34 36	+ 8 16	+ 13 34
"	11 37 3	+ 8 47	+ 13 43

The mean clock-correction is $+13^m\ 53^s \pm 6^s$, which seems to have been constant. We then have:—

Greenwich mean time of immersion . . . . $8^h\ 41^m\ 32^s \pm 8^s$

Greenwich mean time of emersion . . . . $9^h\ 54^m\ 47^s \pm 8^s$.

Page 145.—*Occult. duarum* * *sub cornu aust.* ♉. 1683. apr. 2. *vesp.*

Hor. amb.		Tempus correct.
9. 53. 0.	Initium occul. Stellae Maj. A. 5. mag. .	9. 54. 30.
10. 29. 36.	" " Stellae B. 6. mag. . .	10. 30. 36.
10. 52. 50.	Finis occult. St. A.	10. 53. 50.
11. 43. 30.	Alt. Lyrae . 31.° 25.'	11. 44. 16.
11. 45. 30.	" " . 31. 44.	. 46. 47.
11. 46. 30.	" " . 31. 55.	. 47. 42.
11. 47. 30.	" " . 32. 6.	. 49. 27.

The altitudes of *α* Lyræ give:—

Mean Times.	Diff. from HEVELIUS.	Clock-correction.
h m s	*m s*	*m s*
11 48 17	+ 4 1	+ 4 47
11 50 40	+ 3 53	+ 5 10
11 52 1	+ 4 19	+ 5 31
11 53 22	+ 3 55	+ 5 52

The mean correction is $+5^m\ 20^s \pm 14^s$, which corresponds to the clock-time $11^h\ 46^m$. We have no data for clock-rate; but for several years it has appeared too small to be indicated by such observations as HEVELIUS could make. Applying this correction to the occultations, the Greenwich mean times are:—

Immersion of 119 Tauri . . . . $8^h\ 43^m\ 44^s \pm 24^s$

Immersion of 120 Tauri . . . . $9^h\ 20^m\ 20^s \pm 20^s$

Emersion of 119 Tauri . . . . $9^h\ 43^m\ 34^s \pm 18^s$.

§ 10.

OBSERVATIONS OF ECLIPSES AND OCCULTATIONS MADE BY ASTRONOMERS OF THE FRENCH SCHOOL BETWEEN 1670 AND 1750, AS FOUND IN THE MANUSCRIPT RECORDS OF THE PARIS AND THE PULKOWA OBSERVATORIES.

We now pass to a class of observations much more satisfactory than those with which we have been dealing. In the latter part of the seventeenth century, PICARD and other French astronomers introduced the improved method of determining the time by equal altitudes of the sun, of which I have already spoken.* Their clocks were so far improved that their principal changes of rate were those due to changes of temperature. I include in the present section all the observations for which the time was determined on this plan, including those of DELISLE in St. Petersburg. They are for the most part unpublished. The results of a few have indeed appeared in the old Memoirs of the French Academy, and in the *Philosophical Transactions*, but these are not by any means the most valuable ones for our present purpose. Besides, they were reduced with the imperfect data of the time, and need a more careful reduction before the best results can be obtained from them. As an example of the danger of trusting to the old reductions, it may be remarked that occultations were often observed by CASSINI with a different clock from that used for observing the meridian observations of the sun. But in communicating the result of one of these observations to the Academy, he failed to correct it for the difference of clocks, so that it appears printed in the Memoirs more than a minute in error.

Four occultations of the Pleiades, observed by DELISLE at St. Petersburg, were reduced by LINSSER, of the Pulkowa Observatory, and published in the Memoirs of the St. Petersburg Academy.† But observations of occultations were made by DELISLE during a large part of his stay at St. Petersburg, which are to be included in any complete discussion of the subject

In March, 1871, the late M. DELAUNAY, then director of the Paris Observatory, very kindly placed the whole of its older archives at my disposal, with unrestricted permission to extract from them, and use in my investigations, whatever I might find of value for the work in hand. Two years later a similar permission to complete my copies in certain points was granted by M. LE VERRIER. As a result of this permission, I am enabled to present the observations discussed in the present section.

Of the records to be used, a large portion were evidently never intended to be understood or used by any one but the observers. For the most part, the note-books contained no titles, no indications of the observer, no verbal statement of the observation, and no name or indication of instruments, except in the case of clocks. All information on these points had to be gained by comparison and induction. It was found that a certain arrangement of figures, which the reader soon learned to recognize, showed observations of equal altitudes of the sun before and after noon, and that the signs |(and)| indicated the transits of the two limbs of the sun over the meridian of some instrument. Each observer seems to have had his own instruments, which he used without any reference to or comparison with the instruments of others.* In many cases, especially among the earlier observations, no designation of the occulted star by which it might be identified was given. In these cases, it was necessary to compute the tabular place of the moon, as affected by parallax, for the time and place of the occultation, and then to ascertain from the modern catalogues or star-maps what stars were then near contact with the limb of the moon. I believe this operation, though laborious, was always successful, except in a few cases of stars too faint to be found in catalogues.

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* See *ante*, pp. 23–24.

† *Vier von De l'Isle beobachtete Plejaden-Bedeckungen, bearbeitet und mit* HANSEN'S *Mondtafeln verglichen, von* CARL LINSSER. St. Petersburg, 1864.

In the following pages, the intention is to present literal copies of extracts from the original records It is not, however, always practicable to do this with entire rigor. In the case of some observers, especially of DELISLE, the observations were given at such length, and mixed with so many extended remarks, that a condensed summary was absolutely necessary. These summaries can always be distinguished from verbatim copies by being written in English. In printing the following discussion of the observations, a sharp distinction is made between two classes of matter, namely, (1) remarks made at the time of examining the original observations, while the writer was in entire ignorance of the nature of the results; and (2) the ulterior reductions, made when the original records were no longer accessible. The former, as well as the literal copies from the records, are distinguished by being printed in smaller type, so that the reader can readily distinguish them from the latter. The arrangement is made on the following plan:—The observations are divided into four series, each of which are made by one set of observers, or on a common plan, or with the same instruments. Perhaps it would be more accurate to say that the different series correspond to different sets of volumes found among the archives of the Paris Observatory; certainly, this is the only real distinction I can now make between series I and series IV. Preceding each series is given such general discussion of the observations as applies to the whole of it. Each series is divided into groups, each group comprehending such observations as could be conveniently discussed together, and the reduction and discussion of the observations of each group are given immediately after the observations which belong to it. In the case of series IV, however, all the earlier observations are made and reduced on a plan so nearly uniform that it has not been deemed necessary to go into the separate details of reduction of each observation.

It may happen that in some cases the relation of the observations to each other, and the bearing of the remarks on them, will not be clear. This is owing to several disadvantageous circumstances. Some of the archives examined were misarranged through mistakes of the cataloguer; the copies were made during the reign of the Commune and the siege of Paris by the national forces, and were therefore somewhat hurried; in reading proof, no access to the originals could be had. These circumstances are the only apology I can present for any crudity of arrangement which may be noticed.

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* In this connection, it may not be amiss to call attention to the wide-spread error, found even in French histories of astronomy, that CASSINI I. was director of the Paris Observatory. In fact, this establishment was assigned to the common use of the astronomers of the Academy of Sciences, and no such office as that of director was known or recognized. The celebrity of CASSINI seems to have given rise to the unfounded impression that he exercised a supervision over the work of the other astronomers.

Examination of Manuscripts at the Paris Observatory.

SERIES I.

There are curious duplicate copies of the earlier observations at Paris. (1) We have a volume entitled *Histoire Céleste de l'Observatoire Royal de Paris*, vol. 1, 1671–1675. But vol. 2, with the same title, does not begin until 1783, and the similarity of the volumes following 2 to volume 1 seems to show that they were not prepared until a comparatively late date.

(2) There is another volume, entitled *Fragmens des Relevés des Registres de l'Observatoire Royal de Paris*, in which the observations of 1672, 1673, 1680–1684, 1700–1703, 1760–1767, are copied on printed forms, with the heading *Histoire Céleste de l'Observatoire Royal de Paris*, which was prepared by CASSINI IV. for publication, but never published.

These two volumes seem to be in the same handwriting, namely that of CASSINI IV. Yet, while much of the matter in the two is common, each contains observations and remarks not given in the other. For instance, in the case of the occultations of February 3, 1672, (2) says that the clock stopped about 5¼ hours p. m., and that it stopped very frequently about this period. There is no complaint of the clock at all in (1). Yet the observations agree perfectly. But of the altitudes for time copied from (1) only a very few are found in (2). More curious yet is the comparison of the accounts of an occultation in 1672 given in the two registers, which I copy verbatim.

From (1), page 32.—" Le 2 Aoust. Vers les 9^h. du soir la lune etoit proche d'une etoile fixe voisine d'Antarés qu'elle a eclypsée au moment de l'immersion (qu'on a oublié de marquer sur le registre) la distance ou la differ. de declin. du bord austral de la lune et de l'etoile etoit de 1′ 3″."

From (2), p. 42.—"Aoust le 2. Vers les 9^h. du soir, la lune s'approchoit d'une etoile voisine du coeur du Scorpion que l'on a jugé devoit être eclypsée. Le parallelle de l'etoile parait quelques minutes au midi de la tache de Copernic.

" 10^h. 21′. 34″. Occultation de l'etoile par la lune (10^h. 22′. 11″. T. vr.)"

We find also that in (2) the use of the astronomical day is introduced, instead of the old divisions " matin ", " soir", and we have the following clock-errors and transits:—

Aug. 2.	8^h	22′	0″	Pend. retard		0′	35″
	12	17	5	β versau au merid.	34°	12′	55″
	14	44	0	Mars " "	32	57	30
	15	13	0	Saturn " "	39	37	40
3.	9	56	0	Pend. retard		0′	42″
	10	35	0	α Aquilae.			

[In (1), 10^h 34′ 40″ is given for the time of transit of α Aquilae.]

But there is no indication how these clock-errors were obtained, and no observations in either book to fix clock-errors at these times.

I infer from this, and also from remarks of CASSINI, that both volumes are simply excerpts from registers which cannot now be found, and that the observations of different persons are mixed together.

The clock-error would seem from what follows to be well determined, unless the instruments for determining it were erroneous. But the times of transits which follow do not agree with this error at all. In fact, we have from the transits of β Aquarii and α Aquilæ :—

	1672, Aug. 2. h m s	Aug. 3. h m s
Right ascension of star	21 14 17	19 34 48
Mean time of transit	12 24 58	10 41 50
Apparent times	12 19 27	10 36 24
Clock-times	12 17 5	10 35 0
Clock apparently slow	2 22	1 24.

Either the meridian instrument was defective, and not used for clock-error, or observations with two clocks are mixed together. As the method of equal altitudes was known and practised at this time, I think we may take the clock-correction given as probably near the truth, so that we shall have :—

	h m s
Apparent time of an occultation of τ Scorpii, 1672, Aug. 2	10 22 11.
Equation of time	5 31.6
Paris mean time	10 27 42.6
Greenwich mean time	10 18 21.6.

In view of a certain probability that the clock-error was well determined, the probable error of this time may be estimated at ± 6^s; but the probability of the error being four times as large as this is much greater than would result from the application of the usual theory of errors to the supposed probable error.

From (2).—1680, April 4. 10^h 25′ 7″. Occultation d'une etoile par la lune.

Midy le 2.	11^h	59′	36″ à la ligne.
3.	0	0	15
4.	11	59	55
6.	0	0	16.

We can only use this as apparent time. The discordant meridian transits of the sun which follow do not indicate any readily determined correction of the clock on apparent time. The equation of time being + 2^m 36^s, we have:—

Paris mean time of occultation of Lalande 12148 . .	10^h 27^m 43^s
Greenwich	10^h 18^m 22^s.

The probable error may be ± 12^s. The extraordinary coincidence between the mean times of this and the last occultation seems to be accidental.

On 1682, Feb. 15, we find the occultations of the Hyades recorded as follows :—

$\left.\begin{matrix}6 & 59 & 2\\ 7 & 1 & 27\end{matrix}\right\}$ Occultation des deux etoiles qu'on a observées après la lune.

The times are marked in the column "Temps vray", which, however, contains elsewhere only clock-corrections. Preceding it we have a set of corresponding altitudes of ⊙ for clock, evidently independent of those of LA HIRE, hereafter quoted, and giving a clock-correction of −24^s.3, nearly half a minute different from the correction of LA HIRE's clock. Yet the occultation must be that observed by LA HIRE [given hereafter].

For this date we have + $14^m\ 41^s$ for the equation of time. This would make the mean times of the occultations, as reduced by the unknown computer:—

	h	m	s
θ_1 Tauri	7	13	43
θ_2 Tauri	7	16	8

which are 9^s less than those which we shall find to be given by LA HIRE's observations. This, then, may be regarded as the error of reduction in the present case.

Observations by CASSINI *and* MARALDI.

There is a series of registers, in small quarto, for the years 1683 onward, without original title or paging, containing rough notes of observations.* The only title is *Observations du Soleil et des Etoiles faites en Boulogne et en Paris l'an* 1683, *et continuées à Paris la même année et la suivante.* No mention of the observer, but there is little doubt that it was J. D. CASSINI.

EXTRACTS.

1683. *Occultation of γ Tauri, Feb.* 5.

Feb. 4. Hauteurs Rigel.	5 8 13	23 0 0
	12 47	23 30 0
	17 26	24 0 0.

Feb. 5 (probably a. m.).

9 16 53 h. inf. bord ♀	24 2 0	0 0 57	midy a la m. A.
22 9	24 30 10	0 0 58	" a la m. B.
26 35	25 0 0		

2 9 37½	1 *b* ♀	24° 30′ 0″
9 46	2 *b*	
14 17		24 0 0
14 26		
18 51½		23 30 0
19 1		
23 19½		23 0 0
23 28½		
27 44		22 30 0
27 52½		
32 3		22 0 0
32 12½		
36 17		21 30 0
36 26½		

Feb. 5 (probably a. m.). Hauteurs lepy delav.

6 18 29	23 30 0
23 6½	23 0 0
27 53	22 30 0
32 12½	32 0 0
7 5 33½	18 0 0
9 35½	17 30 0
17 20	16 29 15

P. M. Hauteurs Rigel.

5 13 19	23 59 0
5 18 16	24 31 0
10 4 32½	24 31 5
9 37	23 59 0

7 41 26 Rigel au merid. par les h. corres.

$12^h\ 0'\ 8''$, occultation de l'etoile qui est a la point de l'angle du Hyades par la lune.

1683. Feb. 6.

0 1 9 midy a la m. *a*.
0 1 10 " " " *b*.

We shall derive the clock-correction from the meridian transit of Rigel, as

---

[*] This is really the regular series of the records of the Observatory, and is continued until 1795; but a part of it has been copied into another series, which I have sometimes used to copy from, and the cataloguer has confused the original with the copy

deduced from the equal altitudes, and the rate from transits of the sun over the two meridian-marks on February 5 and 6. We have:—

	h	m	s
Mean R. A. of Rigel, 1683.1	4	59	20.1
Sid. time of mean noon, 1683, Feb. 5, Paris	21	2	52.2
Mean time of transit of Rigel thence computed	7	55	9.9
Correction of clock on mean time,	+	13	44.1
Mean time of transit of sun, Feb. 5, 0^h 14^m $42^s.3$; Feb. 6,	0	14	45.8
Correction of clock (mean of marks) + 13 44.8	0	13	36.3
Correction of clock for occultation of γ Tauri	+	13	42.6
Paris mean time	12	13	50.6
Greenwich mean time	12	4	29.6.

Eclipse of July 12, 1684.

Le 12 Julliet, a 6^h. Therm. 79½. Bar. 28.0.

Haut. du bord sup. du ⊙

6	24	50	20	40
	27	57	21	10
	31	2	21	40
9	2	26	46	10 (?)
	5	51	46	30
9	23	39	49	20

Après midy on a avancé l'horloge de 16″. L'Eclipse. À 2 28 30 Elle etoit commencée, fin 4 43 12. L'horloge de M. de la HIRE avancoit sur le notre 5′ 57″. Il a observé la fin a son horloge a 4^h 49′ 9″.

But there is some doubt as to which clock the writer used.

4^h 42′ 56″ horloge de la tour occidentale = 4 45 0 horl. de la tour orientale. D = 2′ 4″.

1684. Le 13 Juillet. Hauteurs du bord sup. du ⊙

10	9	55	55°	30′	8″	1	49	13½
	12	33	55	50	8	1	46	32
	18	10½	56	30	0	1	40	59
	21	2	56	50	0	1	38	7
	23	57	57	10	12	1	35	12
	26	54½	57	30	12	1	32	13
	33	2	58	10	0	1	26	5

I make no use of these observations of the eclipse. The beginning appears not to have been seen. The coincidence of the time of ending with that derived from the observation of LA HIRE renders it doubtful whether the end was actually observed either. The results of these and other observations are given in the *Mémoires*, tome x, p. 667, where CASSINI's time of beginning is said to be 2^h 25^m 55^s, and of end 4^h 43^m 23^s. Either the same clock-error has not been used at beginning and end, or the time of beginning is in some way altered.

1684 le 19 Decembre. Hauteurs du bord sup. du Soleil.

9	28	10	2	35	32	10	20	0
9	35	23	2	28	22	11	0	0
12	0	31	1 Bord ⊙					
12	2	54	2 " "					
	2	23						
12	1	34	Midy a la Marque Q					
12	2	3	Midy a la Marque D contre la Muraille.					
12	1	51½	Midy par les corresp.					

À 2^h 40 l'horloge orientale avance 47″ sur l'occ. J'ay osté deux minutes a l'horloge occidentale et j'ay mis avec elle l'orientale.

Le 20 Decembre.

11 58 50	1 Bord ⊙	9 59 18	2 0 42 *a*	13 10 0
12 1 12½	2 "	10 1 28	1 58 35 *b*	13 20 0
		10 3 38	1 56 28	13 30 0
2 22½				
11 59 50	Midy par l'omb.			
12 0 22	a la Marque D.			

I judge that the following are altitudes of the sun observed on the morning of the 21st, with a mistake in the hour, 2 being written for 9. There is a blank space left for the corresponding afternoon altitudes.

	2 32 4	10 50 0
	33 55	11 0 10
	35 52	11 10 30
	29 26	11 30
A midy nebuleux	43 20	11 50 10
	47 13	12 10 0
	51 15	12 30 10

Le 21 Decembre.

Commencement de l'eclipse 9^h 29′ 8″.
18

35′ 6″ L'Etoile se cache derriere la lune.
— 18 [Evidently a subsequent insertion.]
10^h 8′ 58″ L'Etoile paroist. [Under this another time is given for the same phenomenon, apparently 9′ 10″, but it is erased with the pen, and 8′ 58″ is substituted.]

Le 22 Decembre.

12 0 11	I Bord ⊙	9 14 46	9 10 0
12 2 34	II "	18 5 douteuse.	9 30 0 douteuse.
12 0 42	Midy a la Marque D.	9 21 31	9 50 0
		24 57½	10 10 0
		28 30	10 30 0
		32 6	10 50 0

à 10^h l'hor. oriental avance sur l'occ. 5″.

Le 23 Decembre.

Noon per single pair of altitudes, 12^h 0^m 30^s.

Le 24 Decembre.

12 0 55	1 Bord du ⊙	9 14 52	2 46 54	9 10 0
12 3 15½	2 " " "	18 11	2 43 34	9 30 0
12 0 34	Midy a la Marque Q	21 37	2 40 8	9 50 0
12 1 16	Midy non pass. a la Marque D	25 13	2 36 32	10 10 0
		28 36	2 33 11	10 30 0
		32 12	2 29 36	10 50

These observations from 1684, December 19 to December 24, are given here for the purpose of reducing the occultation of μ Geminorum, observed during an eclipse of the moon, on the evening of December 21. The same occultation was observed by LA HIRE, with a much more certain determination of clock-error; but I have thought it worth while to reduce these observations also, although there has been some difficulty in unravelling them, owing to the three meridian-marks or instruments on which the sun-transit was observed, and the general confusion of the records. The mode of proceeding has been as follows:—From the equal altitudes of the sun on December 20 and December 24 the index-error of the quadrant was derived. Taking this index-error for the altitudes observed on December 21 and December 22 (a. m. civil time), the sun's hour-angle was computed for each of these observations. The clock-corrections thus deduced from the altitudes alone, reduced to noon, were:—

Date.	Corr. on Apparent Time.	Equation T.	Corr. on Mean Time.
1684.	s	m s	s
Dec. 19	+ 8.0	− 1 40.7	− 92.7
20	− 1.5	− 1 10.5	− 72.0
21	− 17.0	− 0 40.4	− 57.4
22	− 24.0	− 0 10.2	− 34.2
23	− 30.0	+ 0 20.0	− 10.0
24	− 50.8	+ 0 50.1	− 0.7

The correction of the clock for the phases of the occultation appears to be —$48^s.2$ and —$47^s.3$, with a probable error of perhaps 3^s. There is no certain evidence that the clock used was the same with that with which the altitudes were noted, but the close coincidence between the figures, — 18, written under the observed seconds of immersion, and the correction of the clock on apparent time, make it probable that the clocks were the same. The correction — 18^s is that actually applied by CASSINI, as appears from the publication of his result in the Memoirs of the Academy, vol. x, p. 674. The time there given is $9^h\ 34^m\ 48^s$.

The emersion is to be received with suspicion owing to the double record, and the possibility that the observer did not catch the star when it first emerged.

1686, Apr. 10. Occultation of Jupiter observed, but no sufficient data for clock-correction.

Occultation of unknown star, 1686, June 25, $9^h\ 53'\ 51''$ p. m. clock.

June 24, ☉ altitudes.
10 31 0   59 20 0   59 33 0 50 midy.
33 54   59 40 0   1 54
37 0   60 0 0
June 25. 0 53 midy. 9 53 51 une fixe dans la parte obscure ☽.
June 26. haut. du bord du soleil.
9 34 11   52 0   11 58 48 2 18
9 37 48   52 30   1 6
9 41 7   52 59
44 49   53 30
48 23   54 0 5 cette derniere seule est bonne.
June 27. 11 58 54 |(
0 0 3 | centre (?).
June 28. $9^h\ 33'\ 43''$ $51^\circ\ 50'\ 10''$ $2^h\ 26'\ 26''$
37 10   52 20 10   2 22 49
June 29. 11 59 3 |(
0 1 21)|

The clock-times of apparent noon, as they follow from the meridian-mark and from the altitudes, are as follows:—

	Mark.	Altitudes (corrected for rate).
June 24	$0^h\ 0^m\ 43^s.5$	$0^h\ 0^m\ 38^s.5$
25	$0^h\ 0^m\ 53^s$:	
26	$11^h\ 59^m\ 57^s$.	$11^h\ 59^m\ 53^s$
27	$0^h\ 0^m\ 3^s$:	
28		$0^h\ 0^m\ 3^s.5$.
29	$0^h\ 0^m\ 12^s$.	

The clock appears to have been put back a minute on June 25, and there is no way of determining whether it was done before or after the occultation. The correction on apparent time at $9^h.9$ was either $-\ 51^s$ or $+\ 9^s$. The equation of time is $+\ 2^m.2^s$. We have therefore:—

Correction of clock on mean time	$+\ 1^m\ 11^s$	or	$+\ 2^m\ 11^s$
Paris mean time of occultation .	$9^h\ 55^m\ 2^s$	or	$9^h\ 56^m\ 2^s$
Greenwich mean time	$9^h\ 45^m\ 41^s$	or	$9^h\ 46^m\ 41^s$.

The star is B. A. C. 3579.

1686. 1 Juillet. 11 59 16½ |(
1 35)|
0 25 l'ombre a midy.

Juillet 2. 11 59 19 |(
0 26 a l'ombre.
1 36)|

L'horloge occ. retard 1″.

9 19 57 une etoile entre dans lune.
9 37 10 elle s'est sortie.
36 0 elle estoit sortie.

Following this are observations rather difficult to understand, from which it is concluded that midnight on the 2d was at $0^h\ 0^m\ 28^s$; and on the 3d, midy was $0^h\ 0^m\ 34^s\frac{1}{2}$.

Using the correction of the meridian from the observations of June, we have:—

Transit of ⊙, July 1, clock .	$0^h\ 0^m\ 21^s.0$;	mean time $0^h\ 3^m\ 9^s.7$.
Transit of ⊙, July 2, clock .	$0^h\ 0^m\ 22^s.3$;	mean time $0^h\ 3^m\ 21^s.2$.
CASSINI finds, July 2.5 . . .	$12^h\ 0^m\ 28^s$;	mean time $12^h\ 3^m\ 26^s.7$.
CASSINI finds, July 3.0 . . .	$0^h\ 0^m\ 34^s.5$;	mean time $0^h\ 3^m\ 32^s.2$.

The clock-correction on mean time seems pretty well determined, and equal to $+2^m\ 59^s$. It seems possible that the clock used was the "horloge occidental", one second slower than the other; but the correction will still be less than $3^m\ 0^s$. We have, therefore:—

Paris mean time of immersion of B. A. C. 5395 (?) . .	$9^h\ 22^m\ 56^s$
Greenwich mean time of immersion of B. A. C. 5395 (?) .	$9^h\ 13^m\ 35^s$.

I shall not attempt to use the emersion.

1689. Mai 18.	53 9	|(				
	55 25	)|				
	57 23	)| a l'oct.				
Mai 21.	52 59	|(				
	53 15	)| This time is probably 2^{m} early.				
	9 6 29	l'epy de la ♍ au verticale 31 40 30.				
	9 37 2	Imm. d'une etoile de ♊ pres de grimaldi.				
	9 59 29½	♄ passe par le vert. du. (?)				
Mai 22.	52 52	|(11 54 0½ midy.				
	55 9	)|				
	55 40	le dernier bord du ⊙ au vert. de l'octant.				
	9 2 31	l'epi au vertical.				
	9 54 53	arcturus passe par le vert. du quad.				
Mai 24.	9 30 42		49 30	30 14	59 46	
	33 1		49 50	27 53	1 4	)| au V.
	35 21		50 10	25 33	2 16	
	9 0 28	l'epy au merid.				
	9 52 46	arcturus au vert.				

Notes on the preceding observations, especially the last:—It is hard to say with certainty what instruments the transit of the sun was observed with. By induction, however, I conclude that the signs |(and)| meant transits of the suns's limbs over the meridian of the octant. But from the observations of May 21, it would seem that this could not have been the case May 22.

The following, however, are transits of ⊙ centre over something, and times of apparent noon from corresponding altitudes:—

		)| |(	Oct.	Quad.	Corresp. alt.
1689.	Mai 15.	$11^{h}\ 54'\ 8\frac{1}{2}''$	$56^{m}\ 6^{s}$		11 54 37
	16.			54 11	
	17.			54 13	
	18.	11 54 17	56 15		
	21.	11 54 7			
	22.	11 54 0½	54 32		
	23.	11 53 56	54 29		
Clock adv. 6^{m}.	24.	59 56 (?)			0 0 20
	25.	11 59 54½	0 23		
	26.				0 0 24:

The following are the altitudes of the sun for time:—

May 15.				May 23.	
a. m.		p. m.		a. m.	
$9^{h}\ 54'\ 50''$	$52^{\circ}\ 0'$	1 54 41	52 4	9 22 13	49 0
57 34	52 20	52 4		24 33	49 20
10 2 58	53 0	46 36		26 53	49 40
5 47	53 20	43 45		29 15	50 0
8 37	53 40	40 55		31 36	50 20

The reduction of these observations has proved troublesome, but I think a pretty certain result may be reached. We have altitudes, singly or in pairs, on the civil dates May 15, 23, 24, and 26. From a separate reduction of the pairs of altitudes, the index-error of the altitude instrument seems to be only 0′.1. The clock-times of apparent noon are thus found to be as in the following table. Comparing them with the times)|, |(, we have the three corrections of the latter:—

Date.	Noon from Alts.			)| and |(.			Corr.	Mean Time.			Clock-correction.	
	h	*m*	*s*	*h*	*m*	*s*	*s*	*h*	*m*	*s*	*m*	*s*
May 15	11	54	37	11	54	8.5	+ 28.5	11	55	50	+ 1	13
21	.	.	.	11	54	7.	. .	11	56	3	1	31
22	.	.	.	11	54	0.5	. .	11	56	7	1	41
23	11	54	18	11	53	56.	+ 22.	11	56	12	+ 1	54
24	0	0	21	11	59	56. :	+ 25. :	11	56	17	− 4	4

The mean correction to the principal noon-mark being $+ 25^{s}$, this quantity is applied to the clock-times of the transits of the sun on the 21st and 22d to obtain the clock-times of apparent noon. The clock-correction for the time of the occultation being $+ 1^{m}\ 35^{s}$, we have:—

Paris mean time of occultation of WEISSE II, 1656 (?) . $9^{h}\ 38^{m}\ 37^{s} \pm 3^{s}$
Greenwich mean time of occultation of WEISSE II, 1656 (?) $9^{h}\ 29^{m}\ 16^{s}$.

Occultations of 1690, Apr. 13 and July 3.

1690. Apr. 13. $11^{h}\ 37'\ 52''$ j'ay vu entre la fixe derriere le disque de la Lune par la lunette de 34 p.

The data for clock-corrections are:—

	|(			)|	
	h.	′	″	′	″
1690. Mar. 24	11	57	48	59	58
25		58	23	0	32
27		57	33	59	41
29		56	21	58	30
30		56	13	58	22
Clock adv. 3′. Apr. 2		59	7	1	17
3		58	48* (?)	—	—
5		58	13	0	23
6		57	56	0	6
7		58	3	0	13
8		57	34½	59	44
9		57	10	—	—
10		56	43	58	53

Corresponding altitudes ⊙.

Mar. 24.							
h.	′	″	h.	′	″	°	′
10	3	22	1	55	19	37	0
	6	42		51	58½	37	20
	10	10		48	31	37	40
April 5.							
9	38	33	2	20	2	38	30
	42	21		17	14	38	50
	45	13		14	22	39	20
	49	32		10	1	39	40
	52	29½		7	3½	40	0

April 24.

⊙ per corresponding altitudes without correction . . $58^{m}\ 45^{s}$
Interval . . . . . . $5^{h}\ 45^{m}$
|(—)| Apr. 23 . . . 11 57 14
25 . . . 11 57 25

---

* In this and the following observations, it is stated distinctly that the transits are over the vertical of the great quadrant.

Clock adv. 3′. Apr 12		59 6	— —
13		58 40	0 51
15		57 55	0 6
June 11	11	57 41	59 58
13		57 45 (sic)	59 3
14		58 25½[1]	60 44
15		58 22½	0 41
16		58 21	0 39
July 1	11	59 14	1 30
2		— —	1 28
3		— —	1 31
4	11	59 18	1 35

3 Juillet 3 5 25 une fixe des Pleyades entre dans la lune.

So on Apr. 24 the correction was about $+17^s$.

June 13.

h. m. ″	h. ′ ″	° ′
9 50 56	2 8 4	54 20
53 19	5 42	54 40
57 4	1 57	55 20
59 36	59 25	55 30
10 2 6	— —	55 50

June 16.

h. ′ ″	h. ′ ″	° ′
9 22 22½	2 36 48	50 20
24 36	34 32	40
26 52	32 15½	51 0
29 8½	29 58	20
31 25	27 40	40

July 1.

9 27 56	2 32 50	50 50
30 12½		51 10
32 30		51 30
34 47		51 50
37 4		52 10

We have first to find the corrections of the quadrant from the corresponding altitudes. The results are as follows:—

Date.	Noon, from Quadrant.	From Altitudes.	Corr of Quad.
	h *m* *s*	*m* *s*	*s*
1690, Mar. 24	11 58 53.	59 3.0	+ 10.0
Apr. 5	59 18.	59 30.8	+ 12.8
Apr. 24	57 19.5	58 31.3	+ 71.8
June 13	58 54.:	59 28.6	+ 34.6
June 16	59 30.	59 32.5	+ 2.5
July 1	60 22.	60 25.1	+ 3.1

We here meet the perplexing question whether these great changes in the position of the quadrant are real, or whether they arise from an accidental error of a minute in the record of April 24, and half a minute in that of June 13. There is clearly an error of one minute in one of the records of transit of the sun's limb on the latter date: I have assumed the error to be in the second limb. But no change in the minutes alone will reconcile the correction with the two following ones. For April 24 I have copied nothing from the original record; the transit of the sun over the quadrant was not observed, but is deduced from those of the days preceding and following. For the corresponding altitudes I took the mean of the actually observed times with the mean interval, the latter being required to compute the correction due to the change in the sun's declination. The remark about the correction being $+17^s$

---

(1) J'avais replacé le grand Q. auparavant l'observation.

I am now quite unable to understand. I have assumed the correction of the quadrant to be +12ˢ on April 13 and +3ˢ on July 3–4. Then, we have:—

Date.	Clock-time of Noon.	Mean Time.	Clock-correction.
	h m s	h m s	m s
1690, Apr. 13	11 59 57	0 0 18	+ 0 21
Apr. 15	11 59 12	11 59 47	+ 0 35
July 2	0 0 23	0 3 22	+ 2 59
July 3	0 0 26	0 3 33	+ 3 7
July 4	0 0 29	0 3 44	+ 3 15

We thus deduce:—

	April 13.	July 2.
Clock-corrections at time of occultation .	+ 24ˢ	+ 3ᵐ 4ˢ
Paris mean times	11ʰ 38ᵐ 16ˢ	15ʰ 8ᵐ 29ˢ
Greenwich mean times	11ʰ 28ᵐ 55ˢ	14ʰ 59ᵐ 8ˢ.

The stars are supposed to be 136 Tauri and 27 Tauri.

Assuming the quadrant to have been steady, the probable errors of these times do not exceed two or three seconds. If, however, the corrections to the quadrant on April 24 and June 13 were real, and the instrument correspondingly unsteady, the times may be in error by twenty seconds or more, and are probably too great.

Occultation of Aldebaran, 1699, *Aug.* 18.

Aug. 19, A. M.	1 38 44	l'etoile touche.
	1 39 22	l'etoile entre.
	2 17 12	l'etoile sorte de la lune et paruit grosse.

A correction of 1ᵐ 6ˢ is then applied for clock-error; but it is not possible to tell how it was obtained, and the confusion of the observations and of the two clocks is such that the independent computation of a clock-correction is not possible. Here, as in the observations of 1684, we find comparisons between a "horloge orientale" and "horloge occidentale", but no indication as to the clock with which any particular observation was made.

In examining the observations 1686–1690, I find no indication that more than one clock was used.

The last volume of the series from which the preceding observations are copied, viz, vol. 19, is in a much nicer handwriting, and is evidently not a simple record of observations, but a mixture of observation and calculated results. An occultation of Aldebaran was observed 1701, February 16, but it is hard to tell what is meant.

The duplicate series is bound in vellum, and is evidently a simple copy of the preceding in a fairer handwriting. As the copy seemed to be quite correct, and to include everything, I have sometimes employed it to copy from, nearly always, however, comparing with the original as I went along. This series is numbered 1009, and is bound in vellum. Vol. 1 is missing; at least, I could not find it. Vol. 2 commences with 1682, January 1, but has no title whatever. On the inside of the cover of each volume is a rude index to the principal observations. The series continues without interruption to 1795, but a number of volumes are missing.

From the last described series, vol. 9.

Eclipse of 1724, May 22 ?

Observations faites par **Sarel** (?) dans tour inferieure occidentale.

5	55	24	com. decl.
6	49	10	Totale.
	51	52	recouv. de lum.
	57	40	On ne vcit plus le soleil.
7	39	0	pend. sup.
7	39	26	pend. inf.

Observation faite par M. **des Places** avec une lunette de 34 pieds par le moyen de l'image du soleil que se peignoit sur un papier . . . . avec une montre de poche mis sur l'heure de la pendule a demie second.

	5	56	0	comm. par estimation.
(sic)	6	48	20	Totale.
(sic)		51	5	recouvr. de lumière.

Imm. dans l'ombre 2^{m} 35 sec. (sic). Cette eclipse a été observée a Trianon.

A l'observatoire par M. **Gaudin**.

5	55	16	comm.
6	48	51	Immersion.
	51	13	recouv. de lumière.

A Trianon en presence du Roy.

5	54	50	commencement de l'eclipse.
	48	24	eclipse total qui arriva dans un instant.
	50	40	recouvr. de lumière qui parut comme un eclair. la pendule avancé

de 20″ et Versailles est plus occidentale que paris de 52″ et trianon est encore a l'occid. de quelques secs.

All this is a literal copy from the record.

The transits of the sun were as follows :—

		|(			)|		
Mai 21	11	56	28		58	44	3′ adv. à la pend. superieur.
22		59	22½	Douteux.	1	39	Bon.
23		59	15	a peu pres.	1	36	
24		59	23		1	37	
25		59	19		1	35	
26		59	19		1	31	

There are no altitudes till December 30, and then, it would appear, only because something had happened to the quadrant.

From this point onward, the observations are made and recorded too carelessly to be of any use.

Eclipse of 1715, May 2.8.

	3 May.	6^{h}	51′	0″	pend. sup.	
		6	50′	54″	pend. inf.	
ad. 14″		8	13	0	comm. de l'Eclipse. lunette de 8 pieds, pend. inf. et lunette de 34 pieds.	
		8	27	30		3 Doits
			37	20		5 d. ½
			41	30		6
			45	50		10 d. ½ (sic)
		9	18	15		11¼
			20	12		11
			40	50		11
			53	0		6
		10	11	30		4

17 16 3
23 0 1
28 30 Fin observeé a lunette de 8 pieds.
12 33 0 pend. sup.
32 55 pend. inf.

Observation faite a Marly. (Record in the same hand, and that a good one.)

Le 2. May a 9^h $14'$ $6''$ H. d. Arcturus 51 40
9 19 10 52 20
Le 3. May a 6 40 52 H. du ⊙ 18 30
a 8 11 32 Commencement vu avec une lunette de 8 pieds.
8 16 10 Un doit. Le pendule a avancé de $30''$ qu'il faut retrancher de [toutes les observations.
20 58 2
26 49 3
29 54 4
33 0 Quatre doits
38 7 Cinq.

[Omitted copying the rest of the observations. They are found printed in the Memoirs for 1715.]

10^h $28'$ $20''$ Fin, que l'autres personnes ont jugeés a 10^h $28'$ $0''$
10 34 59 H. du ⊙ 52 40.

Le Roy a assisté aux observations qui se sont faites vers le milieu et a la fin aussy bien que M. le Duc d'Orleans et toute la cour qui y . . . pendant presque toute la dureé de l'Eclipse.

At the end of the volume is given the calculation of clock-error from the four observed altitudes. A. R. Arcturus, $210^\circ\ 42'\ 35''$; of ⊙ at noon, $38^\circ\ 55'\ 33''$; at time of observation, $39^\circ\ 17'\ 36''$. Altitude, $51^\circ\ 40'\ 0'' - 48'' = 51^\circ\ 39'\ 12''$; $\varphi = 90^\circ - 41^\circ\ 8'\ 25''$; $H = 32^\circ\ 38'\ 24''$ &. 31 22 54; set. deh $0'\ 57''$ (?) 0 $58''$ (?).

J'ay avancé la pend. d'une minute.

Next morning clock-errors $-37''$ & $-28''$. N. P. D. Arcturus $69^\circ\ 19'\ 8''$.

There is no clue to the place where or the person by whom the first of the above set of observations was made, except the clock-error, which agrees with one determined at the Paris Observatory. The second set, made at Marly (now Marly-le-Roi), agrees, so far as I copied it, with the printed observations in the *Mémoires* The presence of the monarch probably exerted a very injurious effect on the observations, and I have been in some doubt whether they are worth using.

For clock-correction at Paris.

1715. May 1. A. M. 8 5 16 pen. inf. = 8 11 0 pen. sup., Diff. $5'\ 44''$.
1 11 59 26 (1 38)|
2 59 21 1 33
3 59 18 1 30
Now comes this calculation:—
11 59 18
1 6
———
12 0 24
33
———
11 59 51 midy pend. sup.
11 59 46 midy pend. inf.
———
$14''$ a ad.
4 May. 11 59 18 |(1 30)|

May 1.
H. d'Arcturus.

8^h	$8'$	$42''$		41^d	$20'$
8	22	33		43	30
8	25	42		44	0
8	29	0		44	30
8	32	15		45	0
8	35	36		45	30
8	38	52		46	0
8	42	15	epy	26	20
	46	5		26	40
9	46	4	le petit chien	13	30
	59	9		13	0
	2	12		12	30

The record gives no means of judging which clock was used in observing the altitudes, or when the pend. inf. was put back, The coincidence of clock-errors leaves no doubt that we here have the clock-correction for the unidentified observation at the Paris Observatory. I make the correction for quadrant — 39^s instead of — 33^s, and find, for the correction to reduce the "*pend. inf.*" to mean time, — $3^m\ 2^s$. This will make the time of beginning 58^s later than that observed by LA HIRE and the others, a quantity so great as to lead to the suspicion of a mistake of a minute in the record. The end agrees well with that observed by the LA HIRES. The observations of digits are too wild to merit consideration, and altogether it does not seem worth while to make any further use of these observations.

SERIES II.

Observations of LA HIRE.

In this series of observations, the clock-errors are more carefully determined than in the case of the observations of the CASSINIS. Occultations are found only in a few widely scattered years between 1682 and 1718, but the times are so well determined that they seem to compare favorably with modern occultations in precision. The transits of the sun, and occasionally of stars and planets, are observed over some meridian instrument which does not seem to have been disturbed while LA HIRE used it. The following are the corrections necessary to reduce the times of transit over the instrument to those over the true meridian as derived from the corresponding altitudes of the sun, which are found in the following pages:—

Date.	Clock-time of Transit of ⊙ over Merid. of Instrument.	Mean Clock-time of Corres. Altitudes.	Mean Interval.	Corr. for Mot. of ⊙.	Transit of ⊙ over True Meridian.	Corr. of Merid. Instrument.	Dec. of ⊙.
	h m s	h m s	h m	s	m s	s	° ′
1684, July 10	12 5 23.6	12 5 32.8	8 50	+ 6.0	5 38.8	+ 15.2	+ 22 15
Dec. 19	12 9 43.8	12 9 28.2	6 22	+ 0.3	9 28.5	− 15.3	− 23 26
1685, Feb. 13	12 6 28.0	12 6 32.0	6 32	− 19.0	6 13.0	− 15.0	− 13 .
May 28	11 58 50.0	11 59 9.9	7 13	− 6.6	59 3.3	+ 13.3	+ 21 26
July 16	0 0 7.8	0 0 12.2	11 0	+ 9.8	0 22.0	+ 14.2	+ 21 25
Sept. 14	0 4 58.6	0 4 30.4	8 54	+ 20.9	4 51.3	− 7.3	+ 3 29
Oct. 10	0 2 2.9	0 1 28.6	8 16	+ 21.3	1 49.9	− 13.0	− 6 35
Oct. 27*	. . .	. . .	. .	. .	. .	− 16.2	− 13 .
Nov. 27*	. . .	. . .	. .	. .	. .	− 15.2	− 21 .
1699, June 2*	0 2 1.8	. . .	. .	. .	2 20.0	+ 18.2	+ 22 .
Aug. 21	0 1 4.0	0 0 52.3	7 27	+ 15.3	1 7.6	+ 3.6	+ 12 22
Sept. 12	11 58 4.5	11 57 42.0	7 1	+ 18.7	58 0.7	− 3.8	+ 4 27
Oct. 23	0 0 17.2	11 59 41.6	8 34	+ 20.7	0 2.3	− 14.9	− 11 11
1706, May 6	0 0 16.5	0 0 39.6	8 31	− 13.5	0 26.1	+ 9.6	+ 16 26
1708, Sept. 16	11 58 38.0	11 58 9.7	8 49	+ 21.0	58 30.7	− 7.3	+ 2 37
1715, May 9	11 58 26.0	11 58 49.2	9 20	− 13.5	58 35.7	+ 9.7	+ 17 .

---

* For these three dates, I have accepted LA HIRE's reduction of his corresponding altitudes, as his reductions were found in other cases to be correct.

We now arrange these corrections according to the sun's declination, putting in a separate column those determined after the interval of 14 years between 1685 and 1699. We find them to be as follows:—

⊙'s Dec.	1684–5.		1699–1715.	Formula.
°	s	s	s	s
— 23	— 15.3		.	— 15.7
— 21	— 15.2		.	— 16.1
— 13	— 15.0	— 16.2	.	— 14.9
— 11	.		— 14.9	— 14.1
— 7	— 13.0		.	— 12.6
+ 3	— 7.3		— 7.3	— 6.6
4	.		— 3.8	— 5.7
12	.		+ 3.6	+ 2.7
16	.		+ 9.6	+ 8.0
17	.		+ 9.7	+ 9.0
21	+ 13.3	+ 14.2	.	+ 15.1
22	+ 15.2		+ 18.2	+ 16.6

There seems to be no evidence of any change in the instrument during the whole period of the observations. Supposing the axis on which it turned to be quite true, so that its deviation from the meridian arose only from errors of level, collimation, and azimuth, the correction necessary to reduce the time of transit of an object over it to the true meridian could be expressed in the form

$$m + c \sec \delta + n \tan \delta,$$

δ being the declination of the object. The values of the constants which best represent the above deviations are:—

$$m = - 121^{s}.4$$
$$c = + 112^{s}.7$$
$$n = + 39^{s}.8.$$

The numbers computed from these values of the constants are given above in the last column. They seem to represent the observed deviations within the probable errors of the observations. The following table shows the corrections computed from the formula:—

Decl.	Corrections.	Diff.
°	s	s
— 25	— 15.8	
— 20	— 15.9	— 0.1
— 15	— 15.3	+ 0.6
— 10	— 14.0	1.3
— 5	— 11.8	2.2
0	— 8.7	3.1
+ 5	— 4.8	3.9
10	0.0	4.8
15	+ 5.9	5.9
20	+ 12.9	7.0
25	+ 21.6	+ 8.7

We shall use this table in reducing transits to the true meridian in order to obtain clock-corrections.

Extracts from LA HIRE'S *Journal.*

Vol. 93, page 4.—LA HIRE'S first occultation, observed at Observatory.

1682, Feb. 15. ☉.

Mane.		Vesper.	
9 1 49	17 30	2 58 40	Correct. 37½. Il étoit donc midy a 11 59 55.
9 6 4	18 0	51 23½	
9 10 24	18 30	50 2	

Le 17 a midy l'horloge devoit se tarder de 37.

From altitudes of Cauda Leonis it seems the clock lost 28^m 52^s on sidereal time between February 10 and 17, or 11″½ a day on mean time.

The following are the altitudes on the 17th :—

1682. Feb. 17.	9^h 4′ 6″	Alt. = 28° 30′
	7 11	29 0
	10 15	29 30
	13 22	30 0

Eclipse of Hyades par la lune Feb. 15.

Doub. *	6 59 2	Emersion of *a.*	According to LE MONNIER, *Hist. Coeleste* p. 257, the
.	7 1 27	" *b.*	apparent times were 6 59 12, 7 1 37.

The corresponding altitudes of the sun give:—

Clock-time of ☉'s transit . . . . 23^h 59^m $54^s.9$,
While mean time of ☉'s transit is . . . . 0^h 14^m $41^s.7$.
Clock-correction . . . . $+ 14^m$ $46^s.8$.

The clock-rate being 11^s 5 per day, the error at the time of occultation would be $+ 14^m$ $50^s.2$. As a check upon the rate, I have computed the correction from the altitudes of β Leonis on February 17, and found, as the mean result from the four altitudes:—

Feb. 17, 9^h 9^m clock-time; correction $= + 15^m$ $10^s.5$.

This gives a rate of 10^s per day, and a correction at the time of occultation $0^s.4$ less than that found above. I have, however, used $+ 14^m$ $50^s.2$, giving:—

	θ^1 Tauri.	θ^2 Tauri.
Paris mean times of occultation . .	7^h 13^m $52^s.2$	7^h 16^m $17^s.2$
Greenwich mean times of occultation	7^h 4^m $31^s.2$	7^h 6^m $56^s.2$.

The equation of time being $+ 14^m$ $40^s.8$, these results do not differ one second from those given by LE MONNIER. The phase is actually immersion, not emersion.

☉ *Eclipse,* 1684, *July* 12.

Manuscript, vol. 93, page 287.—Observations of LA HIRE.

10 Julij.

Altitudines superioris Limbi ☉ pro horolog.

Mane.			
7 32 54½	31° 0′		
35 58	31 30	35′ 8″	Correctio 12½ addenda.
38 59	32 0	32 5½	
42 3	32 30	29 2	
45 5½	33 0	4 25 59½	

Meridies horologio indicante	12ʰ 5′ 38″½
⊙ Transitus prioris Limbi	12 4 15¼
Transitus posterioris Limbi	12 6′ 32″
	2 16¾
Transitus centri	12 5 23⅝
Transitus per. ver Meridianum	12 5 37
♀ Transitus centri	3ʰ 6 32½
Transitus veri Temp. per verum Merid.	3 0 55
♃ Transitus Centri	4ʰ 1′ 8″

11 Julij.

⊙ Transitus prioris Limbi	12ʰ 4′ 19″
Transitus posterioris Limbi	12 6 35¼
	2 16¼
Transitus centri	12 5 27⅛
Altitudo Merid. superioris Limbi	63 27 50
N Serpentarii Transitus	9 30 54½
et tardavit (?) horologium pro duobus diebus	10″½

12 Julij.

Altitudines superioris Limbi ⊙ pro horolog.

Mane.

5 36 5	21° 30′
39 8½	22 0
42 14	22 30
45 18½	23 0

Vespere Eclipsis Solaris.

Phases.	Tempus.	Phases.	Tempus.
29′ 56″	2ʰ 35′ 59″	11′ 5″	3ʰ 45′ 49″
27 51	41 49	12 45	56 49
27 13	43 59	13 45	4 2 29
24 55	49 59	14 39	6 9
23 36	53 49	16 14	10 49
22 4	57 29	19 32	19 39
19 55	3 3 49	21 23	24 19
17 56	9 59	23 36	30 39
16 14	16 29	26 46	37 39
14 1	23 49	29 37	44 19
13 4	27 9		
11 48	34 9		
11 0	42 9		

Initium 2 31 6 tempore horolog.
5 42½ corr. horol. subt.
2 25 23½ temp. vero.

Chordae.	Tempus.	Chordae.	Tempus.
13′ 30″	2ʰ 38′ 19″	27′ 15″	4ʰ 8′ 16″
17 5	45 49	23 55	22 19
21 15	55 9	22 20	26 39
22 50	3 0 19	19 5	34 0
25 49	7 49	12 45	43 9
26 27	13 34		
27 13	19 19		
28 34	29 39		
29 37	37 39		
28 24	59 19		

Finis totius Eclipseos, $4^{h}\,49'\,9''$.
Pars illuminata $17'\,44''$. $4^{h}\,14'\,49''$ Diam. Lunae $29'\,39''$.
Horologium accelerabat tempore Eclipseos $5'\,42''\frac{1}{2}$.
Fuit igitur finis veri temporis $4^{h}\,43'\,26''\frac{1}{2}$.

13 Julij.

Altitudines superioris Limbi ⊙ pro horologio.

Mane.			
8 33 12	40° 30′	3 38 5	Correctio addenda 12″.
36 19	41 0	34 58	
39 28½	41 30	31 49	
42 37	42 0	28 40	

In meridie sole existente, horolog. indicavit 12 5 44½.

The clock-corrections for this eclipse are derived as follows:—

Date.	Clock-time of Noon.	Mean Time.	Clock-correction.
1684.	h m s	h m s	m s
July 10	0 5 40.0	0 4 44.1	− 0 55.9
11	0 5 42.3	4 52.8	− 0 49.5
13	0 5 44.3	5 8.6	− 0 35.7

The single altitudes observed on the morning of July 12 could be made available for determining the clock-correction on that day; but the rate of the clock is so good that I have not deemed it necessary to go through the labor of discussing them. Interpolating between July 11 and 13, we find for the clock-error, before and after the eclipse:—

July 12, $2^{h}.1$	Clock-correction, $-42^{s}.0$.
July 12, $5^{h}.3$	Clock-correction, $-41^{s}.0$.

Occultation of μ Geminorum, 1684 *December* 21.

19 Decembris Mane ♍ Transitus . . . . $7^{h}\,25'\,7''$

Alt. ⊙ sup. limbi pro horolog.

Mane.		Vespere.	
$8^{h}\,53'\,55''$	6° 0′	$25^{m}\,2^{s}$	1″ correctio add.
56 54	6 20	22 2	
59 55	6 40	19 2	
9 2 57	7 0	3 15 59	

Centrum ⊙ transivit per merid. indicante horolog.		12 9 28¾
♀ Transitus centri		9 6 55½
⊙ Tran. prior. limbi	12 8 33	
" posterioris "	10 54½	
" centri	12 9 43¾	
Ceti os. transitus		9 0 1
Aldebaran "		10 31 37
☽ I "		10 33 46

20 Decembris.
Retroactum est horolog. 10′.
⊙ transitus I 11 59 0
" " II 12 1 22

Cent. 12 0 11

21 Decembris.
Ceti os. transitus 8 42 4.
Pro duobus diebus tardavit horolog. 5″.
Inter 21 et 22 in media nocte accelerav horol. 33″.
Accelerae hor. in media nocte 37″.

Vespere.

Occultatio stellae μ II a ☾ parte eclipsata 9 35 23
Emersio vel appar. ejus ✱ 10 9 2
Transitus ☽ I 12 1 44½ 2 16
II 12 4 0½ 1 8

22 Decembris.
⊙ I 11 59 53½
⊙ II 12 2 16

Cent. 12 1 4¾

The clock-corrections derived from the transits of the sun from December 19 to 22, and those of the moon and α Ceti on the 21st, are shown in tabular form below. The first transit of the sun is that derived from the corresponding altitudes. The tabular right ascension of the moon probably requires an increase of two seconds of time; this correction has therefore been applied to its tabular right ascension at the time of transit to obtain the mean time of transit.

Date.	Object.	Clock-time of Transit over Meridian Instrument.	Corr. for Deviation.	Clock-time of Transit over True Meridian.	Computed Mean Time of Transit.	Apparent Clock-correction.
1684.		h m s	s	m s	m s	m s
Dec. 19	⊙ . . .	0 9 43.8	− 15.9	9 28.5*	58 19.3	− 11 9.2
20	⊙ . . .	0 0 11.0	− 15.9	59 55.1	58 49.4	− 1 5.7
21	α Ceti .	8 42 4.	− 6.3	41 57.7	40 53.8	− 1 3.9
21	Moon . .	12 2 52.5	+ 17.0	3 9.5	2 6.0	− 1 3.5
22	⊙ . . .	12 1 4.8	− 15.9	0 48.9	59 49.8	− 0 59.1

The occultation was observed between the transits of α Ceti and the moon. The agreement of the clock-corrections and the uniformity of the rate seem to indicate that the times can be determined within a second. Deriving the clock-correction from the transits of α Ceti and the moon, we have:—

	Immersion.	Emersion.
Clock-corrections for occultation of μ Geminorum . .	— $1^{m}\ 3^{s}.8$	— $1^{m}\ 3^{s}.7$
Paris mean times	$9^{h}\ 34^{m}\ 19^{s}.2$	$10^{h}\ 7^{m}\ 58^{s}.3$
Greenwich mean times	$9^{h}\ 24^{m}\ 58^{s}.2$	$9^{h}\ 58^{m}\ 37^{s}.3$.

---

* From the corresponding altitudes.

1685, Feb. 13.

Altitudines sup. limb. ⊙ pro hor.

Mane.		Vespere.	
8h 46′ 14″	14° 20′	26′ 51″	
48 53	14 40	24 10	Correct. subt. 38″.
51 34	15 0	21 29	
54 17	15 20	18 48	

Solis cent. tetigit meridianum, indicante hor. 12 6 13.

⊙ transitus I 12 5 21
II 7 35

Centri 12 6 28

On 1684, Dec. 2, the transit of ⊙ was 14½″ late, so that there can be no doubt of the correction to La Hire's gnomon.

Here there is a lacune in Delisle's copy of La Hire, from which the preceding is copied; this lacune is afterward filled up from La Hire's original.

1685. For correction of La Hire's meridian.

A. M.	May 28	P. M.			
8 17 50	39 0	3 40 29	13½″ corr. subt.	⊙ Tr.	11 57 42
20 57	39 30	37 22½			11 59 58
24 4	40 0	34 16			11 58 50
27 11½	40 30	31 9		over mer.	11 59 3
					+ 13″
	July 16.				
6 20 56	19 30	5 39 26	} 21″ add.	⊙ Tr.	11 59 0½
24 2	20 0	36 21			12 0 16
39 30	22 30	20 58	19″ add.		
					12 0 7¾
	Sept. 14.				
7 32 34	17 0	4 36 26	42″ add.	Sept. 13 ⊙	19 4 26
35 45	17 30	33 16			12 6 34
38 56	18 0	30 6			
42 6	18 30	26 55	41″ add.		12 5 30
				per m.	5 21½
					8½
	Sept. 13.				
7 18 42	15 0	4 51 18	43″ add.	Sept. 16 ⊙	12 2 51½
					5 0
					12 3 55¾
	Oct. 10.				
7 48 21	12 0	4 14 38	+ 43″	Oct. 9, ⊙ tr.	12 1 22½
51 44	30	11 13			3 32
55 10	13 0	7 45	+ 42″½		12 2 27¼
58 35	13 30	4 23		Oct. 11. ⊙ tr.	12 0 32½
					2 42½
					12 1 37½

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Immersio stellae H Geminorum, 1685, Oct. 17. 9 52 29 Pend.

Oct. 16	☉ cent. transit	11	59	38	
17	Scheat Pegasi tr.	9	14	11	
	Markab.	9	15*	57	[* LE MONNIER prints 14, which is right, but it is clearly 15 in the MS.]
18	*α* Aquilæ	5	57	45	
	Scheat Peg.	9	10	5	
	Markab.	9	10	51	
20	☉	11	58	16.6	

27 Correction of quadrant per ☉ — $16^s\frac{1}{4}$.
Nov. 27 " " — $15^s\frac{1}{4}$.

The clock-corrections from 1685, October 16 to October 20, are derived from the observations as follows:—

Date.	Object.	Dec.	Corr. for Deviation.	Clock-time of Transit over True Meridian.	Computed Mean Time of Transit.	Apparent Clock-cor-tion.	*C′*.	△.
1685.		°	*s*	*h m s*	*h m s*	*m s*	*s*	*s*
Oct. 16	. . .	− 9.3	− 13.8	11 59 24.2	23 45 31.2	− 13 53.0	53.0	0.0
17	*β* Pegasi.	+ 26.3	+ 23.9	9 14 34.9	9 0 48.5	− 13 46.1	39.2	− 7.2
	α Pegasi.	+ 13.5	+ 4.0	9 15 1.1	9 1 20.4	− 13 40.7	39.2	− 1.5
18	*α* Aquilæ.	+ 8.1	− 1.9	5 57 43.1	5 44 14.4	− 13 28.7	30.5	+ 1.8
	β Pegasi.	+ 26.3	+ 23.9	9 10 28.9	8 56 52.0	− 13 36.9	29.2	− 7.7
	α Pegasi.	+ 13.5	+ 4.0	9 10 55.0	8 57 23.9	− 13 31.1	29.2	− 1.9
20	☉ . . .	− 10.7	− 14.2	11 58 2.4	23 44 49.4	− 13 13.0	13.0	0.0

The discordance of clock-errors is perplexing. There is a seemingly systematic difference of nearly six seconds between the corrections from *α* and from *β* Pegasi. As the latter lies without the limits between which the deviation of the instrument was determined, the corresponding result is to be received with suspicion. If we determine the clock-correction and rate from the transits of the sun on the 16th and 21st, we have the results in columns *c′* and △, the latter being the difference between the computed error and that derived from the intermediate observations. The most probable value of △ for the time of the occultation may be estimated at $-1^s.0$, with a probable error of 2^s. This will give for the occultation of *H* Geminorum:—

Clock-correction	$-\ 13^m\ 40^s.0$
Paris mean time of the occultation, October 17 .	$9^h\ 38^m\ 49^s.0$
Greenwich mean time of the occultation	$9^h\ 29^m\ 28^s.0 \pm 2^s$.

Mane, 19 August 1699.

Immersio Aldebaran	1^h	41^m	36^s
Emersio	2	19	37.

Sed etiam in momento apparuit magna et in disco ☾ reflexione luminis terrae illustratae.

The observed transits of ☉ were:—

	I.	II.	Cent.
Aug. 15	11 57 38	59 $48\frac{1}{2}$	58 $43\frac{1}{4}$
17	58 23	0 33	59 28
18	58 43	0 54	59 $48\frac{1}{2}$
21	59 59	2 9	1 4
A. M. Aug. 19 ♄	. . . .	. . . .	0 14 17

Aug. 21. Altitudines ⊙ pro horolog.

8 11 1	30 30	3 50 43½	
14 14	31 0	47 30	
17 28	31 30	44 18	Corr. 31″.
20 39½	32 0	41 4½	
23 50	32 30	37 48	

Centrum ⊙ pervenit ad Circulem meridianum indicante horologio 12^h 1′ 7″½.
Quare tardat quadrans muralis in altitudinem 53° 12′ . . . . 3½″.
On the 2d June preceding, he found a correction to the quadrant of +18″¼, as follows:—

⊙ Transit	June 1,	0 1 48
	5,	0 2 55
Debui transire	" 2,	0 2 1¾
Transit per alt. corresp.		0 2 20
Corr		+18¼

Again, Sept. 12, the correction was −4″. The change probably depends on the sun's Z. D.

The derivation of clock-corrections from transits of the sun is as follows:—

Date.	Dec.	Corr.	Clock-time of Transit over True Meridian.	Mean Time.	Corr. of Clock.	Hourly Rate.
	°	s	h m s	h m s	m s	s
1699. Aug. 15	+ 14.0	+ 4.7	11 58 47.9	0 3 55.9	+5 8.0	1.42
17	13.4	4.0	59 32.0	0 3 31.8	3 59.8	1.37
18	13.0	3.4	59 51.9	0 3 18.9	3 27.0	1.62
21	12.0	+ 2.2	61 7.2	0 2 37.5	1 30.3	

In obtaining the time of the last transit, double weight has been given to the result from equal altitudes. Interpolating between the last two corrections, we have, for the times of phases:—

	Immersion.	Emersion.
Clock-correction	+ 3^m 4^s.8	+ 3^m 3^s.8
Paris mean time, 1699, August 18 .	13^h 44^m 40^s.8	14^h 22^m 40^s.8
Greenwich mean time	13^h 35^m 19^s.8	14^h 13^m 19^s.8.

23 Sept. ⊙ Eclipsis, 1699, mane.

Initium	8^h 13′ 18″	Dig. 8 30	9 41 39
Dig. 0½	15 43	8 0	45 37
1	18 28	7 30	49 27
1½	22 19	6 30	55 42
2	25 30	6 0	10 0 16
2½	28 44	5 30	4 13
3	30 46	5 0	9 5
3½	34 19	4 30	12 47
4	37 6	4 0	15 55
4½	40 4	3 30	19 6
5	43 16	3 0	23 5
5½	46 55	2 30	27* 4

---

* It seems as if the minutes first recorded were 26, and that they were afterward changed to 27. There is no evidence to show with certainty whether this was simply to make the differences run more smoothly or not. The change was evidently made after taking the differences.

Dig. 6	8h 50′ 28″
6½	54 2
7	57 23
7 30	9 1 20
8	5 11
8 30	9 12
9	14 6
9 30	21 21
Maxima obscuritas.	
9 30	28 57
9 0	35 53

Dig. 2 0	10 30 26
1 30	33 53
1 0	37 19
0 30	39 57
finis	43 18

Diameter ⊙ cum micrometro 31′ 58″.

Tempore observationis horolog. tardebat 1′ 41″.

	⊙ tr. I.	II.	Cent.
Sept. 12	11 57 0	59 9	58 4½
13	56 35	58 43	57 39
11	57 27	59 39	58 31
20	58 30½	0 38½	59 34½
21	. .	0 16½	59 11½
22	57 45	59 52½	58 48¾
23	57 20½	59 29	58 24¾
26	56 8	58 17	57 12½
Oct. 22	59 8½	1 20½	0 14½
23	59 11	1 23½	0 17¼
24	59 14	1 26	0 20

Sept. 12.

Altitudines ⊙ pro horol. et quadrantis muralis deviatione.

8h 12′ 53″	25° 0′	42′ 30″	
22 58	26 30	32 26	
26 20	27 0	29 3	
29 47½	27 30	25 37	36¾
33 15	28 0	22 9	
36 44	28 30	3 18 42	

Oct. 23.

7 37 20	7° 0′	22 2
40 46	7 30	18 36½
44 15	8 0	15 7
47 45	8 30	4 11 41

Corr. 40½ add.

Oct. 23 Cent. ⊙ tr. per mer. circ. ind. horol.
12 0 1½

Quamobrem auferendum in haec altitudine ⊙ 15″¾ a transitu ⊙ centre per quadrantem muralem.

The clock-corrections are derived thus :—

Date.	Clock-time of Transit.	Mean Time of Transit.	Clock-correction.
1699.	h m s	h m s	m s
Sept. 20	23 59 26.2	23 53 9.3	− 6 16.9
21	59 3.0	52 48.6	− 6 14.4
22	58 40.0	52 28.0	− 6 12.0
23	58 15.8	52 7.5	− 6 8.3
26	57 2.8	51 7.0	− 5 55.8

The correction for the time of the eclipse is $-6^m\ 9^s$.

1701, 23 Sept. (mane).

Aldebaran occultata a Luna 6 10 50
6 7 0 veri temp.

Notandum quod stella jam supra discum Lunae quantitatae 1½ diametri suae apparebat quando omnino evanuit, et circiter post 2″ temporis centri stellae immersionis apparentis.

(A similar remark was made on the other occultation.)

Emersio . . 6 57 8
Veri temporis 6 53 18. L'horloge tarde de 35″ par jour.

There are no corresponding altitudes given since those of Oct. 23, 1669, but he seems to know the errors of his quadrant e. g.

20 Sept. 1701 ♀ centri Transitus per Quad. mur. 11ʰ 7′ 42″.
Transitus per Q. M. veri temporis 11 2 12½ altitudo ver. 50° 11′.
Transitus per v. merid. ver. temp. 11 2 12.
On the same day we find :—
Transitus centri ⊙ per vero merid. 12 5 28, indicating a correction of — 6″.

		⊙ tr. I.	II.	Cent.	
1701, Sept. 19	12	5 7½	7′ 16″	6 11¾	Sept. 23 per ver. merid. 12 3 41.
20		4 30	6 38	5 34	
21		3 35	6 3	4 59	
23		2 43	4 51	3 47	
24		2 8	4 16	3 12.	

There are no altitudes within the two years following, and no explanations of the data for deviation of the mural quadrant.

The clock-corrections, as derived from the transits of the sun, are:—

Date.	⊙'s Dec.	Corr.	Clock-time of Transit over True Meridian.	Mean Time of Transit.	Clock-correction.	Hourly Rate.
1701.	°	s	h m s	h m s	m s	s
Sept. 19	+ 1.6	— 7.5	0 6 4.3	23 53 40.2	— 12 24.1	0.72
20	+ 1.2	— 7.8	5 26.2	53 19.4	— 12 6.8	0.60
21	+ 0.8	— 8.1	4 50.9	52 58.6	— 11 52.3	0.66
23	+ 0.1	— 8.7	3 38.3	52 17.5	— 11 20.8	0.62
24	— 0.3	— 8.9	3 3.1	51 57.1	— 11 6.0	

Interpolating to the time of occultation, we have:—

	Immersion.	Emersion.
Clock-correction for time of phase	—11ᵐ 24ˢ.7	—11ᵐ 24ˢ.2
Paris mean time, Sept. 22	17ʰ 59ᵐ 25ˢ.3	18ʰ 45ᵐ 43ˢ.8
Greenwich mean time	17ʰ 50ᵐ 4ˢ.3	18ʰ 36ᵐ 22ˢ.8.

1706, ⊙ Eclipsis, 12 Maii, mane.

Initium circa 8ʰ 25ᵐ 0ˢ nam hora 8 25 10 jam apparebat Eclipsis quam proxime ⅛ digit quod ad visum per tubum patebatur.

Postea nubes frequentissimae nullas observationes habere permisserunt usque ad horam 8ʰ 48′.

Observationes sequentes habitae sunt horologio ut se habet et non correcto.

8ʰ 48′ 0″	19′ 59″	9 54 45	11 24
52 0	17 49	56 10	12 2
55 0	16 33	57 45	12 45
57 35	15 17	59 30	13 23
9 0 20	14 1	0 50	14 0
1 10	11 24	2 25	14 39
7 15	10 46	3 45	15 17
8 40	10 8	5 15	15 55
9 55	9 30	6 45	16 33

Transits of ⊙.

May 4	11 59 37	1 49	12 0 43
5	—	1 35½	0 29½
6	59 10	1 23	0 16½
7	—	1 10	0 3½
8	58 46	0 59	59 52½
9	58 36	0 48½	59 42¼
10	58 23	0 36	59 29½

9h 11′ 10″	8′ 52″	8 25	17 11
12 40	8 14	9 45	17 48
14 10	7 36	11 20	18 26
15 32	6 58	12 50	19 5
17 10	6 20	14 0	19 43
18 33	5 42	14 55	20 21
20 25	5 4	16 10	20 59
22 5	4 26	17 55	21 37
24 5	3 48	19 8	22 15
26 5	3 10	20 50	22 53
31 0	2 45	22 15	23 31
34 15	3 10	25 15	24 47
36 15	3 48	26 25	25 30
38 26	4 26	27 52	26 8
40 0	5 4	29 10	26 46
41 38	5 42	30 20	27 24
43 0	6 20	31 32	28 2
44 40	6 58	33 5	28 40
46 20	7 36	34 36	29 18
47 30	8 14	36 5	29 56
49 5	8 52	37 40	30 34
50 25	9 30	40 24	finis eclipsis accurate.
52 0	10 8		
53 30	10 46		

Tempore eclipsis tardabat horologium 42″.

May 11	11 58 10	0 24	12 59 17
12	—	0 13	59 6
14	57 43	59 56	58 49½

6 Maii pro meridie determinando altitudines ⊙.

h ′ ″	° ′	
7 37 36	28 30	23 44
40 41	29 0	20 38
43 42	29 30	17 36
46 49	30 0	14 30
49 54	30 30	11 27
52 58½	31 0	4 8 20

Centrum ⊙ tr. ind. horol. 12 0 26.

The results for clock-error, as derived from the transits of the sun, are as follows:—

Date.	Clock-time of Transit.	Mean Time of Transit.	Clock-correction.
1706.	h m s	h m s	m s
May 10	23 59 39.0	23 55 59.5	− 3 39.5
11	59 26.8	55 56.8	− 3 30.0
12	59 16.2	55 54.7	− 3 21.5
14	59 0.4	55 52.1	− 3 8.3

The resulting clock-correction at the beginning of the eclipse is $-3^m\ 22^s.7$, and at the end $-3^m\ 21^s.9$.

1708, 23 Februarii.

⊙ tran. I	11 59 8
II	12 1 21
Cent.	12 0 14½
pro merid.	12 0 1

♀ Eclipsis a ☾ Initium	7 3 47
Veri Temporis	7 3 48
Finis	7 3 57
	7 3 58

Feb. 24.

⊙ trans. I	11 59 2
II	12 1 13
Cent.	12 0 7½
pro merid.	11 59 54

1708, Sept. 14. mane. Eclipsis ⊙.

In media eclipsis horologium tardabat ex tempore vero 35″ sed correcto postea tempore per novas observationes tardabat 37″.

In sequentibus phasibus tempus verum notatum est. Sed addendum praeterea 2″ propter novas correctiones quadrantis. Initium non fuit observandum propter nubes.

Hora vera.	Diameter residua Solis Diametri illuminata.		
6 53 44	29′ 46″	7 24 32	20′ 16″
55 43	29 8	27 31	19 38
57 37	28 30	31 52	19 0
59 36	27 52	37 39	18 22
7 1 11	27 14	52 44	19 0
2 56	26 36	58 1	19 38
4 47	25 58	8 1 5	20 16
6 35	25 20	20 15	25 20
8 25	24 42	24 15	26 36
10 14	24 4	25 55	27 14
12 13	23 26	27 41	27 52
14 20	22 48	30 1	28 30
16 35	22 10	31 55	29 8
18 42	21 32	34 10	29 46
21 49	20 54	35 46	30 24
		fin 38 40	

Omnes istae observationes ope micrometri habitae fuerunt.

1708. Sun's Transits.

	I	II	C
Sept. 10	11^{h} 59′ 59″	2′ 7″	1′ 3″
11	59 32	1 41	0 36½
12	59 8	1 16½	0 12¼
14	58 20½	0 29	59 24¾
15	57 58	0 6	59 2
16	57 34	59 42	58 38

Sept. 16 alt. sup. limb. pro horol.

7 28 55	17° 0′	27 17 nubes	
32 7	17 30	24 11	11 58 29½
35 18	18 0	21 2	58 30
38 30	18 30	4 17 50 (41″)	11 58 30½

Ergo centrum ⊙ fuit in meridiano indicante horologio 11^{h} 58′ 30″. Ergo, subt. sunt 8″ in alt. ⊙ 44°.

Omnes ipsae observationes ope micrometri habitae fuerunt.

Diameter ⊙ post varias et repetitas observationes per transitum per meridianum et micrometrum non excessit 31′ 48″.

Hora 7^{h} 31′ 52″ linea ducta per cornua eclipsis distabat a limbo ⊙ illustrato 25′ 30″ et haec linea ad sensum horizonti erat equidistans.

The clock-corrections are deduced as follows:—

	1708, Sept. 12.	1708, Sept. 14.
Clock-times of sun's transit over quadrant	0^{h} 0^{m} $12^{s}.2$	23^{h} 59^{m} $24^{s}.8$
Clock-times of sun's true meridian . . .	0^{h} 0^{m} $6^{s}.6$	23^{h} 59^{m} $18^{s}.6$
Mean time	23^{h} 55^{m} $59^{s}.9$	23^{h} 55^{m} $18^{s}.4$
Clock-correction	-4^{m} $6^{s}.7$	-4^{m} $0^{s}.2$.

The correction on mean time is therefore $-4^m\ 1^s$ during the eclipse; and as La Hire has already applied $+35^s$, the total correction to his times is $-4^m\ 36^s$. The equation of time is $-4^m\ 38^s$, which agrees exactly with La Hire's direction to add 2^s more for reduction to apparent time.

The observations of the eclipse of 1710, 28th Feb., are given only in digits and fractions, and these only after the middle.

1711. Transits of ⊙'s Centre.

July 9	12	0	40½	July 16	12	0	52½
12		0	47	17		0	53½
14			50½	19		0	52½

July 15, Vesper, ⊙ Eclipsis.

Horolog.?	Portio Illum. Residua Diam.		
$7^h\ 16^m\ 0^s$	30′ 0″	$7^h\ 37^m\ 9^s$	19′ 8″
21 0	27 25	38 23	18 30
24 45	25 30	39 37	17 52
28 30	23 36	40 51	17 14
31 0	22 18	42 5	16 34
32 14	21 40	43 18	15 57
33 29	21 2	44 32	15 18
34 42	20 24	45 46	14 40
35 55	19 46	47 0	14 2

These cannot be actual observations; the times and measures progress too uniformly.*

"Journal des observations de M. De La Hire au mois de Decembre 1714.

"L'erreur de son Quad. etant sur la fin de l'année de 15″ soustraire l'on aura les midis vrais comme il suit."

1714. Dec. 10	11 58 13	11½	The obs. transits were	11 58 28
18	11 58 1½			58 16½

1715. Maij 3. mane.

Les observations de l'eclipse, telles qu'elles font icy ont este faites avec une horloge qui tardoit à l'egard de celle du cabinet de 21″.

Eclipsis ⊙ cum novo micrometro.

	Digit.	Residuum.	Digit
$8^h\ 12^m\ 16^s$ Initium.	0′ 0″	$9^h\ 26^m\ 0^s$	10′ 30″
17 25	1 0	29 0	10 0
22 50	2 0	35 31	9 0
27 54	3 0	38 42	8 30
32 25	4 0	42 24	8 0
36 20	4 30	44 46	7 30
41 36	5 30	48 10	7 0
44 3	6 0	50 50	6 30
46 45	6 30	54 0	6 0
49 16	7 0	56 51	5 30
52 6	7 30	59 22	5 0
54 56	8 0	10 2 10	4 30
57 30	8 30	8 32	3 30

---

* I am inclined to think that the practice of "cooking" observations was much more extensively practiced during the last century than is generally supposed. Jeaurat must have been a great sinner in this respect. In the Memoirs of the French Academy for 1779, he has a series of observations of the Pleiades, which are sometimes considered authoritative, but a very little examination shows to be fabrications of the clumsiest sort, so clumsy in fact that the author might be acquitted of intentional wrong-doing on that very ground. This is followed by a series of meridian observations of Jupiter, including *thirteen consecutive transits*, which give a uniform motion to the geocentric position. Among the observers discussed in the present section I find none but La Hire guilty of the objectionable practice, and he only in two or three instances, of which the worst occurs in connection with the solar eclipse of 1715.

	Digit.	Residuum.	
$9^h\ 0^m\ 4^s$	$9'\ 0''$	$10^h\ 12^m\ 14^s$	$3'\ 0''$
3 28	9 30	14 32	2 30
6 32	10 0	17 9	2 0
9 40	10 30	22 28	1 0
15 20	11 3	25 33	0 30
22 0	11 10 max.	28 47 fin.	

Alia observatio ope Imaginis ⊙ a filio. In Tabulam divisam recepta post Telescopium.

Initium.							
8	12	16	0	9	25	26	10½
	17	32	1		29	7	10
	20	12	1½		32	15	9½
	22	42	2		35	16	9
	25	8	2½		38	40	8½
	27	56	3		41	47	8
	30	49	3½		44	30	7½
	33	27	4		47	48	7
	36	17	4½		50	52	6½
	38	35	5		53	40	6
	41*	14	5½		56	43	5½
	44	12	6	10	0	3	5
	49	3	7		2	50	4½
	52	23	7½		6	0	4
	55	30	8		8	52	3½
9	7	6	10		12	1	3
	9	54	10½		17	28	2
	14	27	11		22	30	1
	18	53	11		28	45 finis.	

Diameter ⊙ ope micrometri 31′ 45″.† Tempore observationis horologium musei accelerabat supra verum tempus 16″. Igitur auferendum 16″ observationibus horologii Musaej.

Il faut ajouter 5″ à toutes les observations cy dessus pour les reduire au temps vray.

This is followed by a third table, beginning with Initium 8 12 16, and ending with finis 10 28 47, but without any explanation whatever except "Observationes limitatae ex meis sed cum 5″ pro defectu horologii". The times of the digits are, however, evidently smoothed off, on the curve principle, for they could never have been observed so nicely. I therefore regard them as worthless.

The fourth and fifth tables are as follows:—

Initium.											
8	12	27			52	45	7½		48	21	7
	17	39	1		55	41	8		51	21	6½
	20	15	1½	9	8	0	10		54	11	6
	22	51	2		11	15	10½		56	56	5½
	25	27	2½		14	38	11		59	46	5
	28	7	3		19	4	11	10	2	48	4½
	30	45	3½		25	37	10½		6	0	4
	33	24	4		29	1	10		9	10	3½
	36	5	4½		32	23	9½		12	10	3
	38	46	5		35	43	9		17	42	2
	41	29	5½		38	59	8½		22	46	1
	44	13	6		42	11	8		28	56 finis.	
	49	51	7		45	17	7½				

Il faut retrancher à toutes ces observations 6″.

[After writing this, I find that this may not be the original journal of La Hire, and that the doubtful tables are not found in the original journal. The latter I did not discover till later.]

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* 41 or 42; not legible.

† This being 6″ less than the real semidiameter, the question arises whether the error is in the scale of the micrometer.

Fifth table.

8 12 27	Initium.	52 34	7½	47 59	7
17 43	1	55 41	8	51 3	6½
20 23	1½	9 7 17	10	53 51	6
22 53	2	10 5	10½	56 54	5½
25 19	2½	14 38	11	10 0 14	5
28 7	3	19 4	11	3 1	4½
31 0	3½	25 37	10½	6 11	4
33 38	4	29 18	10	9 3	3½
36 28	4½	32 26	9½	12 12	3
38 46	5	35 27	9	17 39	2
41 25	5½	38 51	8½	22 41	1
44 23	6	41 58	8	28 56 finis.	
49 14	7	44 41	7½		

No explanation whatever.

Sun's Transits, etc.

May 1	12 0 43
2	12 0 23½
3	12 0 5¾
4	11 59 48
9	11 58 26.

Sup. limb.

May 9. Alt. ⊙ pro horolog. mane.

7 17 6	26 0	40 33	11 58 36
20 9	26 30	4 37 29	11 58 35½

May 3 Tr. cent. pro. Merid. veri temporis 12 0 14.

Correction 27″ auferenda a tempore seratino. Addenda igitur 10″ tempori transitus centri ⊙ pro quadrantem muralem in altitudinem centro ⊙ 58 26.

The difficulty respecting the duplicate records is cleared up by a comparison with La Hire's observations as printed in the "*Mémoires*" of the Academy for 1715. The first two tables are the records of the original observations themselves, which have been entirely suppressed in publication. The fourth table gives the "cooked" results of the second set of observations "par l'image du soleil", as printed in the Memoirs, and there is little doubt that the third set, which I did not copy, is the same as the first published set "avec le micromètre". The origin of the fifth table does not seem worth investigating.

The results for clock-error are as follows:—

Date.	Clock-time of ⊙'s Transit.	Mean Time.	Clock-correction.
1715.	*h* *m* *s*	*h* *m* *s*	*m* *s*
May 1	0 0 48.9	23 56 51.9	− 3 57.0
2	0 0 29.8	56 44.0	− 3 45.8
3	0 0 12.5	56 36.7	− 3 35.8
4	23 59 55.1	56 30.0	− 3 25.1

The error of the clock with which the transits of the sun were observed may be supposed $-3^m\ 37^s$ during the eclipse. This clock, however, was not that with which the eclipse was observed: respecting the latter, we have only the statement that it was 21 seconds slower. The correction of the clock actually used was therefore

$$-3^m\ 16^s.$$

1715, 25 July. Mane. Occult. ♃ a ☽.

Immersio limbi prioris ♃ in partem lunae lucidam	1 31 35
limbi posterioris ♃	1 32 51
Limbus prioris ♃ et transit immersionis	2 17 21
posterioris	2 18 37

July 22. ⊙ centre transit	11 59 58½	
23.	59 40¾	
24. ☾ limb. post.	6 20 16	
Veri tempore, Qua. mur. .	6 20 34	[*i. e.*, he adds 18^s for clock-correction and 4″ for error of quadrant.]
per merid. .	6 20 38	
♃ tr. centri	7 8 10½	
true time	29	
per meridian	39	[So he considers the correction 10″.]
⊙ tr. centri	11 59 25¼	
per meridian	11 59 37½	[Correction 12″, it seems.]
July 25. ⊙ centre tr.	11 59 7¼	
per meridian	11 59 19	

I find no further data for the correction of the quadrant.

From the transits of the sun we have:—

Date.	⊙'s Dec.	Corr.	Clock-time of Transit over True Meridian.	Mean Time of Transit.	Clock-correction.	Hourly Rate.
	°	s	h m s	h m s	m s	s
July 22	+ 20.3	+ 13.4	0 0 11.9	0 5 47.9	+ 5 36.0	0.84
23	20.1	13.1	11 59 53.8	0 5 50.1	+ 5 56.3	0.75
24	19.9	12.8	11 59 38.0	0 5 52.2	+ 6 14.2	0.82
25	19.7	12.5	11 59 19.7	0 5 53.6	+ 6 33.9	

Interpolating between the transits of the sun on July 24 and 25, we find, for the times of the four contacts:—

	(1)	(2)	(3)	(4)
Clock-corrections	$+6^m\ 25^s.3$	$+6^m\ 25^s.3$	$+6^m\ 25^s.8$	$+6\ 25^s.8$
Paris mean times	$1^h\ 38^m\ 0^s.3$	$1^h\ 39^m\ 16^s.3$	$2^h\ 23^m\ 46^s.8$	$2^h\ 25^m\ 2^s.8$
Greenwich mean times	$1^h\ 28^m\ 39^s.3$	$1^h\ 29^m\ 55^s.3$	$2^h\ 14^m\ 25^s.8$	$2^h\ 15^m\ 41^s.7$.

1718, Sept. 9.

8 43 34 l'Immersion d'une petite etoile par le corps de la lune.

Sept. 5	⊙ tr.	11 58 57½	12 1 7	12 0 2¼
8		57 32½	59 40½	58 36½
10		56 35½	58 43½	57 39½

The clock-corrections from the transits of the sun are:—

Date.	⊙'s Dec.	Corr.	Clock-time of Transit over True Meridian.	Mean Time of Transit.	Clock-correction.	Hourly Rate.
1718.	°	s	h m s	h m s	m s	s
Sept. 5	+ 6.8	− 3.3	12 59 58.9	23 58 30.2	− 1 28.7	0.38
8	5.7	4.2	58 32.3	57 30.8	− 1 1.5	0.36
10	4.9	4.9	57 34.6	56 50.2	− 0 44.4	

We hence obtain:—

Clock-correction for the time of immersion . . .	$-49^s.9$
Paris mean time, September 9	$8^h\ 42^m\ 44^s.1$
Greenwich mean time	$8^h\ 33^m\ 23^s.1$.

The star is B. A. C. 8184.

SERIES III.

Observations by DELISLE *at or near the Luxemburg.*

Volume 113, MS. No. 1012. Observations Astronomiques, faites au Luxembourg par De l'Isle.
(About 750 toises *north* of the Observatory.)

1713, Novembre 30.	⊙ on gnomon	11 59 57¾
Dec. 1.	" " "	0 0 24½

Occultation of τ Tauri (5th mag.), 2 Dec., matin .	0 9 19 clock;	0 ?8 39¾ t. vr.
Dec. 3. ⊙ on gnomon	0 1 22¾	
4. " " "	0 1 54	

1713, June 21. Error of gnomon per equal altitudes less than 1^s.
1714, Jan. 26. Morning alt. $8^h\ 49^m\ 0^s$ = evening alt. $3^h\ 12^m\ 47^s$.

Mean of this and 8 others gives transit of ⊙ = ...	0 0 41.2
(The correction for change of dec. being -13^s.)	
⊙ on gnomon	0 0 40¾

From the observations on January 26, 1714, the correction of the gnomon is about $+0^s.4$. This correction may be considered as applicable to the transits of December 1 and 3 previous. We thus have:—

	1713, Dec. 1.	1713, Dec. 3.
Clock-times of ⊙'s transit	$0^h\ 0^m\ 24^s.9$	$0^h\ 1^m\ 23^s.2$
Mean times	$-10^m\ 27^s.0$	$-9^m\ 39^s.9$
Clock-corrections	$-10^m\ 51^s.9$	$-11^m\ 3^s.1$.

Clock-time of occultation of τ Tauri, Dec. 1	$12^h\ 9^m\ 19^s$.
Clock-correction	$-10^m\ 54^s.7$
Paris mean time	$11^h\ 58^m\ 24^s.3$
Greenwich mean time	$11^h\ 49^m\ 3^s.3$.

1714, Mar 20.	Imm. of ∗ B of 6th mag	9 6 50 clock.	9 8 21 t. vr.
	The star passed only 4′ within the moon's southern limb.		
1714, Mar 21.	Imm. of ο Tauri, 6th mag. . . .	10 15 54½ clock.	10 18 9¼ t. v.
	Cette immersion a été observée à l'observatoire à 10 18 9 t. vray.		

Mar 17.	⊙ on meridian per equal altitudes (6 in number) . .	0 0 45¼ }
"	" " gnomon	0 0 44¼ }
18.	" " "	0 0 4½
20.	" " "	11 58 45
"	" " meridian per 10 equal altitudes	11 58 45.4
21.	" Limb on gnomon	11 59 8
	Transit of semidiameter from other days	1 5
"Le pendule a retardi de 23″ du le 20 au 21 sur le moien mouve. du Soleil."		11 58 3
22.	⊙ on gnomon	11 57 21½

Applying $+0^s.7$ for correction of gnomon, we have the following clock-corrections from transits of the sun:—

Date.	Clock-time of Transit of ⊙ over True Meridian.	Mean Time of Transit.	Clock-correction.
1714.	h m s	h m s	m s
Mar. 17	0 0 45.2	0 8 41.2	+ 7 56.0
18	0 0 5.2	0 8 23.4	+ 8 18.2
20	11 58 45.4	0 7 46.8	+ 9 1.4
21	11 58 3.7	0 7 28.4	+ 9 24.7
22	11 57 22.2	0 7 9.8	+ 9 47.6

The clock-rate seems very good for this epoch. Interpolating the clock-corrections to the times of the occultations, we have:—

	1714, Mar. 20, ✱ B.	1714, Mar. 21, o Tauri.
Clock-times of occultation . .	$9^h\ 6^m\ 50^s$.	$10^h\ 15^m\ 54^s.5$
Clock-corrections	$+9^m\ 10^s.2$	$+9^m\ 34.^s4$
Paris mean times	$9^h\ 16^m\ 0^s.2$	$10^h\ 25^m\ 28^s.9$
Greenwich mean times	$9^h\ 6^m\ 39^s.2$	$10^h\ 16^m\ 7^s.9$.

I have not certainly identified ✱ B, but it is near B. A. C. 1373.

1714, April 7, Matin. Imm. of ξ Sagittarii (bright limb). . . . 3 20 48 clock. 3 24 22½ t. vr.
(Suddenly to the ½ second), Emersion (dark limb). 4 34 1½ clock. 4 37 38 t. vr.

Il y avoit deja quelques seconds que l'etoile avoit touché le bord eclairé de la lune & elle paraissoit se meler avec l'ondulation qui se faisoit tout autour du bord eclairé.

(Page 75.) He adds that at the Observatory the observed times were, Immersion 3 24 19; Emersion 4 37 25. He is surprised at the differences of 3½ and 13^s, and enters into a long account of his grounds for believing that the error is not on his side, the only weak point being the want of a clock-error between the 5th and 8th. He considers it possible, however, that he may have forgotten to subtract the 10^s which he counted between the moment of emersion and that of noting the clock-time; if so, his time should be 4 37 28.

Apr. 5.	⊙ on gnomon,	11 57 32½
8.	" " "	11 55 30
9.	" " "	11 54 50
10.	" " "	11 54 6

Applying $+0^s.5$ for gnomon, we have:—

	1714, April 5.	1714, April 8.
Clock-times of ⊙'s transit . .	$11^h\ 57^m\ 33^s.0$	$11^h\ 55^m\ 30^s.5$
Mean times	$0^h\ 2^m\ 48^s.7$	$0^h\ 1^m\ 55^s.6$
Clock-corrections	$+5^m\ 15^s.7$	$+6^m\ 25^s\ 1$.

Occultation of ξ Sagittarii, April 6:—

	Immersion.	Emersion.
Clock-times of observation .	$15^h\ 20^m\ 48^s$	$16^h\ 34^m\ 1^s.5$
Clock-corrections	$+5^m\ 53^s.6$	$+5^m\ 54^s.8$
Paris mean times	$15^h\ 26^m\ 41^s.6$	$16^h\ 39^m\ 56^s.3$
Greenwich mean times . . .	$15^h\ 17^m\ 20^s.6 \pm 2^s$	$16^h\ 30\ \ 35^s.3 \pm 2^s$.

These times agree so well with those noted at the Observatory (see *post*) that his opinion of a difference of ten seconds seems to be erroneous.

1714, Sept. 27 (p. 101), Soir Emersion of Tauri (5th mag.), dark limb, 9 18 42 cl. 9 19 8¼ t. vr.
Oct. 3. Matin Em. of *u* (?) Scorpii, very exact, dark limb, 2 58 14 cl. 2 58 9 t. vr.

Sept.	19.	⊙ on gnomon . . .	11 58 7	La pendule a été avancée de 2 minutes.
	20.	. . . .	11 59 46½	
	22.	Second limb . . .	0 0 19 — 1 3½	La pend. a été avancée 1 minute.
	24.	Second limb . . .	0 0 38 — 1 3½	
	25.	Cent.	11 59 16½	Pend. avanceé 1 minute.
	26.	. . . .	11 59 58½	
	27.	. . . .	11 59 40½ (?)	Le fil n'etoit pas trop bien placé auprès du pied du style.
Oct.	1.	. . . .	11 58 31	La pend. avancée 2 minutes.
	2.	. . . .	0 0 14½	
	3.	. . . .	11 59 59½	
	5.	. . . .	11 59 30¼	

It cannot be inferred from the statements whether the clock was put forward before or after the transits of the sun.

Applying no correction to the gnomon, which seems to have been adjusted with great care, we have the following results for clock-correction:—

Date.	Clock-time of ⊙'s Transit.	Mean Time.	Clock-correction.
1714.	*h m s*	*h m s*	*m s*
Sept. 26	11 59 58.5	11 51 19.9	− 8 38.6
Sept. 27	11 59 40.5	11 51 0.0	− 8 40.5
Oct. 1	11 58 31.0	11 49 42.4	− 8 48.6
Oct. 2	0 0 14 5	11 49 23.8	−10 50.7
Oct. 3	11 59 59.5	11 49 5.4	−10 54.1

We hence deduce:—

	ω^2 Tauri.	α Cancri.
Clock-times of emersion, 1714,	Sept. 27, $9^h\ 18^m\ 42^s$.	Oct. 2, $14^h\ 58^m\ 14^s$.
Clock-corrections	$-8^m\ 41^s.3$.	$-10^m\ 52^s.7$.
Paris mean times	$9^h\ 10^m\ 0^s.7$.	$14^h\ 47^m\ 21^s.3$.
Greenwich mean times	$9^h\ 0^m\ 39^s.7$.	$14^h\ 38^m\ 0^s.3$.

The designation of the second star is clearly a mistake.

1715, May 3, Matin. Beginning of Eclipse ⊙ . . 8 12 57 clock = 8 12 35 t. vr.
End . . . . 8 28 0 = 8 28 38

But owing to the intervention of clouds, he is not sure but that the latter moment is some seconds too early.

La pendule a été arreté.

				Centre.
May	1.	⊙ I. limb on gnomon	11 58 45½	+ 1 6
	2.	Centre	11 59 35	

June 28. He does not give the clock-times of the occultation of Venus, but only the t. vr. 1 30 19 and 2 37 17, as already printed.

"Je suis sorti de Luxembourg a la fin du mois de Septembre 1715 par ordre de Madame la Duchesse de Berry."

The observations of the eclipse on May 2 do not admit of an accurate reduction, owing to the stopping of the clock. DELISLE's reduction may therefore be accepted. The equation of time being — $3^m\ 22^s$, the times are:—

Beginning of eclipse	$8^h\ 9^m\ 13^s$	Paris mean time.
	$9^h\ 59^m\ 53^s$	Greenwich mean time.
End of eclipse	$8^h\ 25^m\ 16^s$	Paris mean time.

The next observations are made at the *Hotel de Tarranne*, about 1′ north of the Observatory, and about $0^s.7$ west, so that the longitude east of Greenwich may be supposed $9^m\ 20^s.3$.

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Page 90.—Occultation of Aldebaran, 1717, Sept. 25, soir.

"Le bord de la lune était denteté à cause de sa proximité à l'horizon & Aldeb. toucha cette denteture à 9 12 15 de la pendule, au quel tems je ne le pus plus distinguer. Le tems vrai est à 9 11 38."

Emersion, dans un instant 10 4 34½, Pend. = 10 3 57.

Sept. 25. Alt. ⊙ Lower L.

			Midy vray.	
7 31 27	16° 35′	4 1 3	11 46 36	Moyen 11 46 37.2.
33 40	16 55	3 58 54	38	
35 51	17 15	56 41	37	
38 2	17 35	54 31	37½	

La pendule a été avancée de 14′.

Sept. 26. Alt. ⊙ 12 obs. The first and last are:—

7 47 23	16 35	4 13 8	0 0 36½	Mean of 12, 0 0 38½; gnomon 0 0 23.
8 11 53	20 15	3 48 44	0 0 39½	

The clock-corrections are derived as follows:—

	1717, Sept. 25.	1717, Sept. 26.
Clock-times of ⊙'s transit	$0^h\ 0^m\ 37^s.2$	$0^h\ 0^m\ 38^s.3$
Mean times	$23^h\ 51^m\ 34^s.6$	$23^h\ 51^m\ 14^s.6$
	$-9^m\ 2^s.6$	$-9^m\ 23^s.7$.

Occultation of α Tauri:—

	Immersion.	Emersion.
Clock-times	$9^h\ 12^m\ 15^s$	$10^h\ 4^m\ 34^s.5$
Clock-corrections	$-9^m\ 10^s.7$	$-9^m\ 11^s.5$
Paris mean times, September 25 . . .	$9^h\ 3^m\ 4^s.3$	$9^h\ 55^m\ 23^s.0$
Greenwich mean times	$8^h\ 53^m\ 44^s.0$	$9^h\ 46^m\ 2^s.7$.

But the immersion may be observed a little early.

1718, Jan. 16. $1^h\ 27'\ 14''$. Immersion of λ Geminorum ($15^d.6$, I think).

Jan. 16.	Tr. of sun per. corresp. altitudes (uncorr.)	0 4 13.8
	Mean interval, $6^h\ 12^m$ corr.	11.
	Gnomon $0^h\ 4'\ 1''.0 = \Phi$	0 4 2.8

Jan. 11. $\Phi =$ 0 7 1 et 8′ a été retranché.
Jan. 12. 11 59 57
16. 0 4 1.0 la pendule a été retardé de 4′.
18. 0 2 29.5

Adding 1^{s} for gnomon, taking the time of transit for January 16 from the corresponding altitudes (true correction $-11^{s}.6$), and reducing the artificial changes in the clock to its state on January 15, we have:—

Date.	⊙'s Transit per Clock.	Mean Time of Transit.	Clock-correction.	Hourly Rate.
1718.	h m s	h m s.	m s	s
Jan. 11	11 59 2.0	0 8 33.3	+ 9 31.3	− 1.36
12	11 59 58.0	8 56.6	8 58.6	− 1.64
16	0 4 2.2	10 23.7	6 21.5	− 2.27
18	0 6 30.5	11 3.1	+ 4 32.6	

Interpolating the clock-correction to the time of observation, we have:—

Clock-time of immersion of λ Geminorum, 1718, Jan. 15 . . .	$13^{h}\ 27^{m}\ 14^{s}$
Clock-correction	$+6^{m}\ 41^{s}$
Paris mean time	$13^{h}\ 33^{m}\ 55^{s}$
Greenwich mean time	$13^{h}\ 24^{m}\ 34^{s}.7 \pm 2^{s}$.

Page 127.—1718, Feb. 9. Soir. Imm. Aldebaran* 6 19 44 = 6 16 48 t. vr., or 6 16 53, which he thinks is more exact, because derived from transits of stars as well as ⊙. Afterward he finds that 6 16 48 is after all the most probable time from the mean of all methods. The probable error does not seem to be so much as 2^{s}

Feb. 6. ⊙ on gnomon . . . . 0 8 41 Pend. ret. 9 min.

Clock has gained 5′ since Feb. 1, about 1′ per day.

Feb. 10. ⊙ on gnomon 0 3 39

The correction to gnomon is $+0^{s}.7$.

Accepting Delisle's reduction, the equation of time being $+14^{m}\ 47^{s}.4$, we have:—

Paris mean time of occultation of Aldebaran, 1718, Feb. 9 . .	$6^{h}\ 31^{m}.\ 35^{s}.4$
Greenwich mean time	$6^{h}\ 22^{m}\ 15^{s}.1 \pm 2^{s}$.

Page 133.—*o* Leonis, Feb. 14, soir, l'etoile a paru toucher dans son immersion la partie eclairée. J'ai cessé de l'apercevoir à 6 52 39 de la pendule.

Feb. 14. ⊙ on gnomon, 0 7 43.
15. 0 8 43.

It seems doubtful whether the immersion of *o* Leonis is worth using. The real occultation was probably not seen. There is room for suspecting a change in the correction to the gnomon.

1718, Sept. 9.

$8^{h}\ 44'\ 49''$ Une etoile se cache sous le bord de la lune.
46

8 45 35

				Cent.
Aug. 19.	⊙ tr.	$0^{h}\ 0'\ 45''$	$2'\ 56''$	$1'\ 50''\frac{1}{2}$
Sept. 5.		11 58 17½	0 26½	59 22
7.		58 12½	0 21	59 16¾
8.		58 9	0 17	59 13
10.		58 11	0 19	59 15
Nov. 8.		3 8†	5 25	4 16½

Nov. 8.—12 corr. alts. ⊙.

Mean int. . . .	$6^{h}\ 23^{m}$
Uncorr. mean . .	0 3 58.3
Corr.	+ 16
Aug. 19. Mean int.	11 28
Mean of 9 corr. alts.	0 1 32.1
Correction . . .	20

---

* This same occultation Delisle says was observed at Toulon, "dans le Semenaire Royal de la Marine," by Le P. Laval. Imm. 6 40 27, Em. 7 47 40, Dur. 1 7 13; the clock being corrected by different corresponding heights of the sun on the 9th and 10th.

† Somewhat doubtful, from being obliged to use a watch in counting the seconds.

The results for clock-error are derived thus:—

Date.	Clock-time of ⊙'s Transit.	Mean Time.	Clock-correction.	Hourly Rate.
1718.	*h* *m* *s*	*m* *s*	*m* *s*	*s*
Sept. 5	11 59 22.5	58 30.3	− 0 52.2	+ 0.72
7	17.3	57 50.7	1 26.6	+ 0.67
8	13.5	57 30.8	1 42.7	+ 0.89
10	15.5	56 50.2	− 2 25.3	

We have:—

Aug. 19.	Correction of equal altitudes	$+21^{s}.1$
	True transit	$0^{h}\ 1^{m}\ 53^{s}.2$
	Gnomon	$1^{m}\ 50^{s}.5$
	Correction	$+\ 2^{s}.7.$
Nov. 8.	Correction of equal altitudes	$+15^{s}.8$
	True transit	$4^{m}\ 14^{s}.1$
	Gnomon	$4^{m}\ 16^{s}.5$
	Correction	$-\ 2^{s}.4.$

I have used $+0^{s}.5$.

We then have, for the time of occultation:—

Clock-time, 1718, September 9	$8^{h}\ 44^{m}\ 49^{s}.$
Clock-correction	$-2^{m}\ 11^{s}.8$
Paris mean time	$8^{h}\ 42^{m}\ 37^{s}.2$
Greenwich mean time	$8^{h}\ 33^{m}\ 16^{s}.9 \pm 2^{s}.$

Page 245.—1719, Apr. 22, soir. Imm. Aldeb. dark limb, 7 44 44 clock = 7 44 32 t. vr.
Em. " bright " 8 34 24 = 8 34 14

Dans cette observation l'etoile n'etoit point encore detachée du bord eclairé de la lune.

Apr. 22.	True noon per 13 pairs equal altitudes	0 0 31.7
	⊙ on gnomon	0 0 32.5
23.	" " "	11 59 31.5

The results of the observations are:—

	Apr. 22.	Apr. 23.
Clock-times of sun's transit	$0^{h}\ 0^{m}\ 31^{s}.7$	$11^{h}\ 59^{m}\ 30^{s}.7$
Mean times	$25^{h}\ 58^{m}\ 25^{s}.8$	$23^{h}\ 58^{m}\ 13^{s}.4$
Clock-corrections	$-2^{m}\ 5^{s}.9$	$-1^{m}\ 17^{s}.3.$

Occultation of Aldebaran.

	Immersion.	Emersion.
Clock-times of phase, 1719, April 22 .	$7^{h}\ 44^{m}\ 44^{s}$	$8^{h}\ 34^{m}\ 24^{s}.$
Clock-corrections	$-1^{m}\ 50^{s}.2$	$-1^{m}\ 48^{s}.6$
Paris mean times	$7^{h}\ 42^{m}\ 53^{s}.8$	$8^{h}\ 32^{m}\ 35^{s}.4$
Greenwich mean times	$7^{h}\ 33^{m}\ 33^{s}.5$	$8^{h}\ 23^{m}\ 15^{s}.1.$

Page 249.—1719, Aug. 21. Imm. γ Libræ, very exact, 7 41 31 cl. = 7 40 12 t. vr.

Equal altitudes of ⊙'s lower limb (?).

	Aug. 21.		Aug. 22.
Alt.	A. M.	P. M.	A. M.
11° 45′	6 31 42½	6 5 28½	6 16 43
13 45	44 0½	5 53 13	28 58½
14 15	47 3	50 3	32 3
20 25	7 24 47	12 32	
20 45	26 47	10 32	7 11 47½
21 5	28 34	8 27	13 52

Mean Aug. 22.0 . .	0 18 40
Corr.	+ 19
	0 18 59
Subtr.	19 0
Aug. 22.0	11 59 59
Aug. 22.5. Mean of last 2,	0 1 40
Correct.	23
	0 2 3

Clock put back 19 minutes between Aug. 21, p. m., and Aug. 22, a. m.
Owing to clouds and fog, DELISLE rejects the three top lines altogether.

DELISLE's correction for midnight seems all wrong. The corrections for noon and midnight are $+18^s.6$ and $-27^s.4$ respectively, whence we obtain:—

	1719, Aug. 21.0.	1719, Aug. 21.5.
Clock-times of sun's transit, corrected for change of 19^m	$23^h\ 59^m\ 58^s.4$	$12^h\ 1^m\ 12^s.2$
Mean times	$0^h\ 2^m\ 51^s.2$	$12^h\ 2^m\ 44^s.1$
Clock-corrections	$+2^m\ 52^s.8$	$+1^m\ 31^s.9$

Clock-time of immersion of γ Libræ, 1719, August 21 .	$7^h\ 41^m\ 31^s.$
Clock-correction	$+2^m\ 1^s.1$
Paris mean time	$7^h\ 43^m\ 32^s.1$
Greenwich mean time	$7^h\ 34^m\ 11^s.8.$

The dates Aug. 22.0 and Aug. 22.5 in my manuscript, and as printed above without change, are, without serious doubt, one day in error. The computation is, however, that of DELISLE, and it is evident that he has deduced his "Temps vray" from the erroneous deduction of the clock-time of midnight.

Page 259.—1719, Oct. 30 (?) Immersion of Aldebaran (inst.) 8 56 34 clock = 9 2 54 t. vr.
Emersion, dark limb. . . . 9 53 3½ = 9 59 29½
Duration 56 29½

Oct. 29.	Equal alt. ⊙.	Oct. 30.	12 altitudes very accordant.	
8 27 27	3 13 45	$7^h\ 47'\ 12''$	7° 25′	$4^h\ 1'\ 14''\frac{1}{2}$
30 0	11 9	. . .	. .	. . .
32 38	8 32	. . .	. .	. . .
35 21½	5 49	. . .	. .	. . .
38 3½	3 5	8 13 56	11 5	3 34 29
40 46	0 24			

Mean noon Oct. 29	11 50 35	Mean of 12	11 54 12.9
	18½	Correction	+ 19.5
Corrected	11 50 53½		11 54 32.5
Clock advanced	6 0		
	11 56 53½		

The corrections for motion of sun in declination I find to be $+18^s.6$ and $+19^s.0$. The reduction of the observations therefore stands:—

	1719, Oct. 29.	1719, Oct. 30.
Clock-times of transit of ⊙	$11^h\ 56^m\ 53^s.6$	$11^h\ 54^m\ 31^s.9$
Mean times	$11^h\ 43^m\ 58^s.0$	$11^h\ 43^m\ 54^s.8$
Clock-corrections	$-\ 12^m\ 55^s.6$	$-\ 10^m\ 37^s.1$.

The clock-correction must now be carried forward eight hours with the rate derived from the observations of the two days.

Occultation of Aldebaran.

	Immersion.	Emersion.
Clock-times of phase, 1719, Oct. 30 .	$8^h\ 56^m\ 34^s$.	$9^h\ 53^m\ 3^s.5$
Clock-corrections	$-9^m\ 44^s\,9$	$-9^m\ 39^s.4$
Paris mean times	$8^h\ 46^m\ 49^s.1$	$9^h\ 43^m\ 24^s.1$
Greenwich mean times	$8^h\ 37^m\ 28^s.8\ \pm 3^s$	$9^h\ 34^m\ 3^s.8\ \pm 3^s$.

These times are 1^s greater than those obtained by correcting DELISLE's result for the equation of time, $-16^m\ 6^s$. The difference arises from the change of $0^s.5$ in the correction for noon on October 30.

Total eclipse of ⊙, 1724, May 22.8 (?). 2d part of page 95. At the Royal Observatory, whither he had transported his instruments.

J'ay commencé à l'apercevoir à $5^h\ 53'\ 24''$ de ma pendule, mais le vray commencement a peu arriver un peu plustot, parceque je ne regardois pas dans ce tems la precisement à l'endroit ou la lune est entree, et que je ne m'en suis apercu que lorsqu'elle occupoit une petite portion de quelques degres du bord du soleil. Le tems vray est à 5 55 18 d'ou je crois pouvoir mettre le commencement a 5 55 0. La Totalité m'a paru se faire à 6^h 46 55 pend = 6 48 54 t. vr. Le recouvrement de lumiere m'a aussi paru se faire 6 49 13 = 6 51 12, ainsi l'obscurite a duré $2'\ 18''$.

May 21. CASSINI'S clock at app. noon 11 57 0 from 16 equal alts. He afterward put the clock forward $3'$. Allowing for this, the sun passed the mural quadrant as follows:—

May 21	11 59 56
22	11 59 51
24	11 59 48

Comparison of clocks, May 22, evening.

DELISLE	3 18 27	19 27	5 3 16½	4 16½	7 11 4	12 3½
CASSINI	20 0	21 0	5 0	6 0	13 0	14 0
Diff.	1 33	1 33	1 43½	1 43½	1 56	1 56½

I have not yet reduced and discussed these observations.

1725, Feb. 19.5. Imm. of Tauri, exact dark limb. $0^h\ 14'\ 24'' = 0^h\ 11'\ 18''$ t. vr.

Corrections of Gnomon.	s	Transits of ⊙ over Gnomon.			
Jan. 8	0.0	Feb. 17	0	2	4¼
Sept. 13	+ 2.7	19	0	2	52.7
20	− 0.7	20	0	3	19.1

Assuming the gnomon to be correct, the reduction stands:—

	Feb. 19.	Feb. 20.
Clock-times of transit	$0^h\ 2^m\ 52^s.7$	$0^h\ 3^m\ 19^s.1$
Mean times	$0^h\ 14^m\ 18^s.7$	$0^h\ 14^m\ 12^s.0$
Clock-corrections	$+11^m\ 26^s.0$	$+10^m\ 52^s.9$.

Immersion of A^1 Tauri, clock-time, 1725, Feb. 19	$12^h\ 14^m\ 24^s.$
Clock-correction	$+11^m\ 9^s.2$
Paris mean time	$12^h\ 25^m\ 33^s.2$
Greenwich mean time	$12^h\ 16^m\ 12^s.9.$

SERIES IV.

This is perhaps to some extent a continuation of Series I., by the CASSINIS and MARALDIS. I have not attempted to identify the individual observers. The system of observation was the same as before, the transits of the sun being regularly observed with the mural quadrant, and the true times of transit occasionally determined by corresponding altitudes, and the correction of the quadrant thence determined. I have re-reduced all these observations that I could find. There is, however, a hiatus extending from 1728 to 1756, within which an entirely independent derivation of clock-errors does not seem possible. Thus, curious though it may seem, the place of the moon is much better determined during the first quarter of the last century than during the second.

The computation of the correction of the quadrant from the sets of equal altitudes is shown in the following table, which does not seem to need any special explanation.

Investigation of Corrections to the Paris Quadrant, 1706–1758.

Date.	Clock-time of Mean of Corresponding Altitudes.	Mean Interval.	Hourly Motion of Sun's Dec.	Corr. for Motion.	Clock-time of Transit over Meridian.	Clock-time of Transit over Quadrant.	Corr. of Quadrant.	Sun's Declination.
	h m s	*h m*	″	*s*	*m s*	*m s*	*s*	° ′
1706, May 14	23 59 20.2	4 14	+ 36.4	− 8.1	59 12.1	59 42.0	− 29.9	+18 35.
Aug. 1	23 55 15.4	6 13	− 37.6	+ 9.9	55 25.3	55 59.0	− 33.7	+18 6
Sept. 19	23 58 46.0	4 54	− 58.2	+ 17.9	59 3.9	59 39.0	− 35.1	+ 1 34
Dec. 5	23 58 52.2	4 31	− 19.2	+ 7.7	58 59.9	. .	. .	−22 22
1707, April 4	23 50 26.2	4 25	+ 57.3	− 16.5	50 9.7	50 47.5	− 37.8	+ 5 32
June 19	23 55 32.2	5 35	+ 2.8	− 0.6	55 31.6	56 2.0	− 30.4	+23 26
Sept. 6	23 58 8.7	4 42	− 55.8	+ 15.8	58 24.5	59 0.8	− 36.3	+ 6 37
1708, Feb. 24	23 56 25.5	4 13	+ 44.4	− 16.6	56 8.9	56 44.0	− 35.1	−16 25
July 9	23 58 31.9	4 33	− 18.2	+ 4.3	58 36.2	59 7.2	− 31.0	+22 21
Sept. 12	23 58 26.0	4 47	− 57.4	+ 16.9	58 42.9	59 18.8	− 35.9	+ 4 4
1709, Dec. 24	23 57 20.2	4 11	+ 2.9	− 1.2	57 19.0	57 53.	− 34.0	−23 26
1710, Feb. 9	23 51 59.8	5 6	+ 48.1	− 17.8	51 42.0	52 17.0	− 35.0	−14 43
July 22	23 56 56.7	5 3	− 29.7	+ 7.0	57 3.7	57 35.0	− 31.3	+20 20
Sept. 13	23 53 51.3	4 41	− 57.5	+ 16.9	54 8.2	54 47.5	− 39.3	+ 3 52
Dec. 4	23 52 17.	4 10	− 20.3	+ 8.1	52 25.1	53 1.0	− 35.9	−22 14
1711, Sept. 15	23 50 39.5	4 16	− 57.8	+ 17.0	50 56.5	51 33.2	− 36.7	+ 3 13
1714, Mar. 16	23 57 57.2	4 44	+ 59.2	− 18.7	57 38.5	. .	. .	− 1 48
Mar. 20	23 57 9.0	6 1	+ 59.3	− 19.2	56 49.8	57 28.5	− 38.7	− 0 13
1715, May 26	0 1 32.1	4 42	+ 26.4	− 8.0	1 24.1	2 1.	− 36.9	+21 3
July 26	0 0 13.3	4 34	− 32.7	+ 7.5	0 20.8	1 0.0	− 39.2	+19 33
Sept. 16	23 56 44.5	4 27	− 57.9	+ 17.3	57 1.8	57 43.	− 41.2	+ 2 50
Nov. 3	23 59 57.9	4 5	− 47.2	+ 17.4	0 15.3	0 50.5	− 35.2	−14 56

Investigation of Corrections to the Paris Quadrant, 1706–1758—Continued.

Date.	Clock-time of Mean of Corresponding Altitudes.	Mean Interval.	Hourly Motion of Sun's Dec.	Corr. for Motion.	Clock-time of Transit over Meridian.	Clock-time of Transit over Quadrant.	Corr. of Quadrant.	Sun's Declination.
	h m s	h m	"	s	m s	m s	s	° '
1717, Sept. 20	23 55 48.7	4 20	− 58.4	+ 17.6	56 6.3	56 45.0	− 38.7	+ 1 5
Dec. 19	0 0 38.0	3 58	− 3.0	+ 1.2	0 39.2	1 12.5	− 33.3	−23 26
1718, Sept. 27	23 59 8.7	4 15	− 58.5	+ 18.2	59 26.9	0 10.5	− 43.6	− 1 34
1720, May 21	0 0 16.	4 42	+ 30.0	− 6.8	0 9.2	0 45.0	− 35.8	+20 17
May 28	23 59 4.	4 33	+ 23.8	− 5.3	58 58.7	59 35.5	− 36.8	+21 33
1727, Mar. 21	23 59 22.2	6 0	+ 59.3	− 19.2	59 3.0	59 44.2	− 41.2	+ 0 8
1728, Feb. 13	23 53 19.	4 12	+ 50.2	− 18.2	53 0.8	53 45.0	− 44.2	−13 31
Aug. 30	23 48 19.5:	2 7	− 54.0	+ 13.8	48 33.3	49 17.2	− 43.9	+ 8 52
1755, July 18	0 8 7.7	5 54	. .	+ 6.5	8 14.2	8 10.1	+ 4.1	. .
1756, Dec. 13	0 9 21.2	5 38	− 9.2	+ 3.7	9 24.9	9 31.2	− 6.3	−23 13
Dec. 17	. . . .	. .	− 4.6	. .	. .	. .	. .	−23 24
1758, Jan. 24	0 22 6.2	5 2	+ 36.4	− 14.2	21 52.0	22 2.0	− 10.0	−19 9

It will be seen that the series of occultations which we use begins nine months before the first determination of the error of the quadrant, and that, during the interval, the observers used a correction for deviation much smaller than that found from and after 1706, May 14. There is no way of determining whether there really was a change, or of deciding how the value actually used was obtained. I am strongly inclined to suspect that the value actually used was the result of some old determination, which was found to be erroneous when equal altitudes began to be regularly observed, and that the new value should be used from the beginning of the series. What has been done is to make the reductions on each hypothesis in order that the results might be compared.

The deviations of the quadrant resulting from the observations vary with the time and the declination in a manner which does not seem reducible to any exact law. I have therefore, in determining clock-corrections from the several transits, tried to execute a sort of double interpolation of the quadrant-error from observations each side of the date in time and each side of the declination in altitude. The corrections thus deduced are shown in the following table of individual clock-corrections.

Instead of discussing each clock-correction separately, as in the former series of observations, I have in this series, owing to the uniformity of the processes, collected all the individual results into a single table. Generally at least one determination is made on each side of the time of observing the occultation, and the correction for the time of observation is obtained by a simple interpolation. The table is as follows, and scarcely seems to need explanation. It may be remarked that the column "Mean Time" gives the mean tabular time of transit of the sun over the true meridian, and is simply the equation of time, subtracted from $24^h\ 0^m\ 0^s$ when negative.

The clock of which the corrections are here given was the "pendule supérieure"; most of the occultations were actually observed with another clock, designated as "pendule inférieure", which was compared with the other soon after the occultation.

Computation of Clock-corrections from Transits of the Sun observed at the Paris Observatory.

Date.	Clock-time of Transit over Quadrant.	Correction.	Transit over True Merid.	Mean Time.	Apparent Clock-correction.
	h m s	s	m s	m s	m s
1705, Aug. 3	23 58 49.5	— 13 (?)	58 36.5	5 32	+ 6 56
☽ 4	2 0 5.5	— 13	59 52	. .	. .
5	58 8.2	. .	57 55	5 27	+ 7 32
Sept. 2	23 56 33	— 21 (?)	56 12	59 24	+ 3 12
4	55 23	. .	55 2	58 46	+ 3 44
1706, Jan. 21	23 59 45	— 17 (?)	59 28	11 57	+ 12 29
24	59 18	. .	59 1	12 43	13 42
27	58 38	. .	58 21	13 23	15 2
28	58 28	. .	58 11	13 34	+ 15 23
Apr. 21	23 57 6	— 16 (?)	56 50	58 36	+ 1 46
22	56 37	. .	56 21	58 23	+ 2 2
May 24	23 56 40	— 31	56 9	56 13	+ 0 4
26	56 2	. .	55 31	56 24	+ 0 53
Nov. 16	23 59 52	— 35	59 17	45 7	— 14 10
19	59 26	. .	58 51	45 45	— 13 6
1707, Apr. 4	. . .	. .	50 9.7	3 12.4	+ 13 2.7
5	23 50 1.5	— 36.5	49 25.0	2 54	+ 13 29
Sept. 3	23 55 7	— 36	54 31	59 15	+ 4 44
5	53 44	. .	53 8	58 36	+ 5 28
1708, Feb. 23	23 57 26.5	— 35.0	56 51.5	13 57.2	+ 17 5.7
24	. . .	. .	56 8.9	13 48.4	+ 17 39.5
Sept. 5	23 56 26.5	— 37.0	55 49.5	58 21.5	+ 2 32
7	54 31.5	. .	53 54.5	57 41.8	+ 3 47
1709, Apr. 20	23 54 27	— 36	53 51	58 46	+ 4 55
21	53 50	. .	53 14	58 32	+ 5 18
Sept. 13	23 52 17.5	— 35	51 42	55 44.1	+ 4 2
14	51 23.0	. .	50 48	55 23.4	4 35
15	50 26.0	. .	49 51	55 2.5	5 11
16	49 31.5	. .	48 56.5	54 41.7	5 45
☽ 16	10 25 5	. .	24 30	30 33	+ 6 3
20	23 59 32	. .	58 57	53 18	— 5 39
23	56 50	. .	56 15	52 17	— 3 58
1710, Dec. 4	. . .	. .	52 25	50 38.5	— 1 46.5
5	23 52 59	— 36	52 23	51 3.4	— 1 19.6
1711, Sept. 29	23 55 21	— 37	54 44	50 26	— 4 18
☽ 30.6	14 54 23	. .	53 46	50 14	3 32
Oct. 2	53 0.5	. .	52 23	49 29	— 2 54

Computation of Clock-corrections, etc.—Continued.

Date.	Clock-time of Transit over Quadrant.			Correction.	Transit over True Merid.		Mean Time.		Apparent Clock-correction.	
	h	*m*	*s*	*s*	*m*	*s*	*m*	*s*	*m*	*s*
1712, May 15	0	2	4	− 33	1	31	55	52	− 5	39
17		2	37	. .	2	4	55	54	− 6	10
1714, Mar. 21	23	57	16	− 39	56	37	7	28	+ 10	51
22		57	5	. .	56	26	7	10	+ 10	44
Apr. 6	0	0	38	− 39	59	59	2	31	+ 2	32
8		0	11	. .	59	32	1	56	+ 2	24
1715, July 21	0	0	45	− 38	0	7	5	44	+ 5	37
22		0	48	. .	0	10	5	48	+ 5	38
Aug. 9	0	0	16	− 40	59	36	5	4	+ 5	28
10		0	7	. .	59	27	4	56	5	29
16	23	58	57	. .	58	17	3	56	+ 5	39
Oct. 7	23	58	18.5	− 39.5	57	39	47	59	− 9	40
10		58	34.5	. .	57	55	47	10	− 10	45
Dec. 23	0	1	27	− 34	0	53	59	30	− 1	23
30		4	37	. .	4	3	2	58	− 1	5
1716, Jan. 7	0	7	59	− 34	7	25	6	41	− 0	44
1717, Sept. 25	23	58	45.5	− 39.0	58	6.5	51	34.6	− 6	32
26		58	21.2	. .	57	42.2	51	14.6	− 6	28
1718, Sept. 8	0	1	24	− 41	0	43	57	30.8	− 3	12
10		0	34	. .	59	53	56	50.2	− 3	3
1719, Apr. 22	23	58	49.5	− 41.5	58	8	58	25.8	+ 0	18
23		58	27.5	. .	57	46	58	13.1	+ 0	27
Oct. 29	0	0	50	− 40:	0	10	43	58	− 16	12
30		0	33	. .	59	53	43	55	− 15	58
Nov. 26	23	58	32	− 37:	57	55	47	37	− 10	18
27		58	38	. .	58	1	47	57	− 10	4
1720, Apr. 16	23	59	52	− 40	59	12	59	38	+ 0	26
20		58	7	. .	57	27	58	42	1	15
23		56	51	. .	56	11	58	4	+ 1	53
1727, Sept. 6	23	48	44	− 42	48	2	58	15	+ 10	13
8		47	13	. .	46	31	57	35	+ 11	4
1738, Jan. 2	0	4	52	+ 2	4	54	4	40	− 0	14
3		5	46.5	. .	5	48.5	5	7.8	− 0	41
Dec. 23	0	16	18.5	. .	16	20.5	59	39.2	− 16	41
24		16	54	. .	16	54	0	9.3	− 16	45
1739, Feb. 13	.	.	.	. .	4	57.3	14	43.6	+ 9	46.3
16	0	4	58.7	+ 1.5	5	0.2	14	34.9	+ 9	34.7

More observations, from the anonymous registers, accidentally omitted before:—

Occultation of Jupiter, July 27, 1704.

$1^h\ 22'\ 34''$ on juge qu'il touchoit par la lunette de 8.
1 22 40 il commença à toucher le bord de l'☽ par la lunette de 18 pieds.
1 24 3 je crois l'avoir perdu de vue.
2 6 26 ♃ est sort à moitié.
2 7 12 ♃ tout sort.

Transits of ⊙, etc.

		I.	II.	C.	Midy.
July 25	⊙ tr.	11 58 55½	1′ 11″	12 0 3¼	11 59 52
26		58 52	1 8	12 0 0	59 48
27		58 48	1 2	11 59 55	59 43
28		58 40½	0 55	59 47¾	. .
29		58 38	0 52	59 45	59 33

He applies a correction of $-12''$ for instrument, but I cannot find on what this correction depends. I find no data for such a correction till December 30, a. m., when we find:—

8 2 27, haut du bord sup. du soleil par M. d. C. 1° 7′ 0″.
8 6 39, le bord inf. à la mesme hauteur.
Thermometer 25. Bar. 277½.

By rough examination of the temperature at different seasons, the thermometer seems to be that of Fahrenheit. The observed transits of ⊙ are:—

	Cent.	Midy.	
Dec. 25	0 4 7.3	0 3 50.3	So it seems he now applies -17^s for error of instrument.
30	0 5 4.5	0 4 47.5	

If this observation is worth reducing, it is rather to be used for determining the position of Jupiter than that of the moon. The observed altitude of the sun gives a clock-correction of $-1^m\ 41^s$, which is entirely incompatible with that derived from the transits. The only course seems to be to accept the times of apparent noon given by the observers, and correct the clocks accordingly. The apparent times, deduced by applying a clock-correction of $+17^s$, are given in the Memoirs of the Academy for 1704, page 233.

1705, Aug. 5. (Aug. 4.6, astron. time.)

$3^h\ 16'\ 40''$ Immersion de l'étoile dans la lune par la lunette de 17 pieds. Je n'ay
Add 1 52 pas pu voir avec la lunette de 11 pieds.
3 18 32

9 5 0 pend. sup. } 6^h after the occultation.
9 5 8 pend. inf. }
0 8

Aug. 2	⊙ tr. 11 58 0″½	0′ 15″	. . . . . 11 59 8	
			13	
			11 58 55	midy.
3	⊙ tr. 11 57 43	59 56	. . . . . 11 58 49½	
			13	
			11 58 36½	midy.
4	. . . .		. . . . . 11 58 16	midy (couvert).

|☾ 11 58 50 ☽| 1 21
5 11 57 1½ 59 15 . . . . . . 11 58 8
13
11 57 55
6 11 56 41 58 54 . . . . . . 11 57 47
16
11 57 31

No altitudes; no telling how quadrant was corrected.

The interval of six hours between the observation and the comparison of clocks renders the time more uncertain than usual, the difference -8^s being assumed constant for this time. The transit of the moon might be utilized for the clock-correction, but has not been. The results for local mean time of occultation will be:—

Using CASSINI's correction of quadrant, Aug. 4, $15^h\ 23^m\ 58^s$
Using -35^s . . . . $15^h\ 24^m\ 20^s$

1705, Sept. 2.

11 46 15 horl. inf. l'étoile τ de la 5e grandeur dans la jambe oriental du Verseau entre dans la partie obscure de la lune.

0 47 37 l'étoile sort.
0 51 0 l'horl. sup.
0 51 39 l'horl. inf.

Sept. 1 ⊙ tr. 11 56 0 58 12 11 57 6
20
11 56 46 midy.
2 ⊙ tr. 11 55 28 57 38 11 56 33
21
11 56 12 midy.

2 0 pendule sup.
2 38 pendule inf.
0 38

Sept. 4 ⊙ tr. 11 54 18 56 29.

The hour of the last clock-comparison cannot be determined.

1706, Jan. 23, p. m.

11 0 14 l'étoile entre dans la partie obscure de la lune par la lunette de 17 et par cette de 11 p.
22 36 l'étoile entre par la lunette de 11 p.
23 19 par cette de 17.
11 32 29 l'étoile petite qui est entrée la derrière sort de la lune 17 p.
32 34 par la lunette de 12 p.
11 38 8 pendule inf.
38 0 pendule sup.

Les observations précédentes de la ☽ ont esté faites à la pendule inf.

Jan. 27½, 1706.

12 21 3 l'étoile λ, entre dans la lune du coté de la partie obscure.
12 25 22 pend. inf.
12 21 0 pend. supr.

		I.	II.	
1706, Jan. 21	⊙ tr.	11 58 36	0 54	11 59 45
				17
				11 59 28 midy.
24		58 8½	0 28	
26	☾ tr.	10 22 45	25 4	
27	⊙	11 57 28	59 49	
	☾	11 17 8	19 27	
28		11 57 19	59 38	11 58 29
				17
				11 58 12 midy.

On January 23, the first immersion is of κ^1 Tauri; the next two appear to be two observations of the immersion of κ^2 Tauri. All the observations are, however, discordant in a way which gives rise to the suspicion that an error of 3^m was made in the comparison of clocks.

1706, April 21. Occultation of η Leonis.

8 59 15 Immersion de l'étoile derrière la lune supr. pend.
9 1 45 Immersion de l'étoile η dans le col du Lion avec une lunette de 3 pieds . . . pend. inf.
9 1 47 avec une lunette de 2 pieds.
9 2 0 pendule supr.
9 4 28 pendule infr.
9 55 20 Emersion de l'étoile η de la lune par la lunette de 16 pieds exacte, pendule inf.

L'étoile en entrant dans la lune m'a paru s'allonger estant vue dans l'axe de la lunette de 16. pieds.

Avril 19	⊙ tr.	11 57 12 (sic).	59 12 (sic).	
20		56 31	58 41	
21		56 1	58 12	
22		55 32	57 43	
23		55 3	57 14	
May 11		11 57 38	59 52	2′ ajouté.
12		59 14	1 30	
14		58 35	0 49	
15		—	0 31	

Altitudes of ⊙, May 14.

9h 47′ 45″	2h 12′ 11″	50° 0′	0 4 0 pend. sup.
50 16	9 36	50 20	0 4 37 pend. inf.
52 50	7 1	50 40	
55 29	4 30	51 0	
58 8	1 46	51 20	

9 47 45
14 12 11
4 24 26
2 12 13
11 59 58
8
11 59 50 midy à la pendule inf.
37
11 59 13 midy à la pendule supr.
11 59 42
0 29 déclinaison de l'instr.
May 14 11 59 42
15
11 59 27 midy.

This calculation refers to the transit of May 14.

1706, May 24.

10 51 29 L'étoile entre dans le bord de la ☽. La lune se couvre l'étoile.
11 3 53 pend. inf. 10 51 39 (sic)
11 0 0 pend. supr. 3 53

10 47 46
3 48

10 51 34

Transits and calculations for clock.

		|(				
May 23	⊙	11° 55′ 50″		58′ 6″	56′ 58″	
24	⊙	55 32		57 49	56 40—20	56 20 midy.
24	|☾	9 52 41				3 40
	L'étoile	9 55 39				
25	|☾	10 34 43	☽|	10 36 49		9 55 39
26	○|	11 57 10				20
		1 8				
		11 56 2				9 55 19
		20				3 48
		11 55 42				9 59 7
Aug. 1	⊙	11 54 52		57′ 6″		

11 59 30 pend. supr.
11 44 5 pend. infr.
15 25

8 26 30
2 53 11

6 26 41
3 13 20½
11 39 50½
10

11 40 0½
15 25

11 55 25 midy à la supr.
11 55 59

34 déclinaison.

Altitudes ⊙ Aug. 1.

8 26 30	2 53 11	40 50
28 38	51 4	41 10
33 2	46 38	41 50
35 8	44 32	42 10

1706, Nov. 18 a. m., 17½ ast. time.

0 11 59 pend. inf. L'étoile se cache de derrière la ☽ en ligne droite avec Copernic et . . .
0 17 30 pendule sup.
0 18 25 pendule inf.

0 55

Nov. 16	⊙ tr.	11 58 43	1′ 1″		11 59 52
					30
					11 59 22
17	|☾	9 52 25	54 35	le vent.	
19	⊙	11 58 17			11 59 26
					34
					11 58 52 midy.

Sept. 19	11 58 35	0 43	11 59 39	
			11 59 4	from alt.
			35	decl.
Alt. ⊙ Sept. 19, 1706.	9 27 24	2 30 6	33 0	
	31 40	25 53	33 30	
	35 57	21 36	34 0	
Dec. 5, 1706.	9 39 40	2 18 3	12 40	
	43 35	14 13	13 0	
	47 23	10 19	13 20	

1707, April 4.

8^h 8′ 1″ pendule supr. La petite étoile ρ d'Aries est cachée par le bord obscure de la lune.

add 10 6

9 7 41 pend. inf.
8 54 0 pend. sup.

13 41

Apr. 1		51 51½	54 1
3	⊙ tr.	11 50 28½	52 48
4		49 43	51 52
5		48 57	51 6

Apr. 4. Alt. ⊙.

9 33 11	2 7 41	38 10	9 33 11
36 7 dub.	4 49	38 30	2 7 41
38 59	1 53	38 50	4 34 30
41 57	1 58 56	39 10	2 17 15
			11 50 26
			16
			11 50 10
			11 50 47½
			37 diff. declinatic.

1707, June 18	⊙	11 55 8	57 25	56 16½
19		54 53	57 11	56 2
20		54 37	56 55	55 46

June 19. Altitude ⊙.

9 2 37	48 26	48 0
4 48	46 17	48 20
7 0	44 5	48 40
9 11	41 54	49 0
11 23	39 41	49 20
13 36	37 29	49 40

From all which he seems to deduce a correction of — 30″ for his instruments.

1707, Sept. 3. Occultation of Antares.

7^h 45′ Antares entre dans la partie obscure de la lune pend. inf. Cette immersion n'a été observée qu'a quelques secondes près.

8 33 11 Antares sort de la partie claire de la lune par la lunette de Campani, exacte.

Then come the following calculations:

8^h 50′	l'horl. sup.	7^h 45′	8 33 11
8 52 57	l'horl. inf.	5 30½	5 30
		13½	15
		7 50 44	8 38 56½
		2 57 à retr.	2 57 à retr.

7 47 47 heure vér. de l'imm. d'Antares.
8 36 0 heure vérit. de l'émers.

Transits of ⊙.

Aug. 29	11 57 25	59 34	58 29.5
30		58 55	
31		58 18	
Sept. 1		57 36	
3	11 54 3	56 12	55 7½
5	58 40	0 48	59 44
6	57 56½	0 5	59 0.8
7	57 12	59 20	58 16

Altitudes ⊙ Sept. 6.

9 31 23	38 0	2 24 58
34 9	38 20	22 11
36 48	38 40	19 28
39 37	39 0	16 38
42 26	39 20	13 49

No statement when the clock was put forward.

The authors of this "register" sometimes failed to apply any correction for motion of the sun to their corresponding altitudes.

The clock seems to have been put forward six minutes before the transit of the sun on September 5. Subtracting this, the clock-corrections from the transits are:—

	Sept. 3.	Sept. 5.
Clock-times of transit by quadrant . .	$23^h\ 55^m\ 7\frac{1}{2}^s$	$23^h\ 53^m\ 44^s$
Corrections of quadrant	$-\ 36\frac{1}{2}^s$	$-\ 37^s$
Clock-times of true transit	$23^h\ 54^m\ 31^s$	$23^h\ 53^m\ 7^s$
Mean times	$23^h\ 59^m\ 15^s$	$58^m\ 36^s$
Clock-corrections	$+\ 4^m\ 44^s$	$+\ 5^m\ 29^s$

Subtracting $2^m\ 57^s$ for reduction from one clock to the other, the times of the phases are:—

	Immersion.	Emersion.
Clock-times of occultation of Antares, 1707, Sept. 3,	$7^h\ 42^m\ 3^s$:	$8^h\ 30^m\ 14^s$
Clock-corrections	$+\ 4^m\ 51^s$	$+\ 4^m\ 52^s$
Paris mean times	$7^h\ 46^m\ 54^s$:	$8^h\ 35^m\ 6^s$
Greenwich mean times	$7^h\ 37^m\ 33^s$:	$8^h\ 25^m\ 45^s$

The first time may be considered as affected with a probable error of at least 10^s.

1708, Feb. 23, p. m. Occultation of Venus.

7 0 31 ♀ commence à entrer à la pend. inf. Lunette de 34.
0 46 Elle entre entièrement dans la lune.
7 0 23 ♀ commence à toucher la lune par la lunette de 34.
0 38 Vénus entre entièrement à la lunette de 34 et de 12 pieds.
add 3′ 19″
7 16 0 pend. supr.
7 16 9 pend. inf.
———
9

Feb. 21	⊙ tr.	11 57 45	59 57
22		57 4	59 15
23		56 20	58 33
24		55 38	57 50
25		54 49	57 1

Feb. 24. Alt. ⊙.

9ʰ 42′ 45″	10′ 6″	24° 50′
46 8	6 39	25 10
49 42	3 13	25 30
53 16	59 35	25 50
56 53	1 55 17	26 10

1708, Sept. 6.

9 32 51	Emersion de χ Taureau de la partie obscure de la lune.
10 7 0	pendule inf.
10 7 0	pendule supr.
0 0 0	

Sept. 3	⊙ tr.	11 57 15	59 24	11 58 19½	
				34	
				11 57 45	midy.
4		11 56 19	58 29	11 57 24	
				34	
				11 56 50	midy.
5		11 55 22	57 31	11 56 26	
				34	
				11 55 52	midy.
7 a. m.	☽| cent.	5 14 23½	15 42½		
7	⊙ tr.	11 53 27	55 36	11 54 31½	
				34	
				11 53 57½	
July 9	⊙ tr	11 57 58½	0 16		
Sept. 12		11 58 14½	0 23		

1708, July 9. Alt. ⊙.

9^h 37′ 4″	19′ 57″	51° 50′	11 58 31½	
39 27	17 36	52 10	7	
41 51	15 13	52 30		
44 17	12 50	52 50	11 58 38½	
46 41	2 10 23	53 10	11 59 6¾	
			28	decl. ad. occid.

Sept. 12.

9 30 52	26 0	35 40
33 48	23 13	36 0
40 38	2 16 5	36 50
43 33		37 10
46 31		37 30½
49 29		37 50
52 35		38 10
55 38		38 30

1709, April 20.

7^h 52′ 49″ Immersion dans la lune de l'étoile τ de la Lion. Pend. infér.

				Apr. 19, a. m.	
10 18 30	pend. inf.	10 51 31	pend. inf.	4 30 10	p. inf.
10 11 0	pend. supr.	44 0	pend. supr.	4 24 0	p. sup.
7 30		7 31		6 10	
				5 2	
				1 8	

		|(	)|		
Apr. 17	⊙ tr.	11 55 19	57 29		
18		—	56 51	11 55 46	
19			56 11	32	
				11 55 14	
20		11 53 22	55 33	11 54 28	
21		11 52 45	54 55	32	
				11 53 56	midy.
23		11 51 34	53 45	11 52 39	
				32	
				11 52 7	
				30	
				11 51 37	

1709, September 17 (or 16½ probably).

0h 6′ 33″ à l'horl. inf. Immersion de l'étoile σ de la 5e grandeur dans la partie obscure de la lune. Elle étoit en ligne droit avec Hélion et Timarchus.

0 23 51	l'horl. inf.
0 13 0	l'horl. sup.
10 51	

1709, Dec. 24.

9 45 44		12° 20′
49 47	2 4′ 50″	12 40
53 59	0 43	13 0
58 15	56 27	13 20

Sept. 15	⊙ tr.	11 49 22	51 30	
16		11 48 27	50 36	
13		51 13	53 22	
14		—	52 27	
16	|☾	10 24 3	26 2	(Chord qui manque.)

La pendule supérieure s'est arestée.

	☽|		
Dec. 24	11 59 4		11 57 53
			57 21
			32 decl.
1710, Feb. 9	11 51 10	53 24	11 52 17
July 22	11 56 27	58 43	11 57 35
			11 57 3
			32

1710, Feb. 9.

9 14 13	29 47	17° 50′
17 25	26 33	18 10
20 37	23 23	18 30
23 54	2 20 6	18 50

1710, July 22.

9 16 19	37 34	47 30
20 51	33 0	48 20
25 32	28 23	48 50
30 14	23 39	49 30
35 0	2 18 55	50 10

1709, Sept. 23. Occultation of Pleiades.

8 24 52	Maia entre dans la lune, lunette de 17 p.	pend. infér.
28 53	Taigeta entre lunette de 34 pieds.	
28 54	Taigeta entre lunette de 17 p.	
8 38 34	pendule inf.	
36 0	pendule supr.	
2 34		
8 47 44	L'étoile marquée χ entre	lunette de 17 p. pend. inf.
9 11 51	L'étoile χ sort	
9 14 24	Maia sort	

Sept. 20	⊙ tr.	11 58 28	0′ 36″	11 56 50	
23		11 55 46	57 54	34	
				11 56 16	midy le 22d.

1710, Dec. 4. Occ. Pleiades.

4 50 12 Electra entre dans la lune.
7 36 retard horl. sup. ab. hor. var.?
6 12
―――
1 24 add.

5 48 22 L'étoile proche d'Asterope cache par la grande lunette.
5 56 58 Asterope entre dans la lune par la grande lunette.
6 9 50 ✱ sort.
23 28 Maia sort par le g. lunette.
―――
6 59 9 pend. inf.
53 0 pend. supr.
―――
6 9

Dec. 2	⊙ tr.	11 51 59	54 21	
3	" "	11 51 55	54 16	
3	|("	9 56 58	59 4	
4	⊙ "	11 51 50	54 12	
4	|("	4 59 45	5 1 58	
5	⊙ "	11 51 53	54 5	
Sept. 13		11 53 43	55 52	*D*, − 39ˢ

Alt. ⊙ Sept. 13.

9 29 6	18 41	35° 50′
31 54	15 48	36 10
34 45	12 51	36 30
37 41	10 4	36 50

Dec. 4.

9 47 32	1 57 2	14° 0′
51 44	—	14 20

11 52 17 + 8 = 11 52 25

1711, Oct. 1. Occ. Pleiades (Oct. 0.6 astron. time).

3 40 11 Maia est cachée par la lune . . . . 46′ 40″
add 6′ 29″
48 10 Taigeta est cachée par la lune 54 39
4 50 55 Alcione est cachée par le bord clair de la lune . . . 57 26
6 31
4 56 18 Maia sort 5 2 49
5 34 23 Alcione sort 40 55
6 32

Sept. 27	⊙ tr.	11 55 53	58′ 3″
28		11 55 5	57 16
29		—	56 26
Oct. 0.6	Le ventre de la ☽	2 53 30	
	☽|		55 26
Oct. 2		11 51 56	54 5
Sept. 15		11 50 28½	52 38

Alt. ⊙ Sept. 15.

9 36 52	2 4 26	36° 30′	
40 0	1 24	36 50	
42 53	58 28	37 10	Corr. + 17.
45 59	55 19	37 30	
49 9	1 52 5	37 50	

Oct. 2 11 53 0
32
―――
11 52 28 midy.

He seems to have used the same clock with which the transits of the ⊙ are observed.

1712, May 15½.

11 22 2 Immersion dans la partie obscure de la lune du ε Lion. Pend. inf.
Auf. 25″
0 1 15 Emersion de la partie claire.
11 26 2 pend. inf.
11 27 0 pend. sup.

		|(	)|	
May 13	⊙ tr.	0 0 29	2 42	0 2 4
15		0 0 57	3 11	32
17		—	3 44	———
18		0 1 45	4 0	0 1 32

"Le 19 May à 5^{h} du matin Mad. Cassini est accouchée d'une fille qui a été baptisée le 27 et nommée Susanne Françoise", which perhaps accounts for our having no corresponding altitudes since last September.

1714, Jan. 19, p. m.

5^{h} 46′ 18″ pend. inf. Immersion dans la partie obscure de la lune d'une étoile des Poissons.
6 34 0 l'étoile sort de la partie claire de la lune.
55 10 une autre étoile, beaucoup plus petite, entre dans la partie obscure de la lune vers son bord sept. qu'elle rase presque.

1714, Mar. 21.

10 14 41 pend. sup. une étoile o (Tauri, cornu) entre dans la ☽.
3 28
———
10 18 9

			Corr.	⊙ Alt. Mar. 16.		
Mar. 19	11 56 36	58′ 46″	−38″	9 27 21	28 27	30 10
20	56 24	58 33	−38	34.44	21 7	31 0
21	56 11	58 20½	−39	39 26	16 35	31 30
22	56 0	58 10		43 55	2 12 3	32 0
					Mar. 20.	
				8 55 36	2 58 42	27 40
				58 10	2 56 8	28 0

1714, Apr. 7, a. m. (6.6 ast.).

3 24 11 Immersion of ξ Sagittarii (bright limb) pend. supr.
or 3 24 12
add 9″
4 37 27 L'étoile sort de la partie obscure.
add 10″

		|(				
Apr. 5	⊙ tr.	11 52 46		(+ 1′ 6″) (cl. adv. 7′)		
6			0 1 43	(− 1′ 5″)	Apr. 10, ⊙ limb. supr.	
8		11 59 6½	61 15		6^{h} 14′ 14″	4° 0′ 0
					17 26	3 30
9		11 58 56	—		20 40	3 0
					23 55	2 30
10			60 52		27 15	2 0
					30 27	1 30
11		11 58 32	60 42		34 8	1 0

At noon, T. 54°.1; barom. 27 11¾.

1715, July 22, a. m., Occ. of q (?) Piscium (21.6 ast. time).

2^h $53'$ $26''$ Immersion en la bord claire.

auf. $0'$ $9''$

2 53 17

3 46 13 J'ay commencé de voir l'émersion de l'étoile obscure. L'étoile étoit encore assez sensible quoiqu'il fit grand jour.

3 46 4

					⊙ Alt. May 26.	
May 26		0^h $0'$ $53''$	☾			
July 20	⊙ tr.	11 59 33	1 48	9 36 56	26 9	50 20
21		59 37	—	39 17	23 46	50 40
22		59 40	1 56	41 42	2 21 22	51 0
				44 9	18 56	51 20

1715, Aug. 15 (+ ½ ast.).

			⊙ Alt. July 26, 1715.	
11 54 29	l'étoile χ du Verseau entre dans la lune.	9 39 27	20 59	49° 40′
		43 7	17 19	50 10
sub. 2′ 37 11 58 12	pend. inf.	46 51	2 13 37	50 40
11 54 0	pend. sup.			
0 39 36	émersion de l'étoile χ.			

					Sept. 16.	
July 26	⊙ tr.	11^h $59'$ $52''\frac{1}{2}$	$2'$ $7''\frac{1}{2}$	9 34 42	18 55	35 10
Aug. 9		11 59 10	1 22	38 51	14 36	35 40
10		11 59 1	—	43 13	10 11	36 10
16		11 57 51	60 3	47 49	5 39	36 40
Sept. 15		11 57 1	59 8	52 29	1 0	37 10
16		11 36 39	—			
17		—	11 58 26			

1715, Oct. 9, p. m.

8^h $17'$ $2''$ l'étoile venoit d'entrer dans le bord obsc. de la lune. Pend. inf. Lunette de 17 p.

8 24 22 pend. inf.

8 23 0 pend. sup.

1 22

					⊙ Alt. Nov. 3.	
Oct. 6	⊙ tr	—	60 37	9 50 44	9 23	20 20
7		11 58 14	—	9 56 10	2 3 43	20 50
10		11 57 30	59 39	10 0 0	59 51	21 10
Nov. 3		11 59 43	1 58	4 2	1 55 51	21 30

Dec. 30, p. m.

7^h $28'$ $1''$ pend. sup. Immersion de l'étoile χ du Verseau.

7 23 37 pend. inf. Immersion de l'étoile χ.

7 25 39 pend. inf.

7 30 0 pend. sup.

Dec. 23	⊙ tr.	0 0 15	2 39
30		0 3 26½	5 48
1716, Jan. 7		0 6 48	—
10		0 7 59	10 20

1717, Sept. 25. Occult. of Aldebaran, à la pendule inférieure.

9 13 46 Aldebaran est caché par la lune.

sub. 2′ 14½″

9 20 18 pendule inférieure. 10 52 21 signal pend. inf.

9 16 0 pendule supérieure. 10 48 0 pend. sup.

4 18

auf. 2′ 16″

10 6 9 Aldebaran sort du bord obscure tout d'un coup.

Sept. 24	⊙ tr.	11 58 2	—	corr.	$-41''$
25		11 57 41	59 50		$-41''$
26		11 57 17½	59 25		
Dec. 19		0 0 1	2 24		
Sept. 20		11 55 41	57 49		

1717, Dec. 19, Alt. ⊙.

9 53 7		12 40
57 26	$3'$ $55''$	13 0
10 1 38	59 36	13 20
6 4	1 55 9	13 40

1717, Sept. 20.

9 41 23	10 13	34 30
44 31	7 10	34 50
48 6 dub.	4 1	35 10
50 44	0 51	35 30

No records for the first five months of 1718.

1719, April 22, p. m.

7 42 37 Immersion d'Aldebaran dans la lune à la vue et en mesme temps avec la lunette.
add 1 55

7 44 32

8 32 11 Aldebaran sort du bord clair de la lune.
1 56

8 34 7

8 34 58 Aldebaran sort et on l'apperçoit dans l'instant.

8 37 0 la pendule.

8 39 52 pend. inf.

2 52

1718, Sept. 26	⊙ tr.	59 29	1 38		
27		59 6	1 15		
28		58 39	0 48		
1719, Apr. 22		11 57 44	59 55	corr.	-42^s
23		57 22	59 33		-41

⊙ Alt. Sept. 27, 1718.

9 48 19	2 9 58	32° $30'$
51 31	6 46	32 50
54 45	3 33	33 10

1719, Oct. 30, Occ. of Aldebaran.

9 58 57 à la pendule sup. Aldebaran sort du bord obscure.

add 0′ 13″

		|(			
1719, Oct. 29	⊙ tr.	11 59 43	$1'$ $57''$	0 0 50	
30			1 40	40	
Nov. 3	☽ (?)	0 30 0	32 13		
6		11 57 59	0 15	0 0 10	midy.

Nov. 3 8 3 58 — du Verseau au fixe.

Nov. 26 7 14 30 l'étoile γ entre dans le disque de la lune claire l. 7½ p.

7 14 54 l'étoile γ entre dans la lune par la lunette de 17 p. après avoir paru quelques seconds sur le bord.

7 18 1 pend. inf.

18 0 pend. sup.

	|(	)|
1709, Nov. 24	$11^h\ 57'\ 13''$	$59'$ 32
25	—	59 36
26	57 22	59 42
27	57 28	—

1720, May 21, Alt. ⊙.

9 31 57		49 10
35 31		49 40
39 4	2 21 28	50 10
42 41		50 40

1720, April 21, a. m. (20.5 ast.).

0 22 14	pend. inf.	Imm. γ^1 Virginis.
0 22 44		Em. de γ^2 Virginis.
0 48 16	Emersion des deux étoiles du bord clair.	

1720, May 28.

9 42 34 op.	2 15 34 op.	51 50
46 14 op.	—	52 20
49 32	—	52 49 30
53 35	—	53 19 20

0 25 48 pend. inf.
0 26 0
————
0 12
0 55 49 pend. inf.
0 56 0
————
0 11

Apr. 16	⊙ tr.	11 58 46	0 57
20		—	59 12
23		11 55 $45\frac{1}{2}$	57 56 c,—42″
May 19		11 59 2	1 $17\frac{1}{2}$—j'a jouté 1′ à la pendule.
21		59 37	1 53
28		58 28	0 43

1718, Sept. 9.

$8^h\ 45'\ 44''$ L'étoile disparoit au bord de la lune—pend. sup. de la tour.
auf. 9″
10 9 33 pendule inf. de la tour.
10 9 0 pendule sup. de la tour.
————
33

Dans la tour inférieure. (La pendule retardoit de une minute 6 secondes à l'égard de celle de la tour sup.)

8 46 30 Une étoile des Poissons s'éclipse.
aus 43″

(I see nothing to reconcile the discrepancies between the clocks. Here is everything:—)

Sept. 7	⊙ tr.	11 54 $46\frac{1}{2}$	56 $57\frac{1}{2}$	
8		54 19	56 29	J'ajoute 6′.
10		11 59 30	1 38	

There was considerable difficulty in reducing these observations, but I think I have completely surmounted it. From the Memoirs of the Academy, 1718, it would seem that the first of the above observations is that of MARALDI, who gives $8^h\ 45^m\ 35^s$ for the apparent time, and hence must have applied -9^s for clock. It would, therefore, seem that this "pend. sup. de la tour" is the clock with which the sun's transit is regularly observed, the correction of which, on mean time, is $-3^m\ 6^s$. We have, therefore, $8^h\ 42^m\ 38^s$ for the mean time of occultation from MARALDI's observation. The equation of time being $-2\ \ 57^s$, this result agrees exactly with MARALDI's as published.

The lower clock used by CASSINI being 33^s ahead of the upper one, its correction on apparent time would be -42^s. He writes 43^s, so that this hypothesis is probably correct. But he actually applies 50^s, seemingly out of carelessness with regard to the units of seconds, and thus obtains his printed result $8^h\ 45^m\ 40^s$. Supposing, then, a difference of 33^s between the clocks, the correction on mean time would be $-3^m\ 39^s$, and the mean time of occultation would be $8^h\ 42^m\ 51^s$. The occultation was observed also by LA HIRE, and the three results are:—

MARALDI	$8^h\ 42^m\ 38^s$.
LA HIRE	$8^h\ 42^m\ 44^s.1$
CASSINI	$8^h\ 42^m\ 51^s$.

I am inclined, under these circumstances, to use LA HIRE's observation only. The moon was totally eclipsed, and the occultation took place at a considerable angle, so that the results with respect to the phase of the moon are not so discordant as the times would indicate.

1727, Sept. 7. Occultation of Pleiades.

$2^h\ 3'\ 7''$	L'ét. des Pleiades entre dans le bord clair avec une l. d. 15 p.		
2 3 4	avec la lunette de Angleterre.		
3 5	" " " 6½ p.		
2 8 56	L'ét. des Pleiades. On n'a pas pû la voir avec les 2 autres lunettes.		
2 41 50	L'ét. la plus septentrionale entre		
47 ou 48	par la lunette de Angleterre.		
2 44 1	L'ét. la plus mérid. entre.		
2 44 0	Lunette de Angleterre.	2 48 13	pend. inf.
		2 36 0	
2 43 58	par la lunette de 6½ p.		
3 11 58	Emersion de l'étoile que je crois la 1^{er}.		
22 22	Emersion de celle que je crois la 2^e.		
37 40	Emersion de celle que je crois la 4^e.	4 11 12	pend. inf.
4 2 20	Emersion de celle qui est la plus méridionale.	3 59 0	p. sup.

1727, Mar. 19	⊙ tr.	11 48 27	50′ 36 aj. 12 à la p.		1727, Mar. 21. Alt. ⊙.		
20		59 31	1 42	8 53 8	27 20	3 5 37	11 59 22½
21		58 39½	0 49	58 7	28 0	0 37	18⅚
23		—	59 6½	0 42	28 20	2 58 4	———
Sept. 5		11 48 15¾	50 25	5 48	29 0	52 55	11 59 $3\frac{5}{12}$
6		47 39	—				11 59 44¼
8		46 9	48 57*				———
11		43 46⅓	45 55			Decl.	$40\frac{10}{12}$
1728, Feb. 13		11 52 38	54 52				
Aug. 30		12 48 12½	50 22		1728, Feb. 13.		
				9 47 0	1 59 38		22° 0′
					1728, Aug. 30.		
				10 30 24½	47 45		0 57 16:
				42 50½	48 0	Un peu à gauche du centre.	
				46 46½	48 15		
				50 46	48 30		0 45 52:

The following table is given on the first page of volume 36, which contains the observations of 1732–33. It seems to be derived principally from observations in 1733 not found in the record, but this is not certain. I give the table in the order in which it is found.

Déclinaison du quart du circle fixe qui est dans la tour occidentale sup. à l'égard de la méridienne.

Hauteurs.			
18°	40	sec. al. occ.	These first four in a different handwriting from the others.
19	40½		
20	40½		
21	42		
24 50′	43		
55	44		
54 54	43		
38	43		
33 37	43		
23 54	41		
10 13	41		
18	40		
18	39¼		
18	38½		
30	42		

If this table refers to the instrument with which the sun's transits were commonly observed, the numbers would seem to be too great for use in previous years. But it confirms the suspicion of an increase in the error of the quadrant.

1738, Jan. 2. Occultation of Aldebaran.

9 45 7 ou 8, clock. Aldebaran entre—partie obscure 9 39 51 app. time.
5 16 sub.
11 6 24 Aldebaran sort. 11 1 6 app. time.

Jan. 1	⊙ tr.	0 2 46½	5′ 9″	4 52″	Midy à la pendule.
2		0 3 41	—	4·54	Midy vray.
3		0 4 36	6 57	5 46½	Midy pend. inf.
				10 37	
Jan. 2	☽ I	9 29 54½			
		1 4½		16 23½	
				2	
		9 30 0			
Aldebaran tr.		9 32 14	5 13 subtr.	16 25½	Midy. pend. sup.

1738, Dec. 23. Occult. of Aldebaran.

5 50 35	Immersion partie obscure.	Dec. 19	⊙ tr.	0h 12′ 53″	15′ 15″½
16 28½		20	⊙	0 13 27	15 49
5 34 6½	Immersion heure vraye.	23	⊙	15 7½	17 29½
			Aldeb.	10 28 51	
6 50 36	Emersion.		☽	10 34 0	
—16 30					
		24	⊙	0 15 41	18 3
6 34 6	Emersion heure vraye.				

A great gnomon was established in the year 1729, and it may be that the transits of the sun were observed over it after that date, but I am by no means sure. A correction of + 2^s is, however, applied for error of meridian, and it seems to be well determined, though I do not know how.

1739, Feb. 15 6 50 32 Imm. of *ο* Tauri Clock 5′ 1″ App. time 6 45 31
Feb. 13 noon by 5 good corresp. altitudes . . . . 0° 4′ 57″.3
16 per gnomon, uncorrected . . . . . . 0 4 58.7 Corrected 0 5 0 .2

1755, July 6, a. m.

4 38 53 Immersion of Aldebaran, 3 telescopes.
— 6 51

⊙ tr. July 4		0 10 23½	12 40½
5		5 34	7 50½
6		5 43½	8 0½
9		6 12	8 28½
16		6 54½	9 11
July 16	Arcturus	6 30 8	
17	Arcturus	6 26 10.8	
18	Arcturus	6 22 13.5	
	☽	7 53 25.8	
19		0 7 6	9 21½

Corrections to "Mural" per corresp. alts.

1755, Jan. 23	$-6^{s}.2$
Apr. 15	$-0^{s}.7$
Apr. 21	$+0^{s}.3$
May 5	$+0^{s}.6$
May 26	$+1^{s}.5$

July 18.	Corresp. alts.
9 2 43	3 8 31.5
14 18.5	1 57.5

1755, July 18 9^{h} 15′ 17″ Imm. θ Libræ per 3 observers.

1757, Feb. 25, p. m.

6 53 57 Immersion of Aldebaran.
8 11 29 Commencement de l'émersion, il fait une échancrure au bord éclairé de la lune, et a esté plusieurs secondes sans se séparer de la bord de la lune, ce qui nous a fort étonné Mr. de Thury et moy.
11 39 Il est totalement séparé.

Feb. 24	⊙ tr.	0^{h} 18′ 26″.5	20′ 38″.5
25		18 12	20 32
26		17 57	20 8.7

1756, Dec. 13.

9 10′ 29″	8° 0′	3° 8′ 18″
13 35	8 20	3 5 4½
16 46½	8 40	3 1 54
20 3	9 0	58 41½
23 20	9 20	2 55 18½
26 41	9 40	2 52 0
30 4½	10 0	2 48 41

1756, Dec. 13, a. m.

4 33 44	imm. ε ♌	— 9 16	4 24 28
5 54 35	emersion	— 9 17	5 45 18

Duree
1 20 50 } Copy complete and literal.

1756, Dec. 17.

Dec. 12	⊙ tr.	0 7 58	10 21.5				
13	a. m. Regulus	— —	— —	4 40 52.5	9 7 15½	7° 20′	
13	⊙	8 20	10 42.5		10 20	7 40	
15	⊙	9 6	—		13 30½	8 0	
16	⊙	9 30.5	11 53		16 40½	8 20	
17	⊙	9 54.5	12 16	Décl. 8″ soust.	19 53½	8 40	2′ 1″

1758, Feb. 17.

10 36 25 Immersion of γ Geminorum.

Jan. 24, 1758.

Feb. 15	⊙ tr.	0 3 14½	5 28		9 47 52	14 10	2 56 20	bonne.
16		3 52½	6 6		51 14	14 30	2 52 57	med.
17	|☾	8 9 6½	10 51 (le ventre)		54 41	14 50	2 49 33	assez bonne.
	γ Gem.			8 14 59½			0 22 7½	
18	|(	8 59 2½					— 13	
19		0 5 42½	7 55½					
Jan. 23		0 20 47	23 6½				0 21 54½	
24		20 52½	23 11½				22 2	

Decl. mural (?) 7½

SERIES V.

Observations by DELISLE *at St. Petersburg.*

These observations have never been published. The original manuscripts were retained by DELISLE when he returned to Paris about 1749, and were eventually deposited at the Paris Observatory. In 1844, they were claimed by the Russian Government, delivered to OTTO STRUVE, and deposited at the Pulkowa Observatory. A full report upon them was made by STRUVE, who called attention to the possible value of the observations of occultations of the Pleiades which they contained. These occultations were discussed by LINSSER in 1864, who compared the observed times with those computed from HANSEN's Lunar Tables, showing a good agreement.

Desirous of including in the present investigation all that was valuable in DELISLE's observations, I took occasion, during a visit to Pulkowa, in March, 1871, to ask STRUVE's permission to examine the manuscripts, and make extracts for the purpose in view. This was very kindly granted, and the services of the secretary of the establishment, Mr. LINDEMANN, were placed at my disposal while engaged in the examination of this and the other treasures of astronomy which are contained in the library of the Observatory. I retain a very pleasant recollection of Mr. LINDEMANN's courtesy in rendering this assistance.

The extracts from DELISLE's manuscripts are given quite fully in the following pages. The reduction of the observations has given some trouble, owing to the multiplicity of clocks, and the varying and irregular manner in which the time and other observations were made. The general system of observation was the same as that pursued in Paris, the transits of the sun over the meridian of a gnomon being observed quite regularly, and the error of the gnomon being determined from time to time by corresponding altitudes of the sun before and after noon.

Place of observation, Observatoire Impérial en Basile Ostrow.

1727, le 21 février, nouv.

Hauteurs du soleil pour l'horloge.

Matin.	Hauteurs.	Soir.
$3^h\ 28^m\ 20^s$	13° 16′	$2^h\ 38^m\ 30\frac{1}{2}^s$
34 51	13 46	32 $1\frac{1}{2}$
37 $8\frac{1}{2}$	13 56	29 43
39 $21\frac{1}{2}$	14 6	27 $28\frac{1}{2}$
41 44	14 16	25 9
44 2	14 26	22 $52\frac{1}{2}$

Milieu	$0^h\ 3^m\ 26^s$
Correct. de Nadius soust. .	28
Midi vrai	0 2 58

Le 26, hauteurs du soleil pour l'horloge.

$9^h\ 14^m\ 17^s$	13° 56′	$9^h\ 28^m\ 23^s$	15° 6′
16 13	14 6	30 30	15 16
18 17	14 16	32 44	15 26
20 17	14 26	35 1	15 36
22 19	14 36	37 9	15 46
24 19	14 46	39 13	15 56
26 $21\frac{1}{2}$	14 56		

Le 27 février.

Le soir à $8^h\ 42^m\ 12^s$ de la pendule immersion dans la partie obscure de la lune d'une forte petite étoile de la queue du Bélier. Il y avait 2 autres étoiles plus considérables situées ainsi . . .

Le temps vrai de cette immersion déduit des midis le 21 et 28 février est à $8^h\ 40^m\ 53^s$.

Le 28 février.

Hauteurs du soleil pour l'horloge.

Matin.	Hauteurs.	Le soir.	Milieu.
$9^h\ 9^m\ 29^s$	14° 16′	$2^h\ 53^m\ 46^s$	$0^h\ 1^m\ 37\frac{1}{2}^s$
11 26	14 26	51 48½	0 1 37¼
13 23	14 36	49 51½	0 1 37¼
15 19	14 46	47 56	0 1 37½
17 16	14 56	46 0	0 1 38
19 11	15 6	44 5	0 1 36
21 12	15 16	42 0	0 1 36
23 20	15 26	39 53½	0 1 36¾
25 27	15 36	37 47	0 1 37
27 31½	15 46	35 43	0 1 37¼
29 27	15 56	33 46½	0 1 37

Milieu sans correction . .	$0^h\ 1^m\ 37^s$
Correction de Nadius soust.	— 28
Midi vrai	0 1 9
Midi vrai le 21	0 2 58
Difféeuce pour 7 jours .	1 49

Hauteur mérid. du bord sup. du soleil 22° 17′ 15″ fort exacte.

Instead of depending on the clock-rate from the altitudes of February 21 and February 28, I have utilized those made on the morning of the 26th. By computing the altitude from the corresponding observations of February 21 and 28, it appears that the altitudes as given require a correction of $-16'.2$ for semi-diameter and index-error. Applying this, we have an error of clock on apparent time of $1^m\ 41^s.5$. We then find:—

	Clock Fast, App. Time.	Equation of Time.	Clock-correction.
d h	*m s*	*m s*	*m s*
Feb. 25, 21.4	1 41.5	+ 13 25.3	+ 11 43.8
28, 0.0	1 8.0	+ 13 0.4	+ 11 52.4

Interpolating to the time of the occultation, we find:—

Clock-time of occultation of α Tauri, 1727, February 27 . .	$8^h\ 42^m\ 12^s$.
Clock-correction	$11^m\ 49^s.8$
Local mean time	$8^h\ 54^m\ 1^s.8$
Greenwich mean time	$6^h\ 52^m\ 48^s.3 \pm 2^s$.

Occultations of the Pleiades, 1729, *December* 3.—These observations being given, *in extenso*, by LINSSER, in the paper already referred to, I made no copy of them, but only compared the original here and there with LINSSER's printed data. It seems sufficient to present those of the results most likely to give rise to questions. LINSSER gives the following results for correction of the time of sun's transit over the gnomon:—

1729, Nov. 23	$+1^s 5$
1730, Feb. 1	$+3^s.8$
1730, Mar. 4	$+8^s.2$.

But he makes no statement of the correction which he actually adopts, nor of his grounds for adopting it, only remarking that it is interpolated from the above values By calculating backward from his results for clock-error, and his tabular data, he would seem to have adopted $+1^s.0$. It would, therefore, seem that he considered the correction to vary with the declination of the sun rather than with the time. But when the results for several years are placed together, they appear to vary only with the time. I therefore adopted $+2^s.5$ for the correction. The addition of a slight difference in the equation of time, arising from the periodic perturbations of the sun's longitude, being neglected in my work, carries the difference of computed mean times up to 2^s, an amount by which my mean times are less than those of **Linsser**. The following are my independent results, alongside of which I place for comparison those of **Linsser**. The results are a mean of those from the two clocks C and D, which differ between themselves by an amount varying from $1^s.4$ to $1^s.0$.

Date, 1729, *December* 3.

Star.	Local Mean Time of Occultation.	Linsser.	Sidereal Time.	Greenwich Mean Time.
	h m s	*s*	*h m s*	*h m s*
Electra .	16 35 57.9	59.7	9 27 24.9	14 34 44.4
Celæna .	41 39.6	41.5	33 7.6	40 26.1
Maja . .	17 16 56.6	58.8	10 8 30.3	15 15 43.1
Merope .	31 47.4	49.7	23 23.6	30 33.9
Alcyone .	48 13.8	15.6	39 52.7	47 0.3
Pleione .	18 32 17.4	19.7	11 24 3.5	16 31 3.9
Atlas . .	37 35.6	37.7	11 29 22.6	36 22.1

1733, le 22 Mars.

À midi vrai	C	$11^h\ 55'\ 17''$
	D	11 2 19
	N	11 57 59
	M	11 54 17

Le soir, occultation ν qui est dans un des pieds des Jumeaux. Immersion très exacte à $7^h\ 24^m\ 8\frac{1}{2}^s$. Pendule N avec plusieurs lunettes. Emersion à $8^h\ 30^m\ 20^s$ ± très incertaine.

Comparaison des pendules.

Immédiatement après l'immersion.			Immédiatement après l'émersion.		
$7^h\ 24^m\ 51\frac{1}{2}^s$	$6^h\ 31^m\ 0^s$	$7^h\ 27^m\ 41\frac{1}{2}^s$	$8^h\ 31^m\ 57^s$	$7^h\ 38^m\ 0^s$	$8^h\ 34^m\ 49^s$
7 25 $51\frac{1}{2}$	6 32 0	7 28 $41\frac{1}{2}$			
C	D	N	C	D	N

L'immersion est donc arrivée.

	Aux pendules.	Au temps vrais.	
C	$7^h\ 21^m\ 18\frac{1}{2}^s$	$7^h\ 26^m\ 10\frac{1}{2}^s$	La pendule N à ensuite été arrêtée.
D	6 27 27	7 26 10	
N	7 24 $8\frac{1}{2}$	7 26 12	

Le 23 Mars.

À midi vrai	C	$11^h\ 54^m\ 47^s$
	D	10 58 59
	N	0 0 3
	M	11 52 38

Le 24 Mars.

À midi vrai	C	11 54 $27\frac{1}{2}$
	D	10 55 48
	N	11 54 $31\frac{1}{2}$
	M	11 53 7

Le 25 Mars.

À midi vrai	C	11	54	5
	D	10	52	32
	N	11	54	41
	M	11	50	29

Le soir, occultation de ϰ ♋ dans un instant à $7^h\ 15^m\ 44^s\frac{1}{2}$ de la pendule C.

	C	N	D	C
Après l'immersion	$7^h\ 18^m\ 0^s$	$7^h\ 18\ 44\frac{1}{2}^s$	$6^h\ 19^m\ 0^s$	$7^h\ 21^m\ 26^s$

L'immersion est arrivée.

	Aux pendules.	Au temps vrais.
C	$7^h\ 15^m\ 44\frac{1}{2}^s$	$7^h\ 21^m\ 47\frac{1}{2}^s$
D	6 13 $18\frac{1}{2}$	7 21 47
N	7 16 29	7 21 48

La pendule M à été retardée 27^s en la remontant et avancée 10 min. pour l'approcher du temps vrai.

Le 27 Mars à midy	C	11′	53″	12^s
	D	10	46	1
	N	11	54	42
	M	0	0	$42\frac{1}{2}$

Dans ces calculs du temps vrai il n'y avait point d'erreur à la méridienne.
(To determine the error of meridian.)

Le 20 Mars. Hauteurs du bord supérieur du soleil.

Pend. E, 8^h	23^m	17^s	18°	21′	3^h	15^m	67″	$11^h\ 49^m$	$37\frac{1}{4}^s$
	24	58	18	31		14	20		39
	26	36	18	41		12	42		$39\frac{1}{4}$
	28	14	18	51		11	1		$37\frac{3}{4}$
	29	55	19	1		9	21		38
	31	$32\frac{1}{2}$	19	11		7	43		$37\frac{3}{4}$
	33	11	19	21		6	4		$37\frac{3}{4}$
	34	$53\frac{1}{2}$	19	31		4	22		$37\frac{3}{4}$
	36	31	19	41		2	44		$37\frac{3}{4}$
	38	12	19	51	3	1	6		39
	39	51	20	1	2	59	25		38
	41	38	20	11		57	40		38

Milieu	11^h	49′	38″	11‴
Correction			29	39
Pend. E	11	49	8	32
Diff. pend. . . .	0	40	30	30
Pendule D . . .	11	8	38	2
À la mérid. D . .	11	8	39	22
Correction de la méridienne . . .	—		12″	0‴

Le 28 Mars.

Uncorrected time of apparent noon from double altitudes with clock C	11^h	53^m	$14^s.7$
Correction of Euler		—	29. 6
True noon per clock C	11	52	45. 1
Difference of clocks at noon (D — C)	1	9	57. 0
True noon by clock D	10	42	48. 1
Transit of sun per clock D	10	42	48. 7
Correction		—	0. 6

The results for correction of gnomon are:—

1733, March 20 . . . . $-1^s.3$
March 28 . . . . $-0^s.6$.

The value $-1^s.0$ has been adopted. The corrections of the three clocks, C, D, and N, are then found to be as follows:—

		C	D	N
March 22.	At apparent noon,	$+11^m\ 47^s.3$	$+64^m\ 45^s.3$	$+9^m\ 5^s.3$
23.		$11^m\ 58^s.5$	$67^m\ 46^s.5$	$6^m\ 42^s.5$
25.		$12^m\ 3^s.0$	$73^m\ 36^s.0$	$11^m\ 27^s.0$
27.		$12^m\ 18^s.4$	$79^m\ 29^s.4$	$10^m\ 48^s.4$
28.		. . .	$82^m\ 22^s.5$	. .

We then have the following results for mean time from the three clocks:—

1733, March 22.

	C	D	N
Immersions of ν Gemin clock	$7^{h}\ 21^{m}\ 18^{s}.5$	$6^{h}\ 27^{m}\ 27^{s}.0$	$7^{h}\ 24^{m}\ 8^{s}.5$
Clock-corrections	$+\ 11^{m}\ 50^{s}.7$	$1^{h}\ 5^{m}\ 41^{s}.4$	?
Mean times	$7^{h}\ 33^{m}\ 9^{s}.2$	$7^{h}\ 33^{m}\ 8^{s}.4$.	. . .

1733, March 25.

Immersion of $\varkappa$ Cancri, clock	$7^{h}\ 15^{m}\ 44^{s}.5$	$6^{h}\ 13^{m}\ 18^{s}.5$	$7^{h}\ 16^{m}\ 29^{s}.0$
	$+\ 12^{m}\ 5^{s}.3$	$1^{h}\ 14^{m}\ 30^{s}.2$	$11^{m}\ 21^{s}.2$
	$7^{h}\ 27^{m}\ 49^{s}.8$	$7^{h}\ 27^{m}\ 48^{s}.7$	$7^{h}\ 27^{m}\ 50^{s}.2$.

The mean of the times given by the several clocks will be adopted.

1736, April 14. Transit of sun's centre, clock A, $1^{h}\ 32^{m}\ 11\tfrac{3}{4}^{s}$.

Comparison of clocks	M	1^{h}	38^{m}	0^{s}
	A	1	35	17
	N	1	52	43

Immersion of Aldebaran instantaneous at M, $11^{h}\ 56^{m}\ 30^{s}$.

Afterward	M	11^{h}	58^{m}	0^{s}
	A	11	55	5
	N	0	13	$24\tfrac{1}{2}$

"L'erreur de la méridienne est d'environ 7″ additive."

Times of the immersion.

	Pendules.			Temps vrai.		
A	11^{h}	53^{m}	35^{s}	10^{h}	19^{m}	$52\tfrac{3}{4}^{s}$
M	11	56	50	10	19	$55\tfrac{1}{4}$
N	0	11	$54\tfrac{1}{2}$	10	19	$58\tfrac{3}{4}$

April 15.	Sun on meridian	A	1^{h}	35^{m}	$25\tfrac{3}{4}^{s}$
		M	1	38	$37\tfrac{1}{2}$
		N	1	54	$54\tfrac{1}{2}$

Applying $+6^{s}.5$ for error of gnomon, we have the following results for clock-correction:—

	A	M	N
April 14. Apparent noon	$-92^{m}\ 10^{s}.7$	$-94^{m}\ 53^{s}.7$	$-109^{m}\ 36^{s}.7$
15. Apparent noon	$-95^{m}\ 40^{s}.0$	$-98^{m}\ 51^{s}.7$	$-115^{m}\ 8^{s}.7$.

The mean time of the observed occultation is then found from each of the clocks as follows:—

1736, April 14.

	A	M	N
Clock-times of imm. of α Tauri	$11^{h}\ 53^{m}\ 35^{s}$.	$11^{h}\ 56^{m}\ 30^{s}$.	$12^{h}\ 11^{m}\ 54^{s}.5$
Clock-corrections	$-1^{h}\ 33^{m}\ 40^{s}.7$	$-1^{h}\ 36^{m}\ 36^{s}.1$	$-1^{h}\ 51^{m}\ 59^{s}.7$
Local mean times . . .	$10\ 19^{m}\ 54^{s}.3$	$10^{h}\ 19^{m}\ 53^{s}.9$	$10^{h}\ 19^{m}\ 54^{s}.8$.

1736, June 20.

The correction of the meridian is found to be very accurately + 9.2^s, to be added to the observed times of transit of the sun.

Aug. 1.	Transit of the sun	A	$8^h\ 45^m\ 34^s$	
		M	$8\ \ 41\ \ 58$	
	Pendule nouvelle, afterward stopped		[$8\ \ 48\ \ 40$]	nouvelle.
			$8\ \ 48\ \ 22$	supérieure.
	Next morning immersion of Aldebaran very exact . . .	A	$2^h\ 59^m\ 9\frac{1}{2}^s$	
	emersion	A	$4\ \ 10\ \ 59$	

"Je crois qu'elle ne faisait que de sortir quand je l'ai aperçu car j'étais fort attentif et elle m'a paru d'abord fort brillant à l'endroit de la lune où je l'attendais."

Après l'immersion	M	$2^h\ 58^m\ 0^s$	Après l'émersion	M	$4^h\ 9^m\ 0^s$
	A	$3\ \ 1\ \ 40\frac{1}{2}$		A	$4\ \ 12\ \ 39$
	Sup.	$3\ \ 4\ \ 26$		Sup.	$4\ \ 15\ \ 26$

	Immersion.		Emersion.	
	Clock.	True.	Clock.	True.
A	$2^h\ 59^m\ 9\frac{1}{2}^s$	[$6^h\ 10^m\ 34^s$]	$4^h\ 10^m\ 59^s$	[$7^h\ 22^m\ 56^s$]
M	$2\ \ 55\ \ 29$	$6\ \ 10\ \ 25\frac{1}{2}$	$4\ \ 7\ \ 20$	$7\ \ 22\ \ 47$
Sup.	$3\ \ 1\ \ 55$	$6\ \ 10\ \ 27\frac{1}{2}$	$4\ \ 13\ \ 46$	$7\ \ 22\ \ 48\frac{1}{2}$

Aug. 2.	Sun on meridian . . . . clock	A	$8^h\ 49^m\ 22^s$
		M	$8\ \ 45\ \ 50$
		Sup.	$8\ \ 52\ \ 15$

I find no reason given for rejecting clock A, except its discordance.

Proceeding as usual, and adding + $9^s.2$ for error of gnomon, we have the following results for correction of the three clocks, A, M, and Sup:—

	A.	M.	Sup.
Clock-times of transit, August 1 .	$8^h\ 45^m\ 43^s.2$	$8^h\ 42^m\ 7^s.2$	$8^h\ 48^m\ 31^s.2$
Mean time	$0^h\ 5^m\ 46^s.9$	. . . .	. . . .
Clock-corrections	$15^h\ 20^m\ 3^s.7$	$15^h\ 23^m\ 39^s.7$	$15^h\ 17^m\ 15^s.7$
Clock-times of transit, August 2 .	$8^h\ 49^m\ 31^s.2$	$8^h\ 45^m\ 59^s.2$	$8^h\ 52^m\ 24^s.2$
Mean time	$0^h\ 5^m\ 42^s.9$	. . . .	. . . .
Clock-corrections	$15^h\ 16^m\ 11^s.7$	$15^h\ 19^m\ 43^s.7$	$15^h\ 13^m\ 18^s.7$
Immersions of α Tauri, clock . .	$2^h\ 59^m\ 9^s\ 5$	$2^h\ 55^m\ 29^s.0$	$3^h\ 1^m\ 55^s.0$
Clock-corrections	$15^h\ 17^m\ 8^s.0$	$15^h\ 20^m\ 40^s.9$	$15^h\ 14^m\ 16^s.2$
Mean times	$18^h\ 16^m\ 17^s.5$	$18^h\ 16^m\ 9^s.9$	$18^h\ 16^m\ 11^s.2$
Emersions, clock	$4^h\ 10^m\ 59^s.$	$4^h\ 7^m\ 20^s.$	$4^h\ 13^m\ 46^s.$
Clock-corrections	$15^h\ 16^m\ 56^s.4$	$15^h\ 20^m\ 29^s.2$	$15^h\ 14^m\ 4^s.4$
Mean times	$19^h\ 27^m\ 55^s.4$	$19^h\ 27^m\ 49^s.2$	$19^h\ 27^m\ 50^s.4$

In doubt whether to reject or retain clock A, I shall give it half-weight in taking the mean.

Occultation of Aldebaran Oct. 23, a. m., 1736.

Immersion very exact at bright limb	A	$4^h\ 50^m\ 58^s$
Emersion	A	$6\ \ 6\ \ 1$

". . . Quoiqu'il y eut un grand brouillard au traverse dequel la lune paraissait et qui empêchait de bien distinguer les taches; cependant ayant encore dirigé la lunette catadioptrique à l'endroit on se devait faire cette émersion j'ai commencé à voir Aldebaran sorti de dessous la lune à $6^h\ 6^m\ 1^s$ de la pendule A et je crois que ce temps est le premier moment de son émersion n'ayant rien vû peu de seconds auparavant au même endroit.

"Cette occultation, suivant mon observation est donc arrivée:—

	L'immersion.		L'émersion.	
	Pendules.	Temps vrai.	Pendules.	Temps vrai.
A	$4^h\ 50^m\ 58^s$	$3^h\ 0^m\ 32^s$	$6^h\ 6^m\ 1^s$	$4^h\ 15^m\ 23^s$
M	$4\ 47\ 6\frac{1}{2}$	$3\ 0\ 36$	$6\ 2\ 6\frac{1}{4}$	$4\ 15\ 26$"

The data for clock-error are somewhat irregular.

We have:—

16 octobre Sun on meridian (gnomon) A $1^h\ 19^m\ 20^s$ M $1^h\ 18^m\ 55^s$
Transit of sun over 5th wire of mural sext. $1\ 19\ 27\frac{3}{4}$
Passage of diameter $2^m\ 10\frac{1}{2}^s$
Pendule A ensuite arrétée, et la pendule M avancée 7 min.

Afterward, the following transits over 5th wire of the mural quadrant:—

Oct 18.	Sun's II limb	A	1^h	34^m	$41\frac{2}{3}^s$	$M = A - 1^m\ 15\frac{1}{2}^s$
20.	γ Aquilae		7	32	44	
	α Aquilae		7	36	59	
	β Aquilae		7	41	$28\frac{1}{2}$	
22.	Mars		1	1	$51\frac{1}{4}$	
	μ ♓		1	15	$20\frac{1}{4}$	
	Bor. Caud. Ceti . . .		1	37	51	
	Lucida ♈		1	50	50	
	1^a Hyad.		4	3	$30\frac{1}{4}$	
	☾ bord suivant . . .		4	18	$34\frac{1}{2}$	
	Aldebaran		4	19	$28\frac{1}{2}$	
	Rigel		5	1	$11\frac{1}{2}$	$-3^m\ 52^s$ at $4^h\ 54^m$ A
	Bellatrix		5	9	54	
	Balt. Orion.		5	17	38	
				21	58	
				26	$36\frac{1}{2}$	
		At	6	13		$M - A = -3^m\ 55\frac{2}{3}^s$
23.	Sun II limb		1	53	5	$-4\ 9$

(Here Delisle "supposes error of meridian" $+10\frac{1}{2}$ seconds.)

β Aquilæ	7	41	$11\frac{3}{4}$
Jupiter	8	42	52
Nodi ♓	0	53	25
Mars	1	0	$26\frac{1}{2}$

La pendule M à éte arrétée. Pendule A, Oct. 30, ret. 14^s en la remontant.

Nov. 4.	Sun's centre (mean of limbs) . .	A	2 38 $44\frac{1}{4}$
	Gnomon		2 38 30
	Diff.		$+11\frac{1}{4}$ (sic)

The correction to the time of transit over the mural sextant for the declination of the sun at this time seems to be about $+ 3^s$. We have then the following results for correction of clock A:—

1736, October 18	Transit of ☉	$-1^h\ 48^m\ 25^s.5$
22.	Transit of Rigel	$-2^h\ 6^m\ 7^s.2$
23.	Transit of ☉	$-2^h\ 7^m\ 34^s.5$.

Interpolating to the time of occultation of Aldebaran, we have:—

Clock-times	$16^h\ 50^m\ 58^s$	$18^h\ 6^m\ 1^s$.
Cock-corrections	$-\ 2^h\ 6^m\ 5^s.6$	$-\ 2^h\ 6^m\ 17^s.6$
Mean times	$14^h\ 44^m\ 52^s.4$	$15^h\ 59^m\ 43^s.4$.

These results are 10^s less than those of Delisle, and more uncertain than usual.

For error of meridian (gnomon), April 22, 1737.

Transit of sun over 5th wire, mural sextant . .	A	$1^h\ 57^m\ 46\frac{5}{8}^s$	C = A +	$8^m\ 30\frac{1}{4}^s$
Meridian (gnomon)		$58\ \ 14\frac{1}{4}$		$2^h\ 6\ \ 44\frac{1}{2}$ = C
Correction of sextant		$27\frac{5}{8}$		

From 13 pairs equal altitudes with clock H, at a mean interval of $5^h\ 42^m$.

Sun at greatest height	$14^h\ 7^m\ 37.2^s$	H
Euler's correction	$-\ 22.1$	
True transit of sun	$14\ \ 7\ \ 15.1$	
C — H	$-\ 21.7$	
True transit per C	$14\ \ 6\ \ 53.4$	
Observed with gnomon	$14\ \ 6\ \ 44.4$	
Correction of gnomon	$+\ 9.0$	
Correction of sextant	36.6	

1737, May 1.

Transit of sun, mural sextant	A	$2^h\ 33^m\ 4\frac{3}{4}^s$	C = A +	$1^m\ 1\frac{1}{4}^s$
Meridian, gnomon		$2\ \ 33\ \ 35\frac{1}{2}$		$2^h\ 34\ \ 36\frac{3}{4}$ = C
G. — S.		$+\ 30\frac{1}{2}$		

From 12 equal altitudes of the sun, interval $6^h\ 56^m$.

Mean for meridian	$14^h\ 38^m\ 23.8^s$	H
Diff. of clocks C and H	$12\ \ 3\ \ 19.3$	
Apparent noon per C	$2\ \ 35\ \ 4.5$	
Euler's correction	$-\ 20.7$	
Corrected apparent noon	$2\ \ 34\ \ 43.8$	
Error of gnomon	$+\ 7.0$	
Error of sextant	$+\ 37.5$	

1737, May 7, soir.

Immersion of ξ Leonis (pied boreal) instantaneous		N	$0^h\ 57^m\ 27^s$
For clock-correction:			
Sun on meridian (gnomon) May 7		C	$2^h\ 58^m\ 2^s.3$
Mural sextant	A $2^h\ 53^m\ 48.1^s$		
Correct. (G. — S.)	$+32.2^s$		

Times of gnomonic noon by the various clocks.

A	$2^h\ 54^m\ 21.3^s$	After which C was retarded 14^s by winding.
C	$2\ \ 58\ \ 2.3$	
M	$2\ \ 51\ \ 5.3$	
H	$14\ \ 43\ \ 51.3$	
N	$3\ \ 10\ \ 24.3$	

The immersion was at—

	Clocks.	True times.
A	$0^h\ 41^m\ 5^s$	$9^h\ 45^m\ 15\frac{3}{4}^s$
C	$0\ \ 44\ \ 45$	$9\ \ 45\ \ 14$
M	$0\ \ 37\ \ 47$	$9\ \ 45\ \ 17\frac{3}{4}$
H	$0\ \ 30\ \ 25$	$9\ \ 45\ \ 15\frac{1}{4}$
N	$0\ \ 57\ \ 27$	$9\ \ 45\ \ 18\frac{3}{4}$

Transmits with mural sextant.

May 7.	Sirius	A	6^h	30^m	50^s
	Procyon		7	22	17
	☽ I		9	5	34
	Cor. ♌		9	50	$52\frac{1}{2}$
	Cauda ♌		11	32	5
	Spica		1	8	$28\frac{1}{2}$
	Arcturus		1	59	58

Pendule H deranged 2 or 3 seconds by the cords.

		A	6^h	25^m	0^s	
		C	6	28	32	
		M	6	21	$43\frac{1}{2}$	
May 8.	Sun on gnomon	A	2	57	49.7	
		C	3	1	46.2	The sextant $33^s.5$ sooner.
		M	2	54	24.7	
		H	14	47	3.7	
		N	3	14	40.2	

Applying + $8^s.5$ for correction of gnomon, and taking from clock C on May 7 the 14^s by which it was retarded in winding, we have the following results for clock-correction:—

At transit of ⊙.

	May 7.	May 8.
Clock A	$-\ 2^h\ 58^m\ 17^s.9$	$-\ 3^h\ 1^m\ 50^s.4$
C	$-\ 3^h\ 1^m\ 44^s.9$	$-\ 3^h\ 5^m\ 46^s.9$
M	$-\ 2^h\ 55^m\ 1^s.9$	$-\ 2^h\ 58^m\ 25^s.4$
H	$-14^h\ 47^m\ 47^s.9$	$-14^h\ 51^m\ 4^s.4$
N	$-\ 3^h\ 14^m\ 20^s.9$	$-\ 3^h\ 18^m\ 40^s.9$.

The mean time of the occultation, as given by the several clocks, is then as follows:—

A	$9^h\ 41^m\ 21^s.4$
C	$19^s.1$
M	$22^s.4$
H	$17^s.3$:
N	$20^s.4$
Mean	$9^h\ 41^m\ 20^s.8$

1737, May 20.

Ten corresponding pairs of sun's altitudes give for the correction of the gnomon + $11^s.5$.

May 23, a. m. Occultation of Jupiter in daylight.

19^h 58^m $25\frac{1}{2}^s$ H Jupiter me paraissait toucher le bord éclairé de la lune.

				True times.	
20	0	$15\frac{1}{2}$	H	$16^h\ 1^m\ 9\frac{1}{4}^s$	Jupiter me paraisse tout entré.
8	2	$19\frac{1}{4}$	A	16 1 $9\frac{1}{2}$	
8	3	$22\frac{1}{4}$	C	16 1 9	
7	59	$38\frac{1}{4}$	N	[16 0 $58\frac{1}{4}$]	
8	3	$52\frac{1}{2}$	M	16 1 $8\frac{3}{4}$	

Clocks.

May 22.	Sun on gnomon	A	3^h	58^m	20.5^s	
		C	3	59	15.0	(obs.)
		H	3	56	37.5	
		M	3	55	43.8	
	Mural sextant	A	3	57	41.0	
	G. — S.				39.5	
May 23.	Mural sextant	A	4^h	1^m	36.5^s	
		C	4	2	42.8	C
		M	4	3	41.0	
		H	3	59	22.5	
		N	3	58	52.5	

Le fil de la méridienne étant rompu l'on n'a pu observer le passage de l'image du soleil à cette méridienne.

Transits with Mural sextant.

May 22.	Venus .	6^h	2^m	22^s	A	A	1^h	54^m	0^s
	Spica	1	13	32		C	1	55	$0\frac{1}{4}$
	Arcturus	2	5	1		M	1	55	9

DELISLE's reduction is correct for clock H. Taking the mean of his results, the apparent and mean times of contact of limbs of Jupiter and the moon will be:—

First contact, apparent time $15^h\ 59^m\ 19^s.1$ (eq. $= -3^m\ 47^s.3$) m. t. $= 15^h\ 55^m\ 31^s.8$

Second contact, apparent time $16^h\ 1^m\ 9^s.1$ . . . . $15^h\ 57^m\ 21^s.8$

Whence local mean time for centre of Jupiter . . . . $15^h\ 56^m\ 26^s.8$

1737, July 23, a. m. Occultation of θ Tauri.

					Obs. HEINSIUS.				DELISLE finds :		
Immersion of star *a* (meriodionale) (prec.)	A	9^h	5^m	$38\frac{1}{2}^s$	H (1)	21^h	5^m	24^s	12^h	59^m	$36^s.0$
Emersion of *b* northernmost, and	A	9	38	8	H	21	37	53	13	30	0.2
a	A	9	50	46	H	21	50	31	13	42	36.6

For clocks.

July 21.	Sun culm. mean of 10 pair corresp. altitudes	8^h	2^m	28.7^s	H	Interval $8^h\ 0^m$.
	Euler's correction			+ 13.8		
	True app. noon	8	2	42.5		
	Clocks B — H		9	22.0		
	True noon B	7	53	20.5		
	Sun on gnomon, meridian	7	53	12.0	B	
	Correction of gnomon			+ 8.5		
	Transit over 5th wire of mural sextant					$8^h\ 1^m\ 33\frac{1}{2}^s$ A
	Correction (G. — S.)					+ 42.5
July 23.	Sun on gnomon	7^h	43^m	$50\frac{1}{2}^s$	A or B (?) he says A	
	Sextant	8	9	4	A =	$7^h\ 43^m\ 9^s$ B
July 25.	10 pair equal altitudes, interval $7^h\ 59^m$ give	8^h	15^m	$44^s.7$	H	
	Euler's correction			15.5		
	App. noon	8	16	0.2		
	Diff. clocks, B — H	0	41	18.8		
	App. noon clock B	7	34	41.4	B	
	Meridian (gnomon) B	7	34	34.2		
	Correction of gnomon			+ 7.2		

Clock-comparisons.

July 21, noon.				22 soir.				22 soir.				23 a. m.				23 noon.			
h	*m*	*s*		*h*	*m*	*s*		*h*	*m*	*s*		*h*	*m*	*s*		*h*	*m*	*s*	
8	5	0	A	2	7	0	A	7	50	0	A	9	53	0	A	8	13	0	A
7	55	56	B	1	47	25½	B	19	49	47¾	H	21	52	46	H	7	47	5	B
8	6	53½	C	2	10	46	C	7	50	11	N	9	53	10½	N	8	17	38	C
[0	3	45¼	D]	6	0	56	D	7	52	0	A	9	56	0	A	0	4	48¾	D
11	49	31	E	5	30	54½	E	7	30	22½	B	9	39	39	B	11	24	30	E
8	3	30	G	2	3	57¼	G	7	56	7½	C	[10	0	15½	C]*				
8	5	18	H	.	.	.						9	56	54	M	8	14	0	A
8	4	53	M	2	7	41⅓	M	7	54	0	A					8	10	2	G
8	5	25	N					11	47	15½	D	9	58	0	A	8	14	27⅛	J
								11	13	57	E	1	51	1	D	8	20	59¾	K
								7	54	51	M	1	16	31½	E	8	15	4	M
								7	56	0	A	9	59	0	A	8	16	0	A
								7	52	40	G	9	59	13	J	8	15	55	H
								7	56	10	J	9	55	33¼	G	8	16	8	N
								11	56	31¼	K								

* Afterward retarded 13^s in winding.

The clock-corrections have to be interpolated from the noons of July 21 and July 23. The system of proceeding will be this:—Taking clock A as a standard, we shall find the errors of the other clocks for the comparisons nearest the occultations, on the supposition that A is correct. The mean deviation being supposed to arise from changes in the rate of A, the latter will be corrected, so that the result shall be that given by the mean of all the clocks. We have, first:—

Clock.	Other Clocks, *minus* A, etc.		July 22.5, 7^h 52^m A.			9^h 56^m A.		
	(1)	(2)						
	July 21.0, 8^h 5^m A	July 23.0, 8^h 14^m A	Comp.	Obs.	Δ	Comp.	Obs.	Δ
	m *s*	*m* *s*	*m* *s*	*s*	*s*	*m* *s*	*s*	*s*
B	− 9 4.0	− 25 55.3	− 21 35.3	− 37.5	− 2.2	− 22 18.7	− 21.0	− 2.3
C	+ 1 53.5	+ 4 38.0	+ 3 55.8	+ (67.5)	+ 2.2	+ 4 2.8	+ 15.5	+ 2.7
E	+ 224 31.0	+ 191 30.0	. .	. .	. .	. .	. .	. .
G	− 1 30.0	− 3 58.0	− 3 20.2	− 20.0	+ 0.2	− 3 26.3	− 26.8	− 0.5
H	+ 0 18.0	− 0 5.0	+ 0 0.9	− 12.2	− 13.1	− 0.1	− 14.0	− 13.9
M	− 0 7.0	+ 1 4.0	+ 0 45.7	+ 51.0	+ 6.3	+ 48.8	+ 54.0	+ 5.2
N	+ 0 25.0	+ 0 8.0	+ 0 12.4	+ 11.0	− 1.4	+ 11.6	+ 10.5	− 1.1

The 13 seconds by which C was thrown back is allowed for in columns Δ. The discordance of H seems to indicate that there is a mistake in its comparison for July 23.0. The general result is that the rate of A agrees very nearly with the mean of the other rates, while the discordance of H and M are such that it is impossible to say whether the correction to the position of A for July 22.5 should be positive or negative. We shall therefore suppose the rate of A correct; its corrections will be found as follows:—

	July 21.	July 23.
Clock times of ⊙'s transit (true mer.) .	$8^{h}\ 2^{m}\ 24^{s}.5$	$8^{h}\ 9^{m}\ 53^{s}.3$
Mean times	$0^{h}\ 5^{m}\ 49^{s}.3$	$0^{h}\ 5^{m}\ 55^{s}.4$
Clock-corrections	$+4^{h}\ 3^{m}\ 24^{s}.8$	$3^{h}\ 56^{m}\ 2^{s}.1$

At the time of the occultation, the difference of clocks A and H was $13^{s}.3$. It appears, therefore, that HEINSIUS observed the occultations about $1^{s}.5$ earlier than DELISLE. Taking the mean of the two observers, we have:—

	θ_1 Imm.	θ_1 Em.	θ_2 Em.
Clock-times by A	$9^{h}\ 5^{m}\ 37^{s}.9$	$9^{h}\ 38^{m}\ 7^{s}.2$	$9^{h}\ 50^{m}\ 45^{s}.2$
Clock-corrections	$3^{h}\ 57^{m}\ 44^{s}.0$	$3^{h}\ 57^{m}\ 38^{s}.9$	$3^{h}\ 57^{m}\ 37^{s}.1$
Mean times . .	$13^{h}\ 3^{m}\ 21^{s}.9$	$13^{h}\ 35^{m}\ 46^{s}.1$	$13^{h}\ 48^{m}\ 22^{s}.3$

1738. Jan. 2. Occultation of Aldebaran and the Hyades.

Immersion of *f*, instantaneous.			θ^1 Tauri.	θ^2 Tauri.
2 observers diff. $1\frac{1}{2}^{s}$.		Sec. of app. time.		
$1^{h}\ 7^{m}\ 19^{s}$	A	18	$2^{h}\ 17^{m}\ 4\frac{3}{4}^{s}$	52
1 11 45	B	$19\frac{1}{4}$	2 21 $30\frac{1}{2}$	52
6 26 2	D	18	7 35 $34\frac{1}{2}$	$51\frac{1}{2}$
1 9 $47\frac{1}{2}$	G	$18\frac{1}{2}$	2 19 $32\frac{1}{2}$	$51\frac{1}{2}$
1 7 7	H	20	2 17 $4\frac{1}{2}$	54
1 10 28.5	J	18	2 20 $13\frac{1}{2}$	52
1 3 16	K	$18\frac{1}{2}$	2 12 $59\frac{1}{2}$	51
			$+\ 1^{s}$	

The following are the apparent times from the mean of all the clocks, supposing DELISLE to have applied the right clock-correction:—

Immersion of *f*	6^{h}	15^{m}	$18.^{s}5$		
θ^1	7	24	52.0	-1^{s}	
θ^2	7	28	8.0	-1^{s}	
Aldebaran	12	18	46.0	-0.5^{s}	Emers. $12^{h}\ 58^{m}\ 25^{s}$. Observer thinks right; but the other observer is put down 10^{s} later.
m	8	46	16		

1737. Nov. 25.

Transit of sun, sextant	$4^{h}\ 7^{m}\ 43^{s}.1$	B
gnomon	4 7 34 .5	B
G. — S.	$-$ 8 .6	

1738. Jan. 3.

Transit of sun, sextant	$7^{h}\ 0^{m}\ 7^{s}.6$	B
gnomon	6 59 59 .9	B
G. — S.	$-$7 .7	

Febr. 25.	Correction of gnomon from 6 pair altitudes . .	$+\ 2^{s}.7$	
March 19.	" " " " . .	+ 6 .8	
Jan. 2, a. m.	Transits with sextant.		
	Spica	$1^{h}\ 14^{m}\ 37^{s}$	B
	Arcturus	2 6 $5\frac{1}{2}$	
p. m.	Algenib.	0 2 $31\frac{1}{2}$	
	Luc. ♈	1 55 3	
	1^{a} Hyadum	4 7 42	
	Aldebaran	4 23 41	
	Sirius	6 37 13	

We have to adopt DELISLE's apparent times. The error of the gnomon is quite uncertain, so that the times are also uncertain. Applying the equation of time, which ranges from $+4^m\ 45^s.5$ to $+4^m\ 52^s.0$, we have for the mean times of the phenomena:—

71 Tauri, immersion, 1738, January 2	$6^h\ 20^m\ 4^s.0$
θ_1	$7^h\ 29^m\ 38^s.5$
θ_2	$7^h\ 32^m\ 54^s.5$
$*$ m, B. A. C. 1391 (?)	$8^h\ 51^m\ 3^s.5$
α Tauri	$12^h\ 23^m\ 37^s.8$
Em	$13^h\ 3^m\ 17^s.8$

1738. Febr. 2, soir.

Immersion of f II at . . . . $17^h\ 5^m\ 37^s$ H
$4\ \ 59\ \ 18$ A $7^h\ 55^m\ 34^s$ app. t.
Apparent time, mean of four clocks . . . $7^h\ 55^m\ 33^s$ 1
But the gnomon is supposed correct.
Sun on gnomon Febr. 2 . . . . $9^h\ 2^m\ 27^s$ A
" 3 . . . . $9\ \ 6\ \ 30$ A

1738, Aug. 3. Correction of gnomon . . . . $+7^s.3$
" 19. " " . . . . $+5\ .6$

1738, Octb. 2, soir, occultation d'Aldebaran.
Immersion, exact at . . . . $0^h\ 10^m\ 1.5^s$ H. (2 observers.)
Emersion . . . . $1\ \ 10\ \ 27$ H. Observer HEINSIUS.

1739, Octb. 24, matin, occultation de l'étoile 1 de la sixième grandeur que Mr. FLAMSTEED appele la boréale des trois qui suivent le bras droit des Jumeaux.
Immersion dans la partie éclairé de la lune à . . . . $3^h\ 50^m\ 44^s$ B
Presqu'à la précision d'une seconde.
Moment précise de l'émersion . . . . $5^h\ 1^m\ 37^s$ B

1739, Octbr. 25, matin. Immersion δ Cancri (within 1 sec.) $3^h\ 24^m\ 58^s$ B
Emersion, instantaneous . . . . $4\ \ 31\ \ 32$ B

1741, March 24. À midi l'on a commencé à observer aujourdhui le passage du soleil à une nouvelle méridienne filaire tracée dans le grand observatoire supérieure, pendule K comme il suit . . . . $0^h\ 12^m\ 40\frac{1}{4}^s$ Mean of 2.
$0\ \ 14\ \ 59\frac{3}{4}$
$2\ \ 19.5$
The usual gnomon $1\frac{1}{2}$ sec. earlier . . . $0\ \ 13\ \ 50.0$

March 25, soir, immersion η Cancri $0^h\ 7^m\ 54^s$ K (2 observers agree exactly).

1741, March 1. Cor. to meridian (gnomon) per double altitudes . . . . $+\ 1\frac{3}{4}^s$
April 25 . . . . $+\ 6\frac{1}{4}$
Mérid. supérieure . . . . $+\ 1.3$
July 11. Inf. . . . . $+11.0$
Sup. . . . . $+\ 3.9$

Applying $+7^s.0$ for correction of gnomon, we find the correction of clock G on mean time to be:—

August 8.	At $8^h\ 55^m\ 21^s.7$ of G,	corr. $= +3^h\ 9^m\ 49^s.6$
9.	At $8^h\ 58^m\ 40^s.2$ of G,	corr. $= +3^h\ 6^m\ 23^s.4$

The clocks appear to agree so well that no reduction of the others is necessary.

There is, however, an obvious mistake of 4^s in the time of immersion of Aldebaran, as given by G. Interpolating clock-correction, we have the following local mean times:—

1738, August 8.	Immersion of 71 Tauri	$15^h\ 3^m\ 10^s.0$
	Emersion of 71 Tauri	$15^h\ 59^m\ 5^s.9$
	Immersion of θ_1 Tauri	$16^h\ 21^m\ 50^s.7$
	Immersion of θ_2 Tauri	$16^h\ 22^m\ 7^s.7$
	α Tauri	$21^h\ 18^m\ 5^s.4$
	Immersion of α Tauri	$22^h\ 7^m\ 49^s.3$.

§ 11.

POSITIONS OF THE MOON FROM HANSEN'S TABLES, USED IN COMPARING THE PRECEDING OBSERVATIONS WITH THEORY.

When a number of places of the moon are to be computed, several modifications may be made in the use of the tables, whereby the labor of computation will be diminished.

(1) *Omission of terms unimportant on account of their minuteness.*

The older observations are so far from exact that there is no advantage in carrying the computation of the Fundamental Argument to the last degree of precision. Portions of the double-entry tables may, therefore, be omitted in comparing such observations with theory. The minuter terms are those contained in the twenty-seven tables of double-entry: all or a part of these tables may be omitted with the following results:—

If the twenty-seven double-entry tables, XII to XXXVIII, are all omitted, and the sum of their constants, 0.0022240, substituted, the probable deviation of the computed longitude from that given by a rigorous computation will be $\pm 13''.6$

If the seventeen tables, XXII to XXXVIII, are omitted, and the sum of their constants, 4290, substituted, the probable deviation will be $\pm 2''.7$.

If the nine tables, XXX to XXXVIII, are omitted, and the constant, 1140, substituted, the probable deviation of the result will be $\pm 0''.85$.*

(2) *Modifications when many places of the moon are to be computed.*

These modifications refer principally to the formation of the arguments, and the introduction of the terms of long period. They are applicable when places of the moon are required for a series of dates in which there is no interval greatly exceeding a year. The following is a description of the method of forming the arguments actually adopted for the years after 1632.

The dates were divided into groups of not more than ten or twelve, except in cases where a number of dates were crowded together, when the number might be a little greater. A group always had to terminate when an interval of much more than one year was encountered. When no such interval occurred for several successive groups, the same date was taken as the last of one group and the first of the group following.

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* It is to be remarked that in cases where an approximate position of the moon is required for any purpose, this plan of using HANSEN'S Tables, with the omission of the smaller terms (always taking care to include the constant terms of the omitted tables), is much better than that of using the older tables, the elements of which are affected with unknown systematic errors.

All the arguments were then computed for the limiting dates of each group in the usual way. Those of single entry, including *g* for the intermediate dates, were then found by adding to those for each date the interval in days between that and the date next following, and subtracting the greatest number of entire periods contained in the sum. The double-entry arguments are constant for each period of *g*, and change by a definite amount for every new period. To pass from those for one date to those for the date next following, it was only necessary to add or subtract a number depending on the number of periods of *g* which had terminated during the interval. To enable this to be done with the least labor, and risk of error, a long slip of paper was prepared for each number of periods of *g*. On the bottom of each slip was written, in regular order, the quantity by which each argument increased during the number of periods corresponding to the slip. On the opposite side and edge of the slip were written, in red ink, the complements of these numbers; that is, the quantities by which they fell short of one period of the argument. Then, to pass from the values of the arguments from one date to those for the succeeding one, the number of entire periods of *g* which had been subtracted was noted, and the corresponding slip taken. Being laid over the row of arguments, the red numbers were first subtracted in all cases where they were less than the argument. Then, turning the slip over, the black numbers were added in all the remaining cases.

When the end of the group was reached, the series of arguments thus obtained was compared with those derived by direct computation; and if they agreed, which was nearly always the case, the intermediate arguments were all considered correct. The only way in which they could be erroneous would be by two opposite and equal errors entering into the same series. The computer who formed the arguments in this way was the Rev. PARKER PHILLIPS, whose conscientiousness and accuracy were such as to inspire entire confidence in his work.

(3) *Terms of long period produced by Venus.*

The variation of these terms is so slow and regular that it is much easier to include their sum in the original computations of the arguments than to compute and add them for each date. Their sum was, therefore, computed for the beginning of every tenth year, and interpolated to every year, as shown in the next table. Their product by the proper factors to form the corrections to Arguments 32 and 33 was also computed, and included in the same table. These arguments are farther to be corrected on account of the terms of long period corresponding to Arguments 28 and 29; but the error from omitting these terms is so small, scarcely $0''.1$ in the mean, that they have been neglected. In place of them, the constant quantities $+200$ and $+186$ have been included in the table.

The addition of these corrections to the three leading arguments necessitates a correction corresponding to their change during the interval between two consecutive dates, to be applied to that interval in order to find the total change of the argument. The amount of this change for 100 days in units of the last place in the argument is tabulated, and shown in the table next following that last described.

The explanation of the several parts of the table is as follows:—

Column Δg gives, for the beginning of each year, the sum of HANSEN'S Venus-terms of long period, as derived from Tables XLI and XLII, Arguments 30 and 31, without any modification.

The precepts of the tables direct that Arguments 32 and 33 be corrected by the sum of the four Tables XXXIX to XLII inclusive, multiplied by the factors 0.11545 and 0.10717 respectively. The sum of the first two tables differs so little from that of their constants, 1735, that we may use the latter; we have therefore put

$$\Delta 32 = 0.11545 \, (\Delta g + 1735) = 0.11545 \, \Delta g + 200$$

$$\Delta 33 = 0.10717 \, (\Delta g + 1735) = 0.10717 \, \Delta g + 186.$$

Arguments 32 and 33 are to be corrected by these quantities respectively.

The change of g between two consecutive dates varies, not only in consequence of the variation of Δg, but of the secular acceleration. The change of the variation in the seventh decimal place of g for 100 days, in order to reduce it to the adopted period corresponding to the epoch 1800, as arising from both these sources, is as follows:—

Date.	Secular Term.	Venus Terms.	Date.	Secular Term.	Venus Terms.
1620	−103.31	− 4.11	1710	− 51.72	+ 30.62
1630	− 97.58	+ 4.06	1720	− 45.98	+ 24.85
1640	− 91.85	+ 12.23	1730	− 40.24	+ 17.11
1650	− 86.12	+ 19.93	1740	− 34.49	+ 8.04
1660	− 80.39	+ 26.50	1750	− 28.74	− 1.74
1670	− 74.66	+ 31.61	1760	− 22.99	− 11.64
1680	− 68.93	+ 34.79	1770	− 17.25	− 21.10
1690	− 63.19	+ 35.70	1780	− 11.50	− 29.46
1700	− 57.46	+ 34.30	1790	− 5.75	− 36.09
1710	− 51.72	+ 30.62	1800	0.00	− 40.50

The sum of these terms, interpolated to the beginning of each year, is given in the table as $\frac{d \Delta g}{dt}$, while the corresponding terms for correcting Arguments 32 and 33 follow. To find the change of g and of Arguments 32 and 33 between the epochs t and $t + \Delta t$, it is necessary to take out the values of these three derivatives for the time $t + \frac{1}{2} \Delta t$, when we shall have:—

$$\text{Change of Arg.} = \Delta t + \frac{\Delta t}{100} \cdot \frac{d \Delta \text{Arg.}}{dt} - i \times \text{Period};$$

it being remarked that the second term is given in units of the last place of decimals.

Date.	Δg	Diff.	Δ 32	Δ 33	$\frac{d\Delta g}{dt}$	$\frac{d\Delta 32}{dt}$	$\frac{d\Delta 33}{dt}$
1630	3289	15	580	539	. . .	. . .	. . .
31	3304	18	581	540	. . .	. . .	. . .
32	3322	21	583	542	. . .	. . .	. . .
33	3343	25	585	544	. . .	. . .	. . .
34	3368	28	588	547	. . .	. . .	. . .
35	3396	32	591	550	. . .	. . .	. . .
36	3428	36	595	554	. . .	. . .	. . .
37	3464	39	600	557	. . .	. . .	. . .
38	3503	42	604	562	. . .	. . .	. . .
39	3545	45	609	566	. . .	. . .	. . .
1640	3590	47	614	571	. . .	. . .	. . .
41	3637	49	619	576	. . .	. . .	. . .
42	3686	52	624	582	. . .	. . .	. . .
43	3738	55	630	587	. . .	. . .	. . .
44	3793	58	637	593	. . .	. . .	. . .
45	3851	61	644	599	. . .	. . .	. . .
46	3912	63	651	606	. . .	. . .	. . .
47	3975	66	658	613	. . .	. . .	. . .
48	4041	69	666	620	. . .	. . .	. . .
49	4110	72	674	627	. . .	. . .	. . .
1650	4182	75	683	635	. . .	. . .	. . .
51	4257	78	691	643	. . .	. . .	. . .
52	4335	81	700	651	. . .	. . .	. . .
53	4416	84	709	659	. . .	. . .	. . .
54	4500	86	719	668	. . .	. . .	. . .
55	4586	88	729	677	. . .	. . .	. . .
56	4674	89	740	687	. . .	. . .	. . .
57	4763	91	750	696	. . .	. . .	. . .
58	4854	93	761	706	. . .	. . .	. . .
59	4947	96	772	716	. . .	. . .	. . .
1660	5043	98	782	726	. . .	. . .	. . .
61	5141	100	793	737	. . .	. . .	. . .
62	5241	102	805	748	. . .	. . .	. . .
63	5343	104	817	758	. . .	. . .	. . .
64	5447	107	829	769	. . .	. . .	. . .
65	5554	109	841	780	. . .	. . .	. . .
66	5663	111	854	792	. . .	. . .	. . .
67	5774	113	866	805	. . .	. . .	. . .
68	5887	115	879	817	. . .	. . .	. . .
69	6002	117	892	830	. . .	. . .	. . .
1670	6119	118	905	842	. . .	. . .	. . .
71	6237	119	918	855	. . .	. . .	. . .
72	6356	120	932	867	. . .	. . .	. . .
73	6476	122	947	880	. . .	. . .	. . .
74	6598	123	961	893	. . .	. . .	. . .
75	6721	124	975	907	. . .	. . .	. . .
76	6845	125	990	920	. . .	. . .	. . .
77	6970	126	1004	933	− 36.5	+ 8.1	+ 1.8
78	7096	127	1019	947	35.7	8.1	1.8
1679	7223	128	1033	960	− 34.9	+ 8.1	+ 1.9

Date.	Δg	Diff.	Δ 32	Δ 33	$\frac{d\Delta g}{dt}$	$\frac{d\Delta 32}{dt}$	$\frac{d\Delta 33}{dt}$
1680	7351	129	1049	973	− 34.1	+ 8.1	+ 1.9
81	7480	129	1064	987	33.4	8.1	1.9
82	7609	130	1079	1001	32.6	8.1	2.0
83	7739	130	1094	1015	31.9	8.1	2.0
84	7869	131	1109	1029	31.2	8.1	2.0
85	8000	131	1124	1043	30.5	8.0	2.0
86	8131	131	1139	1057	29.9	8.0	2.0
87	8262	132	1154	1071	29.3	7.9	2.0
88	8394	132	1169	1085	28.7	7.9	2.1
89	8526	132	1185	1099	28.1	7.8	2.1
1690	8658	131	1200	1113	− 27.5	+ 7.8	+ 2.1
91	8789	131	1215	1127	. .	. .	. .
92	8920	131	1230	1142	. .	. .	. .
93	9051	131	1245	1156	. .	. .	. .
94	9182	130	1260	1170	. .	. .	. .
95	9312	130	1275	1184	. .	. .	. .
96	9442	129	1290	1198	. .	. .	. .
97	9571	129	1305	1212	. .	. .	. .
98	9700	128	1320	1226	. .	. .	. .
1699	9828	128	1335	1240	. .	. .	. .
1700	9956	127	1349	1254	− 23.2	+ 7.3	+ 2.1
01	10083	126	1364	1268	22.8	7.3	2.1
02	10209	124	1378	1281	22.5	7.2	2.1
03	10333	123	1393	1295	22.2	7.2	2.0
04	10456	122	1407	1308	22.0	7.1	2.0
05	10578	120	1421	1321	21.8	7.0	2.0
06	10698	118	1435	1334	21.6	6.9	2.0
07	10816	117	1449	1346	21.4	6.9	1.9
08	10933	115	1462	1358	21.3	6.8	1.9
09	11048	113	1475	1370	21.2	6.7	1.9
1710	11161	113	1488	1382	21.1	6.6	1.9
11	11274	112	1500	1394	21.1	6.5	1.9
12	11386	109	1513	1406	21.1	6.4	1.8
13	11495	107	1526	1417	21.0	6.3	1.8
14	11602	105	1538	1428	21.0	6.2	1.7
15	11707	102	1551	1439	21.0	6.1	1.7
16	11809	100	1563	1450	21.0	6.0	1.6
17	11909	97	1574	1461	21.0	5.9	1.6
18	12006	95	1585	1471	21.1	5.8	1.5
19	12101	92	1596	1481	21.1	5.7	1.5
1720	12193	89	1607	1491	21.1	5.6	1.4
21	12282	87	1617	1500	21.2	5.5	1.4
22	12369	84	1627	1510	21.3	5.4	1.3
23	12453	82	1637	1519	21.4	5.3	1.3
24	12535	80	1647	1528	21.6	5.2	1.2
25	12615	77	1656	1537	21.8	5.1	1.2
26	12692	75	1665	1545	22.0	5.0	1.1
27	12767	72	1673	1553	22.2	4.8	1.0
28	12839	69	1682	1562	22.5	4.7	1.0
1729	12908	66	1690	1569	− 22.8	+ 4.6	+ 0.9

Date.	Δg	Diff.	Δ 32	Δ 33	$\frac{d\Delta g}{dt}$	$\frac{d\Delta 32}{dt}$	$\frac{d\ 33}{dt}$
1730	12974	61	1697	1576	− 23.1	+ 4.4	+ 0.8
31	13035	58	1705	1583	23.4	4.3	0.8
32	13093	55	1711	1590	23.7	4.2	0.7
33	13148	52	1718	1596	24.0	4.0	0.6
34	13200	49	1724	1601	24.4	3.9	0.5
35	13249	45	1730	1607	24.7	3.7	0.4
36	13294	42	1735	1612	25.0	3.6	0.4
37	13336	38	1740	1616	25.3	3.4	0.3
38	13374	36	1744	1620	25.7	3.3	0.2
39	13410	32	1748	1624	26.0	3.1	+ 0.1
1740	13442	28	1752	1627	26.4	3.0	0.0
41	13470	24	1755	1630	26.8	2.9	− 0.1
42	13494	21	1758	1633	27.2	2.8	0.2
43	13515	17	1760	1635	27.6	2.6	0.3
44	13532	14	1762	1637	28.0	2.5	0.4
45	13546	10	1764	1638	28.4	2.3	0.5
46	13556	7	1765	1640	28.8	2.1	0.6
47	13563	+ 3	1766	1641	29.3	2.0	0.7
48	13566	− 1	1766	1641	29.7	1.8	0.8
49	13565	4	1766	1640	30.1	1.7	0.9
1750	13561	8	1765	1640	30.5	1.5	1.0
51	13553	12	1764	1639	30.9	1.4	1.1
52	13541	15	1762	1638	31.3	1.2	1.2
53	13526	19	1760	1636	31.8	1.1	1.3
54	13507	23	1758	1634	32.2	0.9	1.4
55	13484	26	1756	1631	32.6	0.8	1.5
56	13458	30	1753	1628	33.0	0.6	1.5
57	13428	34	1750	1625	33.4	0.5	1.6
58	13394	37	1746	1621	33.8	0.3	1.7
59	13357	42	1742	1617	34.2	+ 0.2	1.8
1760	13315	45	1737	1612	34.6	0.0	1.9
61	13270	48	1732	1608	35.0	− 0.2	2.0
62	13222	52	1727	1603	35.4	0.3	2.0
63	13170	55	1721	1597	35.8	0.5	2.1
64	13115	59	1715	1591	36.1	0.6	2.2
65	13056	62	1708	1585	36.5	0.8	2.3
66	12994	66	1701	1578	36.9	0.9	2.3
67	12928	69	1693	1571	37.2	1.0	2.4
68	12859	72	1685	1564	37.6	1.1	2.5
69	12787	76	1677	1557	38.0	1.2	2.6
1770	12711	80	1668	1549	38.3	1.4	2.7
71	12631	83	1658	1540	38.6	1.5	2.7
72	12548	86	1649	1531	38.9	1.7	2.8
73	12462	89	1639	1522	39.2	1.9	2.9
74	12373	92	1629	1512	39.5	2.0	3.0
75	12281	95	1618	1502	39.8	2.1	3.0
76	12186	98	1607	1492	40.0	2.3	3.1
77	12088	101	1595	1481	40.3	2.5	3.2
78	11987	104	1584	1471	− 40.6	− 2.7	− 3.3
79	11883	−107	. . .	. . .	. .	. .	. .
1780	11776		. . .	. . .	. .	. .	. .

The terms omitted were as follows:—

For all the Arabian observations and for those of PTOLEMY, all the double-entry tables were omitted.

From 1621 to 1666, Tables XXII to XXXVIII of double-entry were omitted.

In all cases of such omission, the sum of the constants included in the tables was added.

From 1671 onward, all the tables were included.

Still another modification consists in the omission of the nutation. Since the comparison of the place of the moon with that of the sun or star was made in longitude, the equinox to which each was referred was indifferent; the mean equinox of the date has therefore been chosen. The nutation terms being given in Tables VII and IX of *Longitude Vrai,* these tables were omitted, andthe sum of the constants, 0°.00550, substituted.

After the formation of the arguments, the computations of longitude, latitude, and parallax were made in duplicate by two independent computers, and the work was then compared by myself. Where differences of importance were found, the computer who was wrong corrected his work without reference to that of the other. That these precautions have secured absolute freedom from error cannot be asserted. Discrepancies of various sorts, which developed themselves in the final results, led to the discovery of some errors which escaped all the preliminary examination, and which are worthy of mention as affording hints to others. In one instance, an error of 20 days in forming an argument, though marked as wrong, failed to be corrected. About half a group of latitudes (dates 83 to 91) were in error from this cause. In another instance, some inadvertence in attempting to correct an error led to a common error in two computations. In a third instance, a typographical error in the tables led to both computations of longitude being wrong by about 20″.*

This last source of error is that which I now most fear. Through some oversight, some of the volumes of tables used by the computers did not have the typographical errors corrected. Such errors in the longitude, if important, will admit of detection where two longitudes with the different variations are computed for the same day; and it was by comparing the difference of two longitudes with the variations that the mistake above mentioned was found.

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* In my preliminary paper in the *American Journal of Science and Arts* for September, 1870, the occultation of Aldebaran on 1680, November 7, appears as unaccountably discordant. The difficulty arose from a typographical error of 1′ in the tabular principal term of latitude.

Year.	Date.	Greenwich Mean Time.	Sun's Geocentric—		Moon's Geocentric—			Parallax.
			Longitude. Mean Equin.	Semidiam.	Longitude. Mean Equin.	Motion in $0^d.01$.	Latitude.	
		h m s	° ′ ″	′ ″	° ′ ″	′ ″	° ′ ″	′ ″
− 720	Mar. 19	5 0 0	351 31 30.4	15 57	170 59 20.9	7 34.32	+ 0 3 39	55 44
− 719	Mar. 8	8 0 0	340 41 49.4	16 0	160 30 21.7	7 6.02	+ 0 46 42	53 55
− 719	Sept. 1	3 0 0	150 54 28.0	16 0	329 55 25.4	9 4.97	− 0 37 45	61 10
− 620	April 21	13 0 0	24 23 36.8	15 49	204 16 11.0	7 6.78	+ 0 52 50	54 2
− 522	July 16	8 0 0	106 33 14.6	15 48	286 37 12.1	7 11.10	− 0 40 53	54 14
− 501	Nov. 19	8 0 0	231 54 14.6	16 16	51 46 47.6	7 5.02	+ 0 50 43	53 51
− 490	April 25	7 0 0	28 31 25.9	15 49	207 55 48.9	8 7.91	+ 1 1 36	57 48
− 382	Dec. 22	16 0 0	267 1 57.5	16 17	86 46 52.5	8 42.95	− 0 57 49	59 52
− 381	June 18	4 0 0	80 27 49.9	15 45	259 47 0.2	7 10.34	+ 0 46 28	54 11
− 381	Dec. 12	6 0 0	256 9 56.4	16 17	75 12 47.0	9 8.24	− 0 21 10	61 20
− 200	Sept. 22	5 0 0	176 0 41.3	16 4	356 20 25.1	7 28.60	+ 0 33 22	55 22
− 199	Mar. 19	8 0 0	355 22 22.6	15 58	173 56 22.8	8 16.66	+ 0 4 54	58 19
− 199	Sept. 11	10 0 0	165 1 43.1	16 2	343 55 3.4	8 19.93	+ 0 0 7	58 30
− 173	April 30	10 0 0	35 40 6.5	15 49	214 45 55.5	9 4.43	− 0 35 42	61 5
− 140	Jan. 27	6 0 0	304 31 56.5	16 12	123 26 23.7	9 8.10	+ 0 46 34	61 20
+ 125	April 5	6 0 0	14 16 11.9	15 54	194 2 38.5	8 18.60	+ 0 57 26	58 26
133	May 6	8 0 0	44 11 33.5	15 48	223 56 8.0	7 20.03	− 0 25 40	54 50
134	Oct. 20	8 0 0	206 15 6.2	16 11	25 54 53.2	7 33.38	− 0 26 45	55 40
136	Mar. 5	12 0 0	344 36 35.8	16 2	163 51 50.9	8 53.27	− 0 53 11	60 28
829	Nov. 29	16 36 14	252 37 1.4	16 15	251 37 35.6	7 51.53	+ 0 22 7	56 54
829	Nov. 29	18 26 54	252 41 43.2	16 15	252 38 3.6	7 52.27	+ 0 16 49	56 56
854	Aug. 11	12 1 7	142 35 22.2	15 52	321 40 19.9	8 48.28	+ 0 18 14	60 16
856	June 21	12 21 58	94 10 35.2	15 45	273 34 30.6	8 15.06	− 0 45 12	58 14
923	June 1	6 56 33	74 43 21.5	15 46	255 29 51.2	8 37.30	− 0 43 50	59 34
923	Nov. 10	16 21 8	233 26 48.7	16 14	232 37 16.1	9 4.21	+ 0 32 23	61 16
923	Nov. 10	17 32 32	233 29 49.5	16 14	233 22 23.0	9 4.07	+ 0 28 14	61 11
925	April 11	2 38 36	26 7 56.1	15 54	204 16 46.0	8 25.73	+ 0 36 51	58 57
925	April 11	7 47 49	26 20 32.1	15 54	207 18 22.5	8 27.80	+ 0 20 2	59 6
927	Sept. 13	12 50 46	175 11 58.9	16 0	354 28 43.6	9 5.48	+ 0 51 14	61 17
928	Aug. 17	15 29 29	149 36 57.7	15 53	149 7 31.6	7 51.39	− 0 13 10	56 54
929	Jan. 27	8 5 32	313 14 7.1	16 13	131 48 27.9	8 30.55	+ 0 30 37	59 17
933	Nov. 4	13 17 45	227 48 52.7	16 13	46 54 43.2	7 14.45	− 0 5 53	54 31
977	Dec. 12	18 19 2	267 1 39.0	16 17	265 49 0.2	9 6.65	+ 0 35 14	61 25
977	Dec. 12	20 36 10	267 7 28.7	16 17	267 16 6.2	9 6.38	+ 0 27 16	61 25
978	June 8	0 22 29	81 48 51.6	15 45	81 58 28.1	7 6.24	− 0 6 10	53 57
978	June 8	2 42 13	81 54 24.5	15 45	83 7 17.5	7 5.97	+ 0 0 16	53 58
979	May 14	5 52 0	57 56 59.6	15 48	238 51 9.2	8 18.24	+ 0 32 26	58 31
979	May 28	4 12 58	71 15 6.9	15 46	71 47 32.3	7 36.34	+ 0 39 3	55 55
979	Nov. 6	8 3 40	229 27 8.9	16 13	48 42 43.9	8 18.33	− 0 37 36	58 34
979	Nov. 6	11 18 0	229 35 21.4	16 13	50 34 49.0	8 17.20	− 0 27 15	58 28
980	May 2	14 26 0	47 31 15.6	15 49	228 24 21.3	7 28.20	− 0 12 2	55 26
981	April 21	13 28 0	36 39 56.3	15 52	216 14 56.3	7 5.32	− 0 45 50	53 55
981	Oct. 15	14 7 0	208 1 33.9	16 8	27 24 21.5	9 2.06	+ 0 46 36	61 7
983	Mar. 1	9 55 0	346 13 18.5	16 5	165 18 39.2	8 38.20	+ 0 31 50	59 42
983	Mar. 1	13 40 0	346 22 36.4	16 5	167 33 27.9	8 36.75	+ 0 19 24	59 35
985	July 20	2 56 30	122 17 35.7	15 47	122 43 17.6	8 10.32	+ 0 15 4	58 1
985	July 20	4 18 13	122 20 51.7	15 48	123 29 43.1	8 10.89	+ 0 10 50	58 3
986	Dec. 18	14 53 0	272 49 1.0	16 17	92 16 49.4	7 5.90	+ 0 30 16	53 58
990	April 12	7 42 0	27 34 15.2	15 54	206 43 56.9	7 6.15	− 0 37 29	53 59
990	April 12	11 4 0	27 42 24.7	15 54	208 23 26.7	7 5.94	− 0 28 17	53 59
993	Aug. 19	17 36 5	151 54 39.6	15 53	150 28 33.5	9 2.40	+ 0 5 17	61 4
1002	Mar. 1	9 41 18	346 35 57.9	16 5	165 37 27.9	9 8.07	− 0 12 7	61 27
1004	Jan. 23	1 51 0	308 43 17.5	16 14	296 1 56.8	8 32.44	− 1 2 7	59 20
1004	Jan. 24	1 51 0	309 44 2.2	16 14	310 9 24.9	8 23.57	+ 0 15 51	58 50

No.	Date.	Greenwich Mean Time.		Geocentric Long. of Moon.	Motion in $0^d.01$.	Geocentric Lat. of Moon.	Motion in $0^d.01$.	Parallax.	Motion in $0^d.01$.
		h m s		° ′ ″	′ ″	° ′ ″	″	′ ″	″
1	1621, May 20	18 39 34	.7774768	59 5 58.7	7 53.11	+ 0 45 26.4	− 43.19	56 58.5	. .
2	" "	21 5 10	.8787879	60 25 46.4	7 54.05	+ 0 38 8.1	− 43.38	57 1.9	. .
3	1623, July 5	9 24 16	.3918519	198 24 43.4	8 18.02	− 0 47 52.7	+ 43.42	58 42.7	. .
4	1627, June 17	10 8 14	.4223843	144 51 53.2	7 51.53	+ 1 25 49.9	+ 40.95	57 5.9	. .
4*a*	" Sept. 18	10 29 20	.4370371	278 37 23.8	7 19.99	+ 2 26 51.8	− 34.76	55 8.7	. .
5	1630, June 10	4 48 0	.2000000	79 1 13.7	8 5.21	+ 0 32 57.7	+ 44.54	57 42.8	. .
6	" "	7 12 0	.3000000	80 22 11.4	8 6.25	+ 0 40 22.9	+ 44.49	57 46.4	. .
7	1632, Feb. 5	15 0 0	.6250000	136 25 3.0	7 58.98	+ 4 58 21.5	− 4.52	57 6.5	. .
8	1633, Feb. 14	11 20 4	.4722685	46 6 19.3	7 22.22	+ 2 18 28.6	+ 35.28	55 20.4	. .
9	" Apr. 8	4 48 0	.2000000	20 7 46.5	7 53.90	+ 0 12 4.5	+ 43.74	57 1.8	. .
10	1634, Dec. 30	5 43 44	.2387037	54 24 14.8	8 11.76	+ 4 46 35.3	+ 14.18	58 0.3	. .
11	1635, Aug. 26	9 24 22	.3919155	316 31 29.9	8 37.00	− 1 26 4.5	+ 45.97	59 35.6	. .
12	1637, Mar. 29	9 0 0	.3750000	55 14 22.7	8 38.44	+ 4 38 12.3	− 17.99	59 35.6	. .
13	1638, Jan. 24	7 17 49	.3040394	54 34 6.4	8 17.34	+ 4 7 54.9	− 28.45	58 33.6	. .
14	" Dec. 20	16 7 42	.6720139	90 38 16.8	8 32.60	− 0 15 9.0	− 47.36	59 20.0	. .
15	1639, Apr. 7	9 0 21	.3752431	67 33 17.6	7 36.62	+ 1 7 55.4	− 39.45	56 6.9	. .
16	" June 1	3 36 0	.1500000	70 37 53.0	7 50.59	+ 0 43 53.6	− 42.99	56 49.9	. .
17	" "	6 0 0	.2500000	71 56 22.8	7 51.67	+ 0 36 42.3	− 43.19	56 53.4	. .
17*a*	1641, Apr. 13	8 3 43	.3359143	63 55 47.3	7 5.41	− 1 58 40.0	− 36.37	54 1.8	. .
18	1644, Nov. 14	15 36 0	.6500000	66 15 48.3	9 4.03	− 5 0 36.6	+ 1.70	60 55.8	. .
19	1645, Aug. 21	0 0 0	.0000000	148 42 39.6	8 7.94	+ 0 51 18.0	+ 44.41	57 52.7	. .
20	" "	3 0 0	.1250000	150 24 10.0	8 6.94	+ 1 0 31.5	+ 44.07	57 48.0	. .
21	" Oct. 7	15 0 0	.6250000	51 21 48.1	8 52.87	− 5 4 6.1	+ 3.08	60 20.1	. .
21*a*	" Oct. 8	12 0 0	.5000000	64 6 43.9	8 49.06	. . .	. .	. .	. .
21½	" "	15 0 0	.6250000	66 6 7.5	8 48.26	− 4 49 3.7	+ 14.86	60 4.2	. .
22	1647, Jan. 20	14 24 0	.6000000	123 56 43.0	9 9.47	+ 1 6 32.9	+ 49.66	61 28.5	. .
23	" Apr. 12	10 0 0	.4166667	119 30 52.4	8 28.18	+ 1 7 14.6	+ 43.68	59 17.0	. .
24	1652, Apr. 7	21 36 0	.9000000	18 36 33.0	8 48.80	+ 0 43 31.2	+ 48.40	60 17.1	. .
25	" Apr. 8	0 0 0	.0000000	20 4 37.0	8 48.08	+ 0 51 24.3	+ 48.11	60 14.1	. .
26	1654, Aug. 11	20 0 0	.8333333	138 21 50.1	8 24.22	+ 0 36 22.6	− 46.22	58 51.1	. .
27	" "	22 24 0	.9333333	139 45 47.6	8 23.28	+ 0 28 40.1	− 46.36	58 47.4	. .
28	1656, Jan. 26	0 30 0	.0208333	306 8 52.3	7 4.33	+ 0 47 56.6	+ 38.83	53 56.3	. .
29	" "	2 54 0	.1208333	307 19 35.1	7 4.30	+ 0 55 24.2	+ 38.66	53 56.1	. .
30	" Mar. 1	7 20 9	.3056597	44 7 19.2	7 44.94	+ 4 54 8.4	− 12.55	56 29.5	. .
31	1658, Oct. 14	9 52 6	.4111806	61 25 33.8	7 4.01	+ 0 8 6.6	− 38.48	54 2.5	. .
32	1660, Apr. 26	13 23 51	.5582292	238 38 39.5	8 21.52	+ 2 8 20.1	+ 42.28	58 40.5	. .
33	" June 17	9 41 39	.4039236	199 0 32.9	7 41.30	− 1 16 33.8	+ 40.01	56 30.8	. .
34*a*	1661, Mar. 29	21 0 0	.8750000	9 36 33.8	8 59.10	+ 0 37 16.9	− 49.48	60 51.9	. .
34*b*	" "	23 24 0	.9750000	11 6 20.2	8 58.50	+ 0 29 0.8	− 49.54	60 49.8	. .
34	" Mar. 30	21 0 0	.8750000	24 28 26.1	8 50.64	− 0 45 6.6	− 48.65	60 24.6	. .
35	" "	23 24 0	.9750000	25 56 45.6	8 49.52	− 0 53 30.8	− 48.24	60 20.7	. .
36	" Aug. 3	7 15 0	.3020833	227 8 42.2	7 25.10	+ 3 9 50.3	+ 31.35	55 28.4	. .
37	1663, Mar. 14	8 0 0	.3333333	62 53 20.6	8 37.57	− 5 13 51.0	− 5.63	59 33.8	. .
38	" Aug. 18	8 0 57	.3339931	325 32 18.9	7 41.56	+ 0 28 5.2	− 42.46	56 16.5	. .
39	" "	8 50 52	.3686574	325 58 59.1	7 41.92	+ 0 25 26.0	− 42.57	56 17.7	. .
40	1664, Mar. 31	8 25 0	.3506944	65 40 39.2	8 28.75	− 4 55 29.4	+ 12.18	59 1.5	. .
41	1666, July 1	17 36 0	.7333333	99 13 35.0	7 58.12	+ 0 20 14.2	+ 44.01	57 17.4	. .
42	" "	20 0 0	.8333333	100 33 20.2	7 59.12	+ 0 27 34.9	+ 44.07	57 21.1	. .
43	1671, Mar. 14	7 46 0	.3236111	46 28 53.4	8 45.24	+ 3 35 31.6	+ 35.52	60 7.6	. .

No.	Date.	Greenwich Mean Time.		Geocentric Long. of Moon.	Motion in 0d.01.	Geocentric Lat. of Moon.	Motion in 0d.01.	Parallax.	Motion in 0d.01.
		h m s		° ′ ″	′ ″	° ′ ″	″	′ ″	″
44	1671, Mar. 14	8 37 0	.3590278	46 59 53.3	8 44.81	+ 3 37 37.1	+ 35.24	60 6.3	. .
45	" Apr. 22	9 29 0	.3951389	198 38 41.2	7 5.02	− 1 21 13.2	− 37.49	53 59.5	. .
46	" "	10 39 0	.4437500	199 13 6.3	7 5.02	− 1 24 15.0	− 37.41	53 59.2	. .
47	" May 31	14 21 0	.5979167	348 27 34.7	8 19.36	− 1 6 46.2	+ 43.20	58 47.2	. .
48	1672, May 18	18 24 30	.7670139	320 33 46.2	7 29.06	− 1 50 16.8	+ 36.84	55 46.1	. .
49	" "	20 3 30	.8357639	321 25 5.9	7 29.86	− 1 46 2.1	+ 37.22	55 49.0	. .
50	" Aug. 2	10 18 20	.4293982	246 54 50.5	7 7.97	− 5 13 26.2	+ 0.18	54 10.8	. .
51	" Sept. 25	10 7 36	.4219445	238 50 21.1	7 16.61	− 5 10 27.3	− 4.88	54 41.6	. .
52	" Nov. 5	11 30 0	.4791667	54 52 19.4	8 56.47	+ 4 58 1.2	+ 6.87	60 29.8	. .
53	1673, Mar. 22	7 0 0	.2916667	55 35 37.6	8 18.06	+ 5 10 53.3	+ 0.66	58 23.2	. .
54	1674, Aug. 23	12 36 0	.5250000	54 25 9.4	7 33.17	+ 4 42 45.4	− 17.43	55 51.8	+ 0.45
55	" "	13 48 0	.5750000	55 2 57.5	7 33.71	+ 4 41 20.9	− 17.85	55 54.2	. .
56	1675, Jan. 11	7 0 0	.2916667	111 34 22.0	8 26.16	− 0 6 35.2	− 46.83	58 57.6	. .
57	" "	8 12 0	.3416667	112 16 34.3	8 26.77	− 0 10 29.4	− 46.87	58 59.3	. .
58	" June 22	16 0 0	.6666667	90 46 2.8	7 43.89	+ 0 56 49.6	− 42.09	56 24.7	. .
59	" "	17 12 0	.7166667	91 24 43.2	7 44.26	+ 0 53 18.8	− 42.15	56 26.3	. .
60	1676, Feb. 29	10 22 57	.4326042	169 3 17.1	8 38.29	− 4 56 59.6	− 7.80	59 25.8	. .
61	" "	11 20 3	.4722570	169 37 32.6	8 38.62	− 4 57 31.9	− 7.42	59 26.9	. .
62	" Mar. 18	7 16 28	.3031019	47 50 0.3	7 5.74	+ 3 9 51.1	− 29.00	54 7.0	. .
63	" Mar. 23	13 17 20	.5537038	110 50 36.5	7 32.52	− 2 4 28.3	− 36.37	55 57.5	. .
64	" June 10	20 0 0	.8333333	80 13 23.4	7 8.10	+ 0 13 46.0	− 39.58	54 11.9	. .
65	" "	22 24 0	.9333333	81 24 46.6	7 8.47	+ 0 7 9.5	− 39.62	54 13.1	. .
66	" June 29	11 29 59	.4791551	334 57 26.9	8 0.24	+ 5 1 25.2	+ 13.30	57 25.3	. .
67*a*	" Aug. 19	8 24 0	.3500000	280 17 41.7	8 30.70	+ 1 43 7.6	+ 42.61	59 18.2	. .
67	" "	12 0 0	.5000000	282 25 22.2	8 30.52	+ 1 53 42.1	+ 41.95	59 16.7	+ 0.27
68	" Aug. 31	12 0 0	.5000000	77 16 55.7	7 5.81	+ 0 10 11.4	− 37.71	54 19.3	. .
69	" "	14 24 0	.6000000	78 27 55.5	7 6.02	+ 0 3 54.3	− 37.79	54 20.3	+ 0.08
70	" Sept. 26	17 30 24	.7294444	64 16 57.3	7 5.41	+ 1 3 17.4	− 36.91	54 13.5	. .
71	" Nov. 9	5 40 55	.2367476	281 53 33.0	8 42.36	+ 2 28 36.5	+ 42.34	60 1.3	. .
72	" "	6 35 19	.2745254	282 26 25.5	8 41.89	+ 2 31 16.0	+ 42.06	59 59.8	. .
73	1677, Mar. 9	12 17 7	.5118886	64 39 50.8	7 10.02	+ 0 16 32.4	− 38.05	54 34.8	. .
74	1678, Feb. 27	7 21 0	.3062500	63 40 50.7	7 30.25	− 1 18 24.0	− 38.51	55 52.3	. .
75	" "	8 33 0	.3562500	64 18 21.3	7 29.64	− 1 21 36.7	− 38.40	55 50.1	. .
76	" Mar. 28	8 0 0	.3333333	84 31 3.1	7 22.44	− 3 11 13.0	− 31.55	55 16.8	. .
77	" Sept. 24	7 6 32	.2962038	284 49 30.4	8 24.43	+ 4 48 9.2	+ 17.43	58 54.0	. .
78	" Oct. 29	8 35 38	.3580787	37 3 53.8	8 32.75	− 0 0 59.9	− 47.41	59 20.6	. .
79	1679, Mar. 29	13 36 0	.5666667	220 9 55.3	7 16.28	+ 1 9 1.8	+ 39.25	54 46.5	. .
80	" "	16 0 0	.6666667	221 22 42.0	7 17.00	+ 1 15 34.0	+ 39.13	54 48.7	. .
81	" June 4	15 1 30	.6260416	30 4 4.0	8 34.62	− 0 17 59.6	− 46.33	59 32.9	. .
82	" "	16 0 0	.6666667	30 38 54.6	8 34.55	− 0 21 7.6	− 46.28	59 32.6	. .
83	" June 24	9 51 42	.4109028	284 41 24.6	8 16.01	+ 4 57 36.9	+ 7.89	58 8.5	. .
84	" "	10 32 29	.4392245	285 4 50.0	8 16.26	+ 4 57 58.9	+ 7.61	58 9.4	. .
85	1680, Jan. 16	9 1 21	.3759375	128 15 55.5	7 55.78	− 4 31 28.2	+ 17.99	56 56.7	. .
86	" "	10 7 1	.4215394	128 52 2.9	7 55.16	− 4 30 05.0	+ 18.33	56 54.9	. .
87	" Apr. 4	10 18 22	.4294213	91 23 11.7	8 19.25	− 5 14 43.4	− 6.41	58 33.3	. .
88	" Sept. 13	15 0 53	.6256134	64 54 25.7	8 35.38	− 4 46 29.7	− 20.27	59 30.0	. .
89	" Nov. 7	7 50 43	.3268866	64 33 16.1	9 9.83	− 4 39 27.6	− 20.47	61 18.4	. .
90	1681, Jan. 1	6 27 41	.2692245	64 53 53.2	8 58.16	− 4 45 23.1	− 15.37	60 40.3	. .
91	" "	7 36 41	.3171412	65 36 51.3	8 58.45	− 4 46 35.7	− 14.86	60 41.2	. .

No.	Date.	Greenwich Mean Time.		Geocentric Long. of Moon.	Motion in $0^d.01$.	Geocentric Lat. of Moon.	Motion in $0^d.01$.	Parallax.	Motion in $0^d.01$.
		h m s		° ′ ″	′ ″	° ′ ″	″	′ ″	″
92	1682, Feb. 15	7 4 31	.2948033	63 27 54.5	8 21.37	− 5 17 40.1	+ 0.80	58 40.1	. .
93	“ Mar. 14	9 45 35	.4066551	61 48 36.0	8 14.82	− 5 14 55.9	− 0.43	58 13.8	. .
94	“ “	10 57 35	.4566551	62 29 50.4	8 15.14	− 5 14 56.7	+ 0.03	58 15.2	. .
95	1683, Jan. 9	8 41 32	.3621759	65 19 27.0	8 18.13	− 4 54 29.8	+ 15.99	58 25.3	. .
96	“ “	9 54 47	.4130440	66 1 42.3	8 19.14	− 4 53 6.5	+ 16.59	58 28.1	. .
97	“ Feb. 5	11 57 42	.4984027	61 51 25.5	7 58.01	− 5 3 33.0	+ 13.24	50 20.7	. .
98	“ “	12 47 44	.5331482	62 19 7.6	7 58.66	− 5 2 46.4	+ 13.63	57 22.7	. .
99	“ Apr. 2	8 43 44	.3637037	79 16 42.7	7 54.48	− 4 3 47.7	+ 25.18	57 7.8	. .
100	“ “	9 43 34	.4052546	79 49 34.9	7 54.84	− 4 2 1.7	+ 25.56	57 9.4	. .
101	“ May 4	9 55 23	.4134606	145 25 17.1	8 29.87	+ 1 24 1.1	+ 43.16	59 22.3	. .
102	“ “	10 40 55	.4450811	145 52 10.3	8 30.05	+ 1 26 17.7	+ 43.11	59 22.9	. .
103	1684, July 12	2 16 0	.0944444	110 36 32.9	7 55.60	+ 0 20 56.7	+ 43.79	57 7.9	. .
104	“ “	4 40 0	.1944445	111 55 53.3	7 56.53	+ 0 28 15.1	+ 43.80	57 11.4	. .
105	“ Dec. 21	9 24 59	.3923496	90 28 46.8	7 21.68	− 0 39 6.3	+ 40.50	55 1.2	. .
106	“ “	10 0 59	.4173496	90 47 11.0	7 21.83	− 0 37 24.8	+ 40.58	55 1.8	. .
107	1685, Oct. 17	9 29 28	.3954630	85 44 7.8	7 3.68	+ 0 26 56.1	+ 37.92	54 8.1	. .
108	1686, Apr. 10	9 33 29	.3982523	230 0 25.1	8 31.42	+ 1 51 9.8	− 42.78	59 16.3	. .
109	“ “	10 45 29	.4482523	230 43 2.6	8 31.63	+ 1 47 35.3	− 42.99	59 17.3	. .
110	“ June 25	9 45 41	.4067245	149 21 46.0	7 14.74	+ 5 8 36.7	+ 7.17	54 35.3	. .
111	“ July 2	9 13 35	.3844329	240 53 20.4	8 42.11	+ 0 49 10.9	− 47.12	60 1.9	. .
112	1687, Mar. 28	13 30 37	.5629282	189 6 30.7	7 27.08	+ 3 31 22.9	− 29.07	55 15.7	. .
113	“ May 11	1 0 0	.0416667	51 0 17.9	8 3.84	− 0 3 55.5	+ 44.69	57 38.1	. .
114	“ “	2 12 0	.0916667	51 40 36.1	8 3.30	− 0 0 12.1	+ 44.63	57 36.2	. .
115	1689, May 21	9 29 11	.3952662	100 17 0.4	8 40.67	+ 5 7 29.9	+ 2.94	59 42.1	. .
116	“ Sept. 13	3 20 0	.1388889	171 20 55.5	7 37.78	+ 1 19 54.6	− 40.86	56 1.5	. .
117	“ “	4 32 0	.1888889	171 59 3.4	7 37.31	+ 1 16 30.4	− 40.87	55 59.9	. .
118	1690, Apr. 13	11 28 55	.4784143	86 7 20.7	8 41.57	+ 5 12 56.4	+ 0.17	59 47.8	. .
119	“ July 2	14 59 9	.6244097	55 17 48.6	8 47.90	+ 4 34 51.1	+ 19.48	60 11.0	. .
120	1699, Aug. 18	13 35 19	.5661921	64 56 16.9	8 27.31	− 4 57 48.5	− 14.50	59 1.6	. .
121	“ “	14 13 19	.5925810	65 18 35.3	8 27.53	− 4 58 26.7	− 14.33	59 2.6	. .
122	“ Sept. 22	20 0 0	.8333333	179 10 45.4	8 18.85	+ 0 33 20.3	+ 45.83	58 31.4	. .
123	“ “	22 24 0	.9333333	180 33 48.5	8 17.88	+ 0 40 57.7	+ 45.59	58 27.9	. .
124	1701, Aug. 23	12 0 0	.5000000	29 51 8.5	7 9.26	− 5 2 58.4	− 11.16	54 16.1	. .
125	“ “	13 12 0	.5500000	30 26 54.8	7 9.44	− 5 3 53.5	− 10.84	54 16.9	. .
126	“ Sept. 22	17 50 5	.7431134	65 49 34.4	7 23.48	− 4 49 46.9	+ 13.67	55 11.9	. .
127	“ “	18 36 24	.7752778	66 13 21.0	7 23.63	− 4 49 2.1	+ 13.98	55 13.0	. .
128	1704, July 27	1 20 0	.0555556	78 11 32.3	7 12.29	− 0 14 15.1	+ 39.03	54 36.0	. .
129	“ “	2 32 0	.1055556	78 47 32.8	7 12.04	− 0 10 59.8	+ 39.02	54 34.9	. .
130	1705, Aug. 4	15 14 37	.6351505	313 18 20.6	9 3.10	− 4 48 34.4	− 13.65	60 52.9	. .
131	“ Sept. 2	11 39 35	.4858218	334 36 37.7	9 11.81	− 4 58 22.8	+ 6.23	61 22.6	. .
132	1706, Jan. 23	11 4 14	.4612732	64 28 16.4	8 4.38	+ 1 10 23.8	+ 41.60	57 49.6	. .
133	“ “	11 40 14	.4862732	64 48 27.7	8 4.20	+ 1 12 7.8	+ 41.53	57 48.8	. .
134	“ Jan. 27	11 22 33	.4739931	117 2 23.9	7 38.50	+ 4 35 26.8	+ 15.90	55 53.8	− 0.39
135	“ Apr. 21	8 51 49	.3693172	143 36 0.9	7 18.52	+ 5 12 27.8	− 6.32	54 53.5	. .
136	“ “	9 45 24	.4065278	144 3 13.2	7 18.30	+ 5 12 3.9	− 6.58	54 52.4	. .
137	“ May 11	20 20 0	.8472222	50 15 43.5	8 55.10	+ 0 31 40.3	+ 49.21	60 39.5	. .
138	“ “	22 44 0	.9472222	51 44 50.3	8 54.53	+ 0 39 51.9	+ 48.98	60 37.2	. .
139	“ May 24	10 38 30	.4434028	212 34 39.4	7 8.44	+ 1 5 40.3	− 38.59	54 16.9	. .
140	“ Nov. 17	11 48 5	.4917246	23 58 34.0	8 58.96	− 1 3 12.8	+ 48.64	60 56.5	. .

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		h m s		° ′ ″	′ ″	° ′ ″	″	′ ″	″
141	1707, Apr. 4	8 11 52	.3415741	43 25 40.5	8 56.18	+ 1 33 35.0	+ 47.32	60 44.9	. .
142	" Sept. 3	7 37 33	.3177431	245 43 16.4	7 6.49	− 3 51 23.8	− 25.90	54 14.7	. .
143	" "	8 25 45	.3512153	246 7 3.8	7 6.42	− 3 52 50.3	− 25.68	54 14.6	. .
144	1708, Feb. 23	7 8 22	.2974769	359 32 41.6	7 52.93	− 0 46 37.3	+ 42.52	56 59.5	. .
145	" Sept. 6	9 27 6	.3938195	63 53 15.7	8 17.34	+ 4 46 48.5	+ 19.23	58 28.1	. .
146	" Sept. 13	6 30 0	.2708333	162 55 38.5	8 38.18	+ 1 26 22.1	− 45.98	59 39.0	. .
147	" "	8 54 0	.3708333	164 21 55.5	8 37.46	+ 1 18 40.8	− 46.31	59 36.2	. .
147*a*	" "	18 30 0	.7708333	170 5 36.7	8 33.83	+ 0 47 36.2	− 46.90	59 24.2	. .
147*b*	" "	20 54 0	.8708333	171 31 8.6	8 32.86	+ 0 39 46.8	− 46.94	59 20.9	. .
148	1709, Apr. 20	7 41 6	.3202083	166 46 11.2	8 34.73	+ 0 11 9.0	− 46.68	59 33.2	. .
149	" Sept. 16	10 40 0	.4444444	331 3 52.5	7 4.80	− 0 51 49.8	+ 38.69	54 0.8	. .
150	" "	11 52 0	.4944444	331 39 16.3	7 4.84	− 0 48 36.0	+ 38.76	54 0.9	. .
151	" Sept. 23	8 9 11	.3397106	54 59 50.1	7 40.33	+ 5 4 3.8	+ 11.07	56 10.2	+0.42
152	" "	8 57 11	.3730439	55 25 25.5	7 40.55	+ 5 4 40.2	+ 10.78	56 11.4	. .
153	" Dec. 14	5 0 0	.2083333	54 30 10.7	7 54.62	+ 4 57 43.4	+ 6.96	56 56.0	. .
154	" "	7 24 0	.3083333	55 49 26.6	7 56.03	+ 4 58 48.3	+ 6.02	57 0.4	. .
155	1710, Dec. 4	4 32 58	.1895602	54 42 23.6	7 19.78	+ 4 58 13.0	− 6.47	54 44.0	. .
156	" "	5 44 58	.2395602	55 19 3.7	7 20.14	+ 4 57 39.4	− 6.92	54 45.1	+0.23
157	1711, Sept. 30	15 20 0	.6388889	55 35 7.9	7 6.53	+ 4 35 39.9	− 15.51	54 4.8	. .
158	" "	17 44 0	.7388889	56 46 13.8	7 6.42	+ 4 33 0.8	− 16.20	54 4.7	. .
159	1712, May 15	11 6 58	.4631713	170 24 29.7	8 1.54	− 4 36 20.2	− 18.88	57 32.9	. .
160	" "	11 46 11	.4904051	170 46 21.9	8 2.11	− 4 37 11.6	− 18.73	57 34.4	. .
161	1713, Dec. 1	11 49 4	.4924074	68 5 59.5	7 46.49	+ 0 53 38.8	− 42.47	56 33.6	. .
162	1714, Mar. 20	9 6 39	.3796180	65 15 35.8	7 57.47	+ 0 32 12.2	− 41.93	57 29.7	. .
163	" Mar. 21	10 16 9	.4278819	78 55 26.1	7 41.20	− 0 40 13.7	− 40.50	56 32.6	. .
164	" Apr. 6	15 17 21	.6370486	278 55 14.8	8 7.33	+ 2 29 27.0	+ 38.01	58 2.8	. .
165	" "	16 30 36	.6879167	279 36 37.2	8 7.87	+ 2 32 40.6	+ 37.82	58 4.9	. .
166	" Sept. 27	9 0 40	.3754630	61 49 47.1	8 20.36	− 0 4 38.7	− 44.79	58 49.7	. .
167	" Oct. 2	14 37 51	.6096181	129 8 26.9	7 16.14	− 4 45 8.5	− 14.32	54 43.6	. .
168	1715, May 2	19 12 0	.8000000	40 47 52.7	9 3.46	+ 0 51 30.0	− 49.54	61 7.8	. .
169	" June 22	2 0 0	.0830000	337 38 50.1	8 16.84	+ 4 54 41.2	− 13.94	58 23.0	. .
170	" July 21	14 49 43	.6178588	9 59 6.5	8 29.00	+ 3 4 20.6	− 35.77	59 14.0	. .
171	" "	15 42 30	.6545139	10 30 13.4	8 29.08	+ 3 2 9.2	− 35.98	59 14.3	. .
172	" July 24	13 28 39	.5615625	51 34 10.1	8 26.88	− 0 22 52.3	− 44.78	59 10.4	. .
173	" "	14 14 26	.5933565	52 1 1.6	8 26.81	− 0 25 14.5	− 44.70	59 10.1	. .
174	" Aug. 15	11 46 34	.4906713	335 28 18.4	8 36.13	+ 4 41 49.5	− 15.78	59 21.0	. .
175	" "	12 31 41	.5220023	335 55 16.4	8 36.20	+ 4 40 59.3	− 16.26	59 21.9	. .
176	" Oct. 9	7 55 53	.3304745	335 21 17.1	8 34.69	+ 4 47 33.2	− 19.04	59 24.3	. .
177	" Dec. 30	7 17 35	.3038773	335 58 5.1	7 59.02	+ 4 32 20.1	− 18.98	57 20.4	. .
178	1717, Sept. 25	8 53 38	.3705787	65 5 39.7	8 14.12	− 4 36 58.0	− 22.10	58 13.9	. .
179	" "	9 45 58	.4069213	65 35 35.2	8 14.53	− 4 38 17.3	− 21.82	58 14.9	. .
180	1718, Jan. 15	13 24 33	.5587153	105 0 54.2	9 7.74	− 4 49 15.7	+ 14.69	61 9.9	. .
181	" Feb. 9	6 22 14	.2654398	65 35 40.9	8 12.80	− 4 53 48.8	− 15.13	58 12.6	. .
182	" Feb. 14	6 50 0	.2847222	139 19 12.4	9 10.12	− 3 4 15.8	+ 40.38	61 25.9	. .
183	" Sept. 9	8 33 19	.3564699	347 0 19.2	7 5.56	− 0 5 15.3	− 39.39	54 1.4	. .
184	1719, Apr. 22	7 33 37	.3150116	66 20 37.3	7 29.35	− 5 5 1.1	+ 0.79	55 22.4	. .
185	" "	8 23 6	.3493750	66 46 21.3	7 29.60	− 5 4 57.6	+ 1.08	55 23.3	. .
186	" Aug. 21	7 34 50	.3158565	231 6 30.9	8 26.56	+ 5 15 17.2	+ 5.46	58 59.1	. .
187	" Oct. 30	8 37 27	.3593403	65 12 51.8	7 16.36	− 4 56 10.8	+ 6.91	54 33.3	. .

No.	Date.	Greenwich Mean Time.		Geocentric Long. of Moon	Motion in 0d.01.	Geocentric Lat. of Moon.	Motion in 0d.01.	Parallax.	Motion in 0d.01.
		h m s		° ′ ″	′ ″	° ′ ″	″	′ ″	″
188	1719, Oct. 30	9 33 45	.3984375	65 41 17.7	7 16.50	− 4 55 43.1	+ 7.21	54 33.9	. . .
189	" Nov. 26	6 55 20	.2884259	61 14 15.9	7 18.70	− 4 56 4.9	+ 6.15	54 36.9	. .
190	1720, Apr. 20	12 15 0	.5104167	186 10 58.6	8 57.19	+ 3 53 48.6	+ 29.71	60 41.3	+0.20
191	" "	12 43 48	.5304167	186 28 53.3	8 57.37	+ 3 54 48.0	+ 29.57	60 42.1	+0.26
192	" Dec. 31	3 0 0	.1250000	311 24 1.9	8 36.24	− 1 2 7.0	− 46.58	59 38.3	. .
193	" "	4 12 0	.1750000	312 7 0.7	8 35.52	− 1 5 59.6	− 46.34	59 35.6	. .
194	1722, Dec. 8	1 30 0	.0625000	255 58 21.3	8 20.94	+ 0 41 39.6	− 45.88	58 38.5	. .
195	1724, May 22	5 48 0	.2416667	61 59 10.6	8 56.44	+ 0 34 11.6	+ 49.28	60 44.3	. .
196	" "	7 0 0	.2916667	62 43 51.6	8 56.18	+ 0 38 18.2	+ 49.20	60 43.2	. .
197	1725, Feb. 19	12 16 12	.5112500	60 8 2.4	8 27.28	+ 1 44 5.5	+ 42.23	59 13.0	. .
198	1726, Jan. 18	7 0 0	.2916667	128 5 17.2	9 4.72	+ 4 49 53.6	− 12.09	61 0.4	. .
199	" "	8 12 0	.3416667	128 50 40.8	9 4.25	+ 4 48 51.3	− 12.71	60 59.0	. .
200	1727, Feb. 27	6 52 30	.2864584	53 56 22.0	7 46.11	+ 4 12 43.3	+ 25.52	56 41.5	. .
201	" Sept. 6	13 48 0	.5750000	55 5 0.6	7 32.66	+ 4 44 10.5	+ 18.62	55 48.8	+0.41
202	" "	15 0 0	.6250000	55 42 46.4	7 33.17	+ 4 45 42.8	+ 18.23	55 50.8	+0.41
203	" "	16 12 0	.6750000	56 20 34.8	7 33.78	+ 4 47 13.2	+ 17.86	55 52.7	+0.40
204	1728, Aug. 26	14 28 35	.6031829	55 42 16.2	7 13.48	+ 5 14 22.2	+ 5.31	54 36.5	. .
205	1729, Dec. 3	15 0 0	.6250000	56 13 57.5	7 8.54	+ 4 47 52.6	− 12.28	54 2.2	. .
206	1733, Mar. 22	5 31 55	.2304977	92 58 9.1	8 4.78	− 2 30 39.3	− 37.49	57 53.8	. .
207	" Mar. 25	5 26 36	.2268056	131 59 57.7	7 35.40	− 4 44 16.9	− 14.56	55 51.8	. .
208	1736, Apr. 14	8 18 41	.3463079	66 28 27.9	7 51.42	− 4 34 4.5	− 21.26	56 47.8	. .
209	" Aug. 1	16 13 12	.6758334	65 46 55.5	7 53.76	− 4 45 5.3	− 16.21	57 3.5	. .
210	" "	17 25 14	.7258565	66 26 27.1	7 54.59	− 4 46 26.2	− 15.86	57 6.2	. .
211	" Oct. 22	12 43 39	.5303125	66 1 50.2	7 35.29	− 4 51 35.0	− 14.67	55 45.9	. .
212	" "	13 58 30	.5822917	66 41 17.0	7 35.62	− 4 52 50.2	− 14.18	55 47.4	. .
213	1737, May 7	7 40 55	.3195081	137 52 3.5	8 9.53	− 2 24 48.8	+ 38.38	58 10.9	. .
213*a*	" May 22	13 55 13.3	.5800151	349 23 3.9	7 7.82	− 0 23 23.4	− 37.77	54 22.0	. .
213*b*	" July 22	11 34 32.6	.4823217	64 4 54.3	7 23.70	− 5 8 48.5	− 4.01	55 7.1	. .
214	1738, Jan. 2	4 18 0	.1791667	63 21 18.7	7 13.91	− 5 6 30.9	+ 1.60	54 26.1	. .
215	" "	6 42 0	.2791667	64 33 38.9	7 14.41	− 5 6 11.0	+ 2.41	54 27.8	. .
216	" "	9 6 0	.3791667	65 46 4.4	7 14.99	− 5 5 42.7	+ 3.22	54 29.6	+0.16
217	" "	11 30 0	.4791667	66 58 35.5	7 15.56	− 5 5 6.1	+ 4.03	54 31.4	+0.17
218	" Feb. 2	6 8 35	.2559607	109 32 40.8	7 42.06	− 3 24 10.2	+ 32.26	56 15.0	. .
219	" Aug. 8	13 0 0	.5416667	63 13 7.1	7 7.57	− 5 9 18.1	+ 8.51	54 11.8	. .
220	" "	15 24 0	.6416667	64 24 21.8	7 7.61	− 5 7 48.6	+ 9.33	54 11.8	. .
221	" "	20 12 0	.8416667	66 46 51.8	7 7.61	− 5 4 25.7	+ 10.88	54 11.8	. .
222	" Oct. 2	9 56 23.7	.4141632	65 41 42.6	7 8.65	− 4 54 25.3	+ 10.80	54 13.1	. .
223	" "	10 56 44.3	.4560682	66 11 38.5	7 8.54	− 4 53 39.4	+ 11.09	54 12.9	. .
224	" Dec. 23	5 24 32	.2253703	65 27 45.8	7 7.61	− 4 43 45.5	+ 15.23	54 0.7	. .
225	" "	6 24 33	.2670485	65 57 27.1	7 7.57	− 4 42 41.3	+ 15.54	54 0.5	. .
225*a*	1739, Feb. 15	6 50 49	.2852893	59 16 41.5	7 12.32	− 5 1 7.4	+ 12.27	54 29.9	. .
226	" Aug. 4	2 36 0	.1083333	131 3 14.7	7 8.94	+ 0 48 39.2	+ 39.15	54 14.5	. .
227	" "	5 0 0	.2083333	132 14 46.5	7 9.30	+ 0 55 10.9	+ 39.15	54 15.8	. .
228	" Oct. 23	11 39 40.0	.4858796	112 41 42.4	7 4.58	− 0 24 38.0	+ 37.42	54 15.1	. .
229	" "	12 50 20.2	.5349560	113 16 26.1	7 4.48	− 0 21 34.2	+ 37.47	54 14.9	. .
230	" Oct. 24	11 9 43.0	.4650810	124 14 36.1	7 4.98	+ 0 36 32.6	+ 37.31	54 16.7	. .
231	" "	12 16 5.0	.5111690	124 47 15.2	7 5.05	+ 0 39 24.6	+ 37.30	54 17.1	. .
232	1746, Mar. 26	8 0 0	.3333333	57 3 15.9	7 12.14	+ 4 43 8.3	+ 17.62	54 27.3	. .
233	1747, Jan. 20	13 0 0	.5416667	57 22 22.3	7 8.15	+ 5 7 33.1	+ 5.74	54 13.2	. .
234	" July 30	12 0 0	.5000000	56 23 42.2	7 7.93	+ 5 14 50.4	− 0.02	54 13.3	. .

Observations by FLAMSTEED.

These observations are used as printed in Volume I of the *Historia Coelestis Britannica.* His clock seems to have been rather inferior to those of his French contemporaries, while its correction was less carefully and regularly determined. For this purpose he appears to have depended entirely on altitudes of sun or stars observed with a quadrant, and to have made no effort whatever to eliminate possible constant errors by observations on both sides of the meridian. To this we have to add the fact that typographical errors in the *Historia Coelestis* are so numerous that uncertainties frequently arise from them. It is therefore hardly possible to form a judgment of the probable errors of the clock-corrections.

It does not appear necessary to reprint the observations in full; but we present the clock-errors resulting from the individual altitudes in the following table:—

Individual Corrections to Flamsteed's Clock, as given by Altitudes.

Date.	Greenwich Mean Time.	Correction.	Date.	Greenwich Mean Time.	Correction.	Date.	Greenwich Mean Time.	Correction.
	h m s	m s		h m s	m s		h m s	m s
1676, Mar. 18	7 41 34	+ 12 4	1676, Aug. 30	20 12 26	+ 4 28	1682, Mar. 11	21 30 4	— 5 30
	44 11	12 1		13 36	4 26		33 0	5 30
	47 41	12 6		14 45	4 30		35 54	5 24
	49 54	12 4	Nov. 9	6 46 56	— 3 40	Mar. 14	11 0 37	— 5 42
Mar. 22	10 13 59	+ 4 12		51 19	3 42		2 23	5 42
	17 18	3 51		53 31	3 41		4 25	5 43
	20 43	3 56	1677, Mar. 9	7 50 41	— 0 22		6 32	5 44
	23 10	3 58		51 56	0 23	1683, Feb. 3	6 13 24	— 1 52
	11 17 19	3 47		53 13	0 25		15 34	1 54
Mar. 24	7 57 38	+ 4 18		55 47	0 25		17 44	1 51
	8 7 29	4 14	Mar. 11	7 20	— 0 7	Feb. 5	9 5 46	— 2 4
	8 17 12	4 27	1678, Oct. 28	7 12 43	— 5 51		7 54	2 4
June 26	5 9 23	+ 6 11		19 12	5 52		10 9	2 4
	28 49	6 16		22 27	5 49		12 27	2 3
	48 28	6 29		28 58	5 54		14 48	2 4
30	5 26 30	+ 8 47	Oct. 29	11 25 5	— 6 11	Apr. 1	20 17 15	— 5 50
	31 22	8 46		28 22	— 6 12		19 33	5 53
Aug. 19	3 36 9	+ 5 43	1680, Jan. 16*	7 22 0	+ 11 16		21 53	5 52
	38 27	5 44		27 15	11 23	6	20 40	— 5 51
	43 3	5 48		31 8	11 25	30	20 5	— 6 1
	20 25 8	+ 5 23		34 45	11 23	May 6	19 45	— 5 59
	28 33	5 19		38 9	+ 11 21	1686, Apr. 9	20 20	— 8 34
	30 51	5 15				20	20	— 12 52
	35 31	5 18						

* Clock losing about 32ˢ per day on mean time.

Clock-corrections for FLAMSTEED'S *Eclipses.*

	h	m s		h	m s		h	m s
1676, June 0,	29.1	—2 10	1684, July 8,	5	— 4 28	1689, Sept. 5,	1.8	+1 29
1,	5.6	—1 46	12,	5	— 3 40	' Sept. 12,	3.9	+1 49
			1687, May 6,	20.0	—12 25		20.0	+2 5
			1687, May 11,	4.5	—14 30			

Longitudes and Latitudes of Stars for 1850.

Adopted obliquity for 1850, 23° 27′ 31″.4.

Name of star.	Long., 1850.	L'	μ_1	Lat., 1850.	B'	B''	μ_2
	° ′ ″	″	″	° ′ ″	″	″	″
δ Piscium	12 3 4.56	5027.30	+ 3.75	+ 2 10 24.09	+ 7.77	+ 0.17	− 7.33
o Piscium	25 38 41.10	5030.82	+ 4.45	− 1 37 54.11	+ 17.45	+ 0.14	− 7.71
Lalande 4903	. . . . .	. . .	. .	. . . .	. .	. .	. .
ρ^3 Arietis	44 49 28.02	5044.77	+ 20.13	+ 1 10 34.52	+ 9.95	+ 0.08	− 26.88
B. A. C. 920	. . . .	. . .	. .	. . . .	. .	. .	. .
ε Arietis	46 24 19.42	5021.59	− 1.59	+ 4 9 31.65	+ 37.45	+ 0.08	− 0.18
δ Arietis	48 45 10.95	5037.80	+ 13.40	+ 1 48 35.34	+ 35.01	+ 0.07	− 3.75
ζ Arietis	49 51 1.50	5018.76	− 5.17	+ 2 52 40.69	+ 31.99	+ 0.07	− 7.27
f Tauri	51 29 47.81	5028.22	+ 0.40	− 5 55 55.76	+ 39.62	+ 0.06	− 0.37
9 Tauri	55 20 44.37	5020.92	− 2.89	+ 3 42 22.55	+ 35.94	+ 0.05	− 5.62
16 *g* Pleiadum (Celaeno)	57 20 27.90	5023.46	− 0.21	+ 4 20 58.47	+ 36.30	+ 0.04	− 6.01
17 *b* Pleiadum (Electra)	57 19 04.12	5023.52	− 0.21	+ 4 10 27.23	+ 36.29	+ 0.04	− 6.01
m Pleiadum	57 32 36.36	5023.29	− 0.20	+ 4 52 3.00	+ 36.37	+ 0.04	− 6.01
19 *e* Pleiadum (Taygeta)	57 28 14.20	5023.42	− 0.20	+ 4 30 9.03	+ 36.34	+ 0.04	− 6.01
20 *c* Pleiadum (Maia)	57 35 10.48	5023.47	− 0.20	+ 4 22 27.82	+ 36.38	+ 0.04	− 6.01
23 *d* Pleiadum (Merope)	57 36 18.62	5023.63	− 0.20	+ 3 56 24.61	+ 36.38	+ 0.04	− 6.02
η Tauri	57 53 53.58	5023.62	− 0.19	+ 4 2 6.94	+ 36.49	+ 0.04	− 6.02
27 *f* Pleiadum (Atlas)	58 15 42.32	5023.61	− 0.17	+ 3 54 6.42	+ 36.61	+ 0.04	− 6.03
h Pleiadum	58 17 6.70	5023.68	− 0.17	+ 3 58 55.08	+ 36.61	+ 0.04	− 6.03
33 Tauri	59 51 0.18	5030.00	+ 5.63	+ 2 39 45.27	+ 39.93	+ 0.03	− 3.25
A^1 Tauri	61 21 28.80	5032.66	+ 7.80	+ 1 14 40.94	+ 33.68	+ 0.03	− 9.98
53 Tauri	64 33 37.15	5027.41	+ 2.09	− 0 17 56.98	+ 38.81	+ 0.01	− 5.77
ω^2 Tauri	63 58 0.04	5019.68	− 5.77	− 0 46 3.73	+ 40.10	+ 0.02	− 4.32
51 Tauri	64 23 28.69	5033.59	+ 8.40	+ 0 10 23.27	+ 38.34	+ 0.02	− 6.20
γ Tauri	63 42 22.34	5038.67	+ 11.24	− 5 44 56.14	+ 39.53	+ 0.02	− 4.81
56 Tauri	64 42 26.60	5026.36	+ 1.20	+ 0 18 57.33	+ 38.50	+ 0.01	− 6.12
58 Tauri	63 48 36.36	5038.00	+ 11.02	− 6 18 24.08	+ 39.17	+ 0.02	− 5.21
χ Tauri	66 1 17.99	5027.84	+ 3.58	+ 4 0 13.10	+ 40.55	+ 0.01	− 4.39
κ^1 Tauri	66 6 22.07	5032.90	+ 7.81	+ 0 36 38.91	+ 37.66	+ 0.01	− 7.31
κ^2 Tauri	66 6 6.55	5035.98	+ 10.87	+ 0 30 59.01	+ 36.87	+ 0.01	− 8.09
70 Tauri	65 8 54.07	5034.35	+ 7.65	− 5 40 14.95	+ 40.80	+ 0.01	− 3.92
71 Tauri	65 16 9.35	5036.06	+ 9.28	− 6 1 2.85	+ 39.51	+ 0.01	− 5.24
B. A. C. 1373	66 36 19.67	5035 49	+ 10.21	− 0 9 4.89	+ 36.56	+ 0.01	− 8.52
ε Tauri	66 21 58.47	5035.64	+ 9.78	− 2 35 1.21	+ 38.74	+ 0.01	− 6.19
θ^1 Tauri	65 51 22.57	5035.39	+ 8.72	− 5 45 43.06	+ 40.43	+ 0.01	− 4.48
θ^2 Tauri	65 51 46.13	5036.73	+ 10.04	− 5 51 19.42	+ 40.75	+ 0.01	− 4.16
B. A. C. 1391	66 21 57.39	5033.81	+ 7.22	− 5 36 22.08	+ 39.93	+ 0.01	− 5.10
a Tauri	67 41 34.13	5029.58	+ 3.12	− 5 28 40.80	+ 25.40	0.00	− 19.88
τ Tauri	70 3 34.50	5024.60	− 0.51	+ 0 41 43.81	+ 42.72	0.00	− 3.10
o Tauri	80 24 6.36	5026.21	+ 0.91	− 1 18 39.46	+ 45.25	− 0.04	− 1.77
119 Tauri	81 18 3.38	5026.47	+ 1.09	− 4 42 19.15	+ 46.41	− 0.04	− 0.64
120 Tauri	81 36 38.28	5026.22	+ 0.86	− 4 46 26.76	+ 47.44	− 0.04	+ 0.37
136 Tauri	86 25 24.56	5026.52	+ 1.10	+ 4 9 44.95	+ 46.02	− 0.06	− 1.00
χ^2 Orionis	86 42 50.31	5024.11	− 0.95	− 3 42 13.34	+ 44.65	− 0.06	− 2.36
H Geminorum	88 51 7.95	5025.18	− 0.06	− 0 11 15.80	+ 36.66	− 0.07	− 10.21
3 Geminorum	90 8 36.04	5025.07	− 0.14	− 0 19 34.47	+ 45.04	− 0.07	− 1.71
Lalande 12148	. . . .	. . .	. .	. . . .	. .	. .	. .

Longitudes and Latitudes of Stars for 1850—Continued.

Name of star.	Long., 1850.	*L′*	μ_1	Lat., 1850.	*B′*	*B″*	μ_2
	° ′ ″	″	″	° ′ ″	″	′	″
μ Geminorum . . .	93 12 18.48	5032.00	+ 6.88	− 0 50 5.32	+ 34.42	− 0.08	− 11.97
η Geminorum . . .	91 20 40.91	5019.48	− 5.66	− 0 54 24.95	+ 44.98	− 0.07	− 1.65
ν Geminorum . . .	94 42 30.93	5023.30	− 1.44	− 3 4 29.55	+ 43.96	− 0.09	− 2.20
Weisse II, 1656 . .	. . . .	. . .	. .	. . . .	. .	. .	. .
λ Geminorum . . .	106 41 13.63	5019.62	− 3.74	− 5 39 4.60	+ 37.54	− 0.09	− 5.69
f Geminorum . . .	111 34 53.38	5022.17	− 1.61	− 3 45 40.41	+ 41.94	− 0.14	+ 0.45
g Geminorum . . .	112 59 52.92	5017.39	− 6.77	− 2 39 43.70	+ 33.82	− 0.14	− 7.10
85 Geminorum . . .	114 57 20.30	5022.61	− 2.24	− 0 53 44.84	+ 36.24	− 0.14	− 3.87
λ Cancri	119 43 15.34	5026.29	− 1.08	+ 4 21 55.07	+ 33.19	− 0.16	− 4.72
δ Cancri	126 37 33.12	5029.15	+ 3.87	+ 0 4 20.97	+ 11.19	− 0.17	− 23.09
α Cancri	131 32 49.20	5026.07	+ 3.82	− 5 5 32.66	+ 28.29	− 0.18	− 3.12
κ Cancri	134 4 34.96	5020.48	− 1.20	− 5 34 54.38	+ 29.06	− 0.18	− 0.77
ξ Leonis	139 33 22.76	5015.35	− 7.73	− 3 9 42.60	+ 15.07	− 0.19	− 11.11
ο Leonis	142 9 32.41	5009.35	− 13.24	− 3 45 49.64	+ 16.07	− 0.19	− 8.31
η Leonis	145 48 34.08	5027.87	− 0.92	+ 4 51 25.06	+ 21.42	− 0.19	− 0.35
α Leonis	147 44 39.90	5001.63	− 23.95	+ 0 27 35.91	+ 11.37	− 0.20	− 8.98
B. A. C. 3579 . . .	151 31 38.50	5021.65	− 7.00	+ 4 27 58.41	+ 12.73	− 0.20	− 4.79
τ Leonis	169 25 0.41	5025.93	+ 1.24	− 0 33 20.10	+ 1.45	− 0.20	− 1.78
e^1 Leonis	172 16 59.92	5022.17	+ 1.63	− 5 42 12.52	+ 0.33	− 0.20	− 0.57
γ Virginis	188 4 4.71	4974.25	− 53.22	+ 2 48 15.20	− 35.46	− 0.17	− 23.50
α Virginis	201 44 55.24	5020.21	− 3.55	− 2 2 35.62	− 27.94	− 0.15	− 5.54
λ Virginis	214 51 31.61	5022.20	− 3.35	+ 0 30 10.41	− 30.89	− 0.11	+ 0.30
α^1 Libræ	222 56 3.05	5015.02	− 10.42	+ 0 22 51.99	− 47.68	− 0.09	− 11.83
α^2 Libræ	222 59 29.42	5016.06	− 9.37	+ 0 21 7.60	− 47.08	− 0.09	− 11.22
γ Libræ	233 2 25.27	5033.81	+ 6.74	+ 4 24 7.06	− 39.21	− 0.06	+ 1.42
π Scorpii	240 50 46.83	5022.08	− 1.44	− 5 27 21.05	− 48.53	− 0.03	− 5.04
β^1 Scorpii	241 5 43.84	5025.33	− 0.23	+ 1 1 36.85	− 47.50	− 0.03	− 3.93
B. A. C. 5395 . . .	243 17 19.10	5013.38	− 11.81	− 0 11 6.60	− 43.51	− 0.02	+ 0.70
τ Scorpii	249 21 47.33	5024.37	+ 0.55	− 6 6 1.12	− 49.99	0.00	− 4.30
δ Sagittarii	. . . .	. . .	. .	. . . .	. .	. .	. .
ξ^2 Sagittarii	281 21 19.59	5027.25	+ 2.44	+ 1 40 49.86	− 47.20	+ 0.11	− 2.41
ο Sagittarii	282 53 48.46	5030.00	+ 5.00	+ 0 52 52.20	− 51.68	+ 0.11	− 7.30
π Sagittarii	284 9 28.01	5022.53	− 2.28	+ 1 27 24.42	− 47.84	+ 0.11	− 3.83
ρ^1 Sagittarii	237 21 25.77	5020.22	− 3.60	+ 4 14 26.80	− 42.93	+ 0.12	+ 0.08
ρ^2 Sagittarii	287 19 46.63	5032.85	+ 8.87	+ 3 47 1.60	− 54.20	+ 0.12	− 11.17
33 Capricorni	314 46 35.20	5022.12	− 6.54	− 5 18 38.24	− 41.79	+ 0.18	− 12.41
γ Capricorni	319 41 18.20	5043.47	+ 16.61	− 2 32 35.89	− 30.24	+ 0.19	− 4.11
e^2 Aquarii	328 23 27.70	5030.25	+ 4.81	− 0 16 28.65	− 21.39	+ 0.20	− 1.49
ο Aquarii	333 17 36.95	5023.39	− 2.79	− 1 13 13.67	− 18.11	+ 0.20	− 1.94
κ Aquarii	337 19 40.03	5010.35	− 11.63	+ 4 7 8.56	− 21.64	+ 0.20	− 8.62
τ^2 Aquarii	336 30 1.80	5026.35	− 3.35	− 5 39 28.56	− 17.55	+ 0.20	− 3.88
B. A. C. 8184 . . .	349 7 9.75	5035.12	+ 8.95	− 1 7 49.10	− 32.16	+ 0.20	− 28.66

NOTE.—These positions of the occulted stars are derived from an unpublished discussion, in which the several standard catalogues are reduced to the equinox of my paper *On the Right Ascensions of the Equatorial Fundamental Stars* (1872), and in which the positions of most of the stars observed by BRADLEY are from Dr. AUWERS's re-reduction of BRADLEY's observations.

Details of Reduction of the Occultations.

These are presented in the following tables in such form as to give as great facility as appeared practicable to any one desiring to re-examine and correct the work. Each observed occultation is numbered, so as to facilitate subsequent reference; the arrangement is not, however, chronological, except through each series. The different series are arranged in the order of their computation, as it did not seem necessary to run a risk of confusion in seeking to make them more nearly chronological. The only serious displacement occurs in the case of FLAMSTEED's observations, which, in strictness, should immediately follow those of HEVELIUS. The following are the only parts of the table which seem to need explanation.

The data for local and Greenwich mean times have been already pretty fully given, and, in most cases, the results are given in preceding sections, and are here simply copied from them. Small discrepancies may be found in some cases, as the definitive discussion was not completed till after a great deal of the computation of the following tables was made. Any corrections thus required can be readily made in the equations.

The sidereal times are in all cases from the mean equinox of the date, nutation being omitted.

The column "Moon's Tabular Geocentric Position" gives the longitude and latitude of the moon as derived from HANSEN's tables, and printed on pages 197 to 201. The longitude is counted from the mean equinox of the date, as in the case of the sidereal time.

The apparent tabular position of the moon's centre as seen from the place of observation is then deduced from the geocentric position by the method described in § 6. The upper line of each pair gives the longitude and latitude of the moon; the lower one, those of the star. The latter have been derived from the positions of the stars just given by reducing them to the date, and correcting for aberration.

Next we find the tabular differences of apparent longitude and latitude of the moon and star, formed by subtraction from the two preceding columns.

In the next column we have, in the upper line of each pair, the apparent semidiameter of the moon as seen from the place of observation, using OUDEMANS's value of the ratio of the diameter of the moon to that of the earth. The lower line gives the tabular distance of the centre of the moon from the star, deduced from the numbers of the preceding column. If the observations and all the elements of reduction were correct, these two numbers should be identical. The expression of the difference in terms of the elements which the observations will enable us to correct is the work of the following section.

The last column gives, in the upper line of each pair, the longitude of the sun at the time of the observation, and, in the lower line, the elongation of the star east of the sun. The latter number affords the argument for taking out the aberration of the star from the proper table, and for determining whether the phenomenon was observed at the bright or the dark limb of the moon.

Tabular Exhibit of Reduction of the Occultations.

No.	Star occulted. [Place of obs.]	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star.		l′−L b′−B	S′ D	⊙ L−⊙
						Longitudes.	Latitudes.			
	OCCULTATIONS OBSERVED BY BULLIALDUS.									
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	″	°
1	α Leonis . . .	1627,	9 29 42	9 29 22	144 30 40.5	144 7 15.6	+0 34 25.8	. .	938.4	86.3
	[Loudon.]	June 17	15 12 50	. . .	+1 23 59.4	144 39 4.1	+0 27 9.8	. .	. .	58.4
2	η Tauri, I. . .	1634,	5 44 4	5 43 44	54 24 14.8	54 44 56.6	+4 12 15.0	− 555.9	960.6	279.2
	[Loudon.]	Dec. 30	0 20 33	. . .	+4 46 35.2	54 54 12.5	+4 0 49.7	+ 685.3	881.5	135.7
3	τ Tauri, I. . .	1639,	9 9 42	9 0 21	67 33 17.7	66 50 19.4	+0 36 9.7	− 998.3	922.5	17.8
	[Paris.]	Apr. 7	10 13 13	. . .	+1 7 55.4	67 6 57.7	+0 40 13.4	− 243.7	1028.6	49.3
4	ε Tauri, I. . .	1641,	8 13 4	8 3 43	. . .	63 13 57.0	−2 28 30.9	− 764.7	888.2	24.1
	[Paris.]	Apr. 13	9 42 7	. . .	. . .	63 26 41.7	−2 36 23.0	+ 472.1	898.0	39.3
	GASSENDUS.									
5	α Leonis, I. . .	1627,	10 30 0	10 5 3	144 50 9.0	144 24 50.8	+0 34 51.0	− 853.3	935.4	86.3
	[Digne.]	June 17	16 13 16	. . .	+1 25 40.8	144 39 4.1	+0 27 9.7	+ 461.3	970.0	58.4
6	ξ Sagittarii, I. .	1627,	10 54 17	10 29 20	278 37 23.8	277 59 43.8	+1 46 48.4	− 931.1	903.0	175.6
	[Digne.]	Sept. 18	22 44 17	. . .	+2 26 51.8	278 15 14.9	1 42 31.9	+ 256.5	965.4	102.7
7	Mars, I. . . .	1632,	15 18 39	15 9 18	136 30 12.4	136 14 12.2	+4 20 32.8	− 569.0	945.1	316.6
	[Paris.]	Feb. 5	12 21 29	. . .	+4 58 18.5	136 23 41.2	+4 33 30.6	− 777.8	962.6	179.8
8	Mars, E. . . .	1632,	15 47 15	15 37 54	136 46 3.2	136 27 35.8	+4 18 16.0	+ 250.5	944.3	. .
		Feb. 5	12 50 9	. . .	+4 58 9.5	136 23 25.3	+4 33 30.6	− 914.6	948.0	. .
9	γ Capricorni, I. .	1635,	*9 47 49	9 22 52	316 30 0.9	316 26 44.7	−2 19 36.7	− 887.6	982.3	153.3
	[Digne.]	Aug. 26	20 7 14	. . .	−1 26 9.6	316 41 32.3	−2 31 30.2	+ 713.5	1138.3	163.
10	Pl. Electra, (b) I.	1637,	8 48 58	8 27 11	54 54 41.1	54 3 10.4	+4 13 45.8	−1056.3	979.6	9.4
	[Aix.]	Mar. 29	9 18 49	. . .	+4 38 53.2	54 20 46.7	+4 9 11.2	+ 274.6	1088.6	45.
11	Pl. Maia, (c) I. .	1637,	9 22 47	9 1 0	55 14 58.4	54 23 15.0	+4 10 34.3	− 818.2	978.0	. .
		Mar. 29	9 52 43	. . .	+4 38 11.0	54 36 53.2	+4 21 11.6	− 637.3	1035.4	. .
12	Pl. Merope, (d) I.	1637,	9 32 21	9 10 34	55 20 43.7	54 29 6.2	+4 9 37.1	− 534.9	977.6	. .
		Mar. 29	10 2 30	. . .	+4 37 59.0	54 38 1.1	+3 55 8.4	+ 868.7	1019.4	. .
13	η Tauri, I. . .	1637,	9 48 54	9 27 7	55 30 38.3	54 39 20.2	+4 7 58.6	− 976.0	976.8	9.4
		Mar. 29	10 18 55	. . .	+4 37 38.3	54 55 36.2	+4 0 50.5	+ 428.1	1063.6	45.5
14	Pl. Merope, I. .	1638,	7 39 34	7 17 47	54 34 5.4	54 23 5.6	+3 49 12.9	− 958.3	973.3	304.9
	[Aix.]	Jan. 24	3 55 58	. . .	+4 7 54.8	54 39 3.9	+3 55 9.1	− 356.2	1020.3	109.7
15	η Tauri, I. . . [Aix.]	1638,	8 35 10	8 13 23	55 06 05.6	54 45 30.0	+3 48 54.3	− 668.9	972.6	304.9
		Jan. 24	4 51 42	. . .	+4 6 4.9	54 56 38.9	+4 0 51.2	− 716.9	979.4	110.0
16	μ Geminorum, I.	1638,	16 36 34	16 11 37	90 40 36.3	90 00 48.0	−0 47 19.5	− 897.2	979.2	269.0
	[Digne.]	Dec. 20	10 35 29	. . .	−0 15 22.0	90 15 45.2	−0 51 18.4	+ 238.9	928.4	181.7

* This local time should be increased by $2^m\ 23^s$. See page 82.

Tabular Exhibit of Reduction of the Occultations—Continued.

HEVELIUS AT DANTZIG.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star.		$l'-L$ $b'-B$	S' D	⊙ $L-$⊙
						Longitudes.	Latitudes.			
			h m s	*h m s*	° ′ ″	° ′ ″	° ′ ″	″	″	°
17	*α* Tauri, I. . .	1644,	14 50 9	13 35 33	64 59 57.9	64 33 28.8	−5 36 14.6	− 993.2	1009.0	233.0
		Nov. 14	6 28 51	. . .	−5 0 50.5	64 50 2.0	−5 29 32.7	− 401.9	1066.3	191.8
18	*α* Tauri, E. . .	1644,	15 50 39	14 36 3	65 38 3.4	65 4 39.0	−5 36 32.5	+ 877.0	1007.4	. .
		Nov. 14	7 29 31	. . .	−5 0 43.5	64 50 2.0	−5 29 32.7	− 419.8	967.8	. .
19	*α* Tauri, I. . .	1645,	13 33 6	12 18 30	64 27 23.1	64 33 49.9	−5 31 39.5	−1010.5	995.5	195.8
		Oct. 8	2 44 46	. . .	−4 51 50.4	64 50 40.4	−5 29 31.3	− 128.2	1013.7	229.0
20	*α* Tauri, E. . .	1645,	14 43 0	13 28 44	65 9 57.4	65 6 45.1	−5 27 53.0	+ 964.7	996.2	. .
		Oct. 8	3 54 51	. . .	−4 50 37.9	64 50 40.4	−5 29 31.3	− 98.3	965.2	. .
21	B. A. C. 920 . .	1656,	8 34 45	7 20 9	44 7 19.2	43 25 48.1	+4 26 39.9	. .	931.4	341.6
		Mar. 1	7 15 36	. . .	+4 54 8.4	. . .	. . .	. .	. .	62
22	53 Tauri, I. . .	1658,	11 6 55	9 52 19	61 25 40.1	61 42 17.8	−0 30 3.0	− 686.0	893.0	202.5
		Oct. 14	0 41 15	. . .	+0 8 6.0	61 53 43.8	−0 19 11.0	− 652.0	946.4	219.4
23	*β* Scorpii, E. . .	1660,	14 38 37	13 24 1	238 38 45.5	238 40 11.4	+1 11 54.5	+ 776.9	964.3	37.0
		Apr. 26	17 1 22	. . .	+2 8 20.5	238 27 14.5	+1 3 6.7	+ 527.8	939.2	201.4
24	*α* Virginis, I. .	1660,	10 56 25	9 41 49	199 0 38.4	198 54 19.0	−2 11 23.9	− 732.7	927.7	87.0
		June 17	16 43 35	. . .	−1 16 33.4	199 6 31.7	−2 1 43.8	− 580.1	934.4	112.1
25	71 Tauri, I. . .	1663,	9 39 25	8 24 49	63 8 12.9	62 26 29.5	−5 51 7.6	− 768.8	980.4	354.0
		Mar. 14	9 8 57	. . .	−5 14 0.6	62 39 18.3	−6 2 20.5	+ 672.9	1018.5	67.1
26	θ^2 Tauri, I. . .	1663,	10 32 7	9 17 31	63 39 46.6	62 56 45.4	−5 53 19.2	−1088.7	978.3	. .
		Mar. 14	10 1 48	. . .	−5 14 21.2	63 14 54.1	−5 52 37.4	− 41.8	1083.8	. .
27	θ^1 Tauri, I. . .	1663,	10 35 7	9 20 31	63 41 34.8	62 58 32.1	−5 53 27.6	− 960.9	978.2	. .
		Mar. 14	10 4 48	. . .	−5 14 22.4	63 14 33.0	−5 47 0.5	− 387.1	1031.3	. .
28	e^2 Aquarii, I. .	1663,	9 15 37	8 1 1	325 32 21.2	325 36 9.8	−0 26 21.9	− 687.3	924.2	145.6
		Aug. 18	19 4 4	. . .	+0 25 5.0	325 47 37.1	−0 15 47.5	− 634.4	935.2	180.2
29	e^2 Aquarii, E. .	1663,	10 5 31	8 50 55	325 59 0.5	325 57 8.2	−0 27 59.6	+ 571.1	925.6	. .
		Aug. 18	19 54 6	. . .	+0 25 25.9	325 47 37.1	−0 15 47.5	− 732.1	928.8	. .
30	*α* Tauri, I. . .	1664,	9 24 20	8 9 44	65 31 39.9	64 49 36.8	−5 34 27.5	− 966.4	969.8	11.6
		Mar. 31	10 3 51	. . .	−4 55 42.3	65 5 43.2	−5 29 29.7	− 297.8	1007.2	53.5
31	*α* Tauri, E. . .	1664,	10 16 6	9 1 30	66 2 8.9	65 20 18.0	−5 35 55.2	+ 874.8	967.8	. .
		Mar. 31	10 55 45	. . .	−4 54 58.5	65 5 43.2	−5 29 29.7	− 385.5	952.3	. .
32	Not identified .	1671,	9 3 34	7 48 58	46 30 41.8	45 43 50.9	+3 2 55.8	. .	989.0	354.0
		Mar. 14	8 33 15	. . .	+3 35 38.8	. . .	. . .	. .	. .	52.3
33	Not identified .	1671,	9 6 37	7 52 1	46 32 33.2	45 45 38.2	+3 2 57.3	. .	988.9	. .
		Mar. 14	8 36 19	. . .	+3 35 46.3	. . .	. . .	. .	. .	. .
34	Not identified .	1671,	9 55 25	8 40 49	47 2 12.4	46 15 0.5	+3 2 29.4	. .	986.5	. .
		Mar. 14	9 25 15	. . .	+3 37 46.4	. . .	. . .	. .	. .	. .

Tabular Exhibit of Reduction of the Occultations—Continued.

HEVELIUS AT DANTZIG—Continued.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star. Longitudes.	Apparent Position of Moon and Star. Latitudes.	$l'-L$ $b'-B$	S' D	⊙ $L-$⊙
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	″	°
35	*a* Virginis, I. .	1671,	10 47 1	9 32 25	198 40 21.9	199 0 50.5	−2 5 5.2	− 897.6	889.4	32.4
		Apr. 22	12 50 45	. . .	−1 21 22.1	199 15 48.1	−2 1 46.4	− 198.8	918.7	166.9
36	*a* Virginis, E. .	1671,	11 56 30	10 41 54	199 14 31.7	199 26 19.6	−2 11 39.2	+ 631.5	889.1	. .
		Apr. 22	14 0 26	. . .	−1 24 22.7	199 15 48.1	−2 1 46.4	− 592.8	865.8	. .
37	Pl. Cel., 16 *g*, I.	1672,	12 36 33	11 21 57	54 47 19.4	54 37 6.5	+4 28 33.6	− 925.7	1004.8	223.9
		Nov. 5	3 40 15	. . .	+4 57 57.4	54 52 32.2	+4 19 54.1	+ 519.5	1059.5	191.5
38	Pl. Tay., 19 *e*, I.	1672,	12 48 18	11 33 42	54 54 37.2	54 42 42.0	+4 29 2.0	−1056.6	1004.7	. .
		Nov. 5	3 52 2	. . .	+4 58 3.0	55 0 18.6	+4 29 4.6	− 2.6	1053.4	. .
39	Pl. Maia, 20 *c*, I.	1672,	13 7 4	11 52 28	55 6 16.2	54 51 39.7	+4 29 45.2	− 935.1	1004.6	. .
		Nov. 5	4 10 51	. . .	+4 58 11.9	55 7 14.8	+4 21 23.3	+ 501.9	1058.8	. .
40	Pl. Tay., 19 *e*, I.	1673,	8 5 16	6 51 10	55 30 31.7	54 49 24.9	+4 41 21.0	− 640.8	963.3	2.5
		Mar. 22	8 8 51	. . .	+5 10 52.8	55 0 5.7	+4 29 6.0	+ 735.0	974.5	52.5
41	Pl. Tay., 18 *m*, I.	1673,	8 8 46	6 54 10	55 32 15.8	54 50 58.8	+4 41 13.4	− 808.5	963.2	. .
		Mar. 22	8 11 53	. . .	+5 10 53.0	55 4 27.3	+4 51 0.2	− 586.8	996.5	. .
42	Pl. Ast., 21 *k*, I.	1673,	8 19 46	7 5 10	55 38 36.3	54 56 44.8	+4 40 45.0	− 831.2	962.8	. .
		Mar. 22	8 22 54	. . .	+5 10 53.4	55 10 36.0	+4 32 5.1	+ 519.9	978.2	. .
43	Pl. Ast., 22 *l*, I.	1673,	8 24 46	7 10 10	55 41 29.1	54 59 22.7	+4 40 31.1	− 764.5	962.7	. .
		Mar. 22	8 27 55	. . .	+5 10 53.6	55 12 7.2	+4 30 6.0	+ 625.1	985.8	. .
44	Pl. Elec., 17 *b*, I.	1674,	13 41 29	12 26 53	54 20 22.6	54 37 12.8	+4 3 26.0	− 907.3	923.4	150.6
		Aug. 23	23 51 42	. . .	+4 42 56.3	54 52 20.1	+4 9 24.4	− 358.4	973.4	264.3
45	Pl. Cel., 16 *g*, I.	1674,	14 8 59	12 54 23	54 34 48.2	54 49 36.5	+4 4 38.5	− 247.4	924.4	. .
		Aug. 23	0 19 16	. . .	+4 42 23.0	54 53 43.9	+4 19 55.9	− 917.4	949.5	. .
46	Pl. Mer., 23 *d*, I.	1674,	14 25 59	13 11 23	54 43 43.0	54 56 56.3	+4 5 22.6	− 758.3	925.0	. .
		Aug. 23	0 36 19	. . .	+4 42 2.5	55 9 34.6	+3 55 22.1	+ 600.5	965.8	. .
47	Pl. Cel., 16 *g*, E.	1674,	14 32 29	13 17 53	54 47 9.2	54 59 56.7	+4 5 42.6	+ 372.8	925.1	. .
		Aug. 23	0 42 50	. . .	+4 41 58.2	54 53 43.9	+4 19 55.9	− 853.3	929.0	. .
48	Pl. Maia, 20 *e*, I.	1674,	14 43 59	13 29 23	54 53 10.9	55 4 53.7	+4 6 10.9	− 212.8	925.5	. .
		Aug. 23	0 54 22	. . .	+4 41 44.0	55 8 26.5	+4 21 25.3	− 914.4	938.4	. .
49	Pl. Elec., 17 *b*, E.	1674,	14 51 29	13 36 53	54 57 7.2	55 8 6.3	+4 6 29.2	+ 946.2	925.7	. .
		Aug. 23	1 1 53	. . .	+4 41 34.7	54 52 20.1	+4 9 24.4	175.2	959.8	. .
50	Pl. Alcy., 25 *η*, T.	1674,	15 1 29	13 46 53	55 2 22.6	55 12 21.3	+4 6 52.9	888.3	926.0	. .
		Aug. 23	1 11 55	. . .	+4 41 22.1	55 27 9.6	+4 1 4.4	+ 348.5	952.2	. .
51	Pl. Maia, 20 *c*, E.	1674,	15 4 29	13 49 53	55 3 56.5	55 13 36.5	+4 7 0.3	+ 310.1	926.1	150.6
		Aug. 23	1 14 56	. . .	+4 41 18.6	55 8 26.4	+4 21 25.3	− 865.0	918.4	264.5
52	Pl. Mer., 23 *d*, E.	1674,	15 16 49	14 2 13	55 10 25.3	55 18 47.0	+4 7 28.2	+ 552.5	926.4	. .
		Aug. 23	1 27 18	. . .	+4 41 3.3	55 9 34.5	+3 55 22.1	+ 726.1	911.6	. .

Tabular Exhibit of Reduction of the Occultations—Continued.

HEVELIUS AT DANTZIG—Continued.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star. Longitudes.	Apparent Position of Moon and Star. Latitudes.	$l'-L$ $b'-B$	S' D	☉ $L-$☉
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	″	°
53	Pl. Alcy., 25 η, E.	1674,	16 8 24	14 53 48	55 37 31.0	55 39 53.0	+4 9 12.2	+ 763.6	927.6	. .
		Aug. 23	2 19 1	. . .	+4 39 59.3	55 27 9.4	+4 1 4.4	+ 487.8	904.5	. .
54	. . . . . .	1675,	8 8 32	6 53 56	111 30 48.8	112 6 31.2	−0 39 22.1	. .	974.0	291.4
		Jan. 11	3 33 45	. . .	−0 6 15.5	. . .	. . .	. .	. .	179.9
55	85 Geminorum, I.	1675,	8 43 2	7 28 26	111 51 1.7	112 23 49.0	−0 40 11.8	− 447.4	974.5	. .
		Jan. 11	4 8 21	. . .	−0 8 7.7	112 31 16.4	−0 54 48.7	+ 876.9	984.5	. .
56	Anonymous . .	1675,	8 59 7	7 44 31	112 0 27.5	112 31 41.5	−0 40 40.5	. .	975.9	. .
		Jan. 11	4 24 29	. . .	−0 9 0.0	. . .	. . .	. .	. .	. .
57	85 Geminorum, E.	1675,	9 16 52	8 2 16	112 10 51.8	112 40 15.4	−0 41 16.5	+ 539.0	976.5	. .
		Jan. 11	4 42 16	. . .	−0 9 57.7	112 31 16.4	−0 54 48.7	+ 812.2	974.7	. .
58	Mars, I. . . .	1676,	13 34 33	12 19 57	77 26 45.4	77 53 31.0	−0 30 11.0	− 932.6	895.3	159.3
		Aug. 31	0 18 20	. . .	+0 9 19.3	78 9 3.6	−0 28 0.4	− 130.6	941.6	278.1
59	Mars, E. . . .	1676,	14 45 48	13 31 12	78 1 52.8	78 24 51.7	−0 29 33.9	+ 873.6	897.6	. .
		Aug. 31	1 29 46	. . .	+0 6 12.7	78 10 18.1	−0 27 57.1	− 96.8	878.8	. .
60	B. A. C. 1714? .	1676,	14 52 54	13 38 18	78 5 22.7	78 27 50.3	−0 29 31.2	. .	897.8	. .
		Aug. 31	1 36 54	. . .	+0 5 54.1	. . .	. . .	. .	. .	. .
61	. . . . . .	1678,	7 37 52	6 23 16	83 41 30.8	83 19 58.9	−3 40 14.2	. .	914.7	8.3
		Mar. 28	8 3 43	. . .	−3 7 41.1	. . .	. . .	. .	. .	75.4
62	χ Orionis, I. . .	1678,	9 22 52	8 8 16	84 35 17.1	84 4 44.3	−3 47 33.1	− 854.8	911.9	. .
		Mar. 28	9 49 0	. . .	−3 11 31.1	84 18 59.1	−3 43 31.5	− 241.6	886.5	. .
63	α¹ Libræ, I . .	1679,	14 50 30	13 35 54	220 9 52.1	220 19 26.0	+0 18 42.2	− 854.4	901.1	8.9
		Mar. 29	15 20 31	. . .	+1 9 1.5	220 33 40.4	+0 24 12.5	− 330.3	916.4	211.6
64	α² Libræ, I. . .	1679,	14 58 10	13 43 34	220 13 44.3	220 22 18.5	+0 18 46.7	− 886.3	901.1	. .
		Mar. 29	15 28 13	. . .	+1 9 22.4	220 37 4.8	+0 22 27.6	− 220.9	913.2	. .
65	α¹ Libræ, E. . .	1679,	16 6 10	14 51 34	220 48 4.9	220 48 9.5	+0 19 59.5	+ 869.1	900.5	. .
		Mar. 29	16 36 23	. . .	+1 12 28.0	220 33 40.4	+0 24 12.5	− 253.0	905.3	. .
66	α² Libræ, E. . .	1679,	16 14 45	15 0 9	220 52 25.8	220 51 29.2	+0 20 11.4	+ 864.4	900.6	. .
		Mar. 29	16 44 59	. . .	+1 12 51.3	220 37 4.8	+0 22 27.6	− 136.2	875.0	. .
67	Jupiter, I. . .	1679,	16 16 6	15 1 30	30 4 4.0	30 19 1.4	−1 11 57.0	. .	979.9	73.9
		June 4	21 10 30	. . .	−0 17 59.6	. . .	. . .	. .	. .	316.2
68	Jupiter, E. . .	1679,	17 14 17	15 49 41	30 38 43.3	. . .	. . .	. .	981.8	. .
		June 4	22 8 51	. . .	−0 21 6.6	. . .	. . .	. .	. .	. .
69	ρ Sagittarii, I. .	1679,	11 6 18	9 51 42	284 41 24.5	284 50 22.3	+4 1 59.7	− 526.2	955.1	93.0
		June 24	17 18 42	. . .	+4 57 36.9	284 59 8.5	+4 15 40.2	− 820.5	974.5	191.7
70	ρ Sagittarii, E. .	1679,	11 47 5	10 32 29	285 4 50.0	285 8 8.5	+4 2 16.9	+ 540.0	955.9	. .
		June 24	17 59 36	. . .	+4 57 58.9	284 59 8.5	+4 15 40.2	− 803.3	967.2	. .

Tabular Exhibit of Reduction of the Occultations—Continued.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star.		$l'-L$ $b'-B$	S' D	$\odot$ $L-\odot$
HEVELIUS AT DANTZIG—Continued.										
						Longitudes.	Latitudes.			
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	′	°
71	α Tauri, I. . .	1681,	7 42 17	6 27 41	64 53 53.2	65 2 47.2	−5 26 08.8	−1046.9	1005.4	282.2
		Jan. 1	2 30 9	. . .	−4 45 23.2	65 20 14.1	−5 29 22.7	+ 193.9	1060.0	142.7
72	α Tauri, E. . .	1681,	8 51 17	7 36 41	65 36 51.3	65 36 23.4	−5 24 41.4	+ 969.3	1006.5	. .
		Jan. 1	3 39 20	. . .	−4 46 35.7	65 20 14.1	−5 29 22.7	+ 281.3	1005.0	. .
73	α Tauri, I. . .	1683,	9 56 8	8 41 32	65 19 27.0	65 4 42.4	−5 28 57.0	−1031.8	968.3	289.9
		Jan. 9	5 14 1	. . .	−4 54 29.8	65 21 54.2	−5 29 22.0	+ 25.0	1025.7	135.4
74	α Tauri, E. . .	1683,	11 9 23	9 54 47	66 1 42.3	65 37 17.1	−5 27 0.8	+ 922.9	967.9	. .
		Jan. 9	6 27 28	. . .	−4 53 6.6	65 21 54.2	−5 29 22.0	+ 141.2	928.6	. .
75	119 Tauri, I. . .	1683,	9 58 20	8 43 44	79 16 42.7	78 40 7.4	−4 43 30.0	−1089.6	939.7	13.3
		Apr. 2	10 43 27	. . .	−4 3 47.7	78 58 17.0	−4 43 35.5	+ 5.5	1086.2	66.0
76	120 Tauri, I. . .	1683,	10 34 56	9 20 20	79 36 49.1	78 59 55.9	−4 44 6.8	−1016.2	938.6	13.3
		Apr. 2	11 20 9	. . .	−4 2 42.9	79 16 52.1	−4 47 46.1	+ 219.3	1036.7	66.3
77	119 Tauri, E. . .	1683,	10 58 10	9 43 34	79 49 35.0	79 12 56.0	−4 44 30.8	+ 879.0	937.8	. .
		Apr. 2	11 43 27	. . .	−4 2 1.7	78 58 17.0	−4 43 35.5	− 55.3	878.2	66.5
THE CASSINIS AND OTHERS AT THE PARIS OBSERVATORY.										
78	τ Scorpii, I. . .	1672,	10 27 42.6	10 18 21.6	246 54 51.4	246 38 9.8	−6 4 47.5	− 915.5	887.3	130.9
		Aug. 2	19 16 41.9	. . .	−5 13 26.2	246 53 25.3	−6 4 35.0	− 12.5	910.7	116.0
79	85 Geminorum .	1675,	8 18 18	8 8 57	112 14 47.4	112 53 11.7	−0 38 25.4	. .	974.8	291.4
		Jan. 11	. . . .	. . .	−0 10 19.5	112 31 16.4	−0 54 48.7	. .	. .	180
80	e Leonis, I. . .	1676,	10 32 18	10 22 57	169 3 17.2	169 39 32.0	−5 30 38.7	− 741.4	981.0	340.8
		Feb. 29	9 10 19.4	. . .	−4 56 59.7	169 51 53.4	−5 42 13.4	+ 694.7	1013.3	189.1
81	e Leonis, E. . .	1676,	11 29 24	11 20 3	169 37 32.6	170 5 52.1	−5 34 46.8	+ 838.7	983.0	. .
		Feb. 29	10 7 34.8	. . .	−4 57 31.9	169 51 53.4	−5 42 12.7	+ 445.9	946.4	. .
82	Saturn, I. . .	1678,	7 30 21	. . .	63 40 50.7	63 17 51.9	−1 43 27.7	. .	925.9	. .
		Feb. 27	6 2 1.3	. . .	−1 18 24.2	. . . .	. . . .	. .	. .	. .
83	Saturn, E. . .	1678,	8 42 21	. . .	64 18 21.3	63 46 19.3	−1 47 15.8	. .	923.5	. .
		Feb. 27	7 14 13.1	. . .	−1 21 36.7	. . . .	. . . .	. .	. .	. .
84	Lalande 12148 .	1680,	10 27 43	10 18 22	91 23 11.3	90 45 12.0	−5 55 17.6	. .	963.4	16.0
		Apr. 4	11 23 50.4	. . .	−5 15 13.5	. . . .	. . . .	. .	. .	75.4
85	γ Tauri, I. . .	1683,	12 13 50.6	12 4 29.6	61 55 11.7	61 10 41.2	−5 35 1.2	− 700.8	943.0	317.4
		Feb. 5	9 18 43.5	. . .	−5 3 26.7	61 22 22.0	−5 46 4.1	+ 662.9	962.5	104.0
86	μ Geminorum, I.	1684,	9 34 17.8	9 24 56.8	90 28 46.0	90 50 17.3	−1 5 55.1	− 240.5	911.4	271.0
		Dec. 21	3 39 24.7	. . .	−0 39 6.3	90 54 17.8	−0 51 2.4	− 892.7	924.1	179.9
87	μ Geminorum, E.	1684,	10 8 10.7	9 58 49.7	90 46 35.7	91 3 8.1	−1 3 15.3	+ 530.3	912.1	. .
		Dec. 21	4 13 23.2	. . .	−0 37 31.4	90 54 17.8	−0 51 2.4	− 732.9	904.5	. .

Tabular Exhibit of Reduction of the Occultations—Continued.

THE CASSINIS AND OTHERS AT THE PARIS OBSERVATORY—Continued.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star. Longitudes.	Apparent Position of Moon and Star. Latitudes.	$l'-L$ $b'-B$	S' D	⊙ $L-$⊙
			h m s	*h m s*	° ′ ″	° ′ ″	° ′ ″	″	″	°
88	B. A. C. 3579, I.	1686,	9 55 2	9 45 41	149 21 46.0	149 2 2.1	+4 18 59 1	− 756.1	895.9	94.6
		June 25	16 12 34.3	. . .	+5 8 36.6	149 14 38.2	+4 27 38.4	− 519.3	915.4	54.6
89	B. A. C. 5395 .	1686,	9 22 56	9 13 35	240 53 20.4	241 2 45.7	−0 6 2.2	+ 104.7	988.2	101.3
		July 2	16 7 59.0	. . .	+0 49 10.0	241 1 1.0	−0 9 55.5	+ 235.3	. .	139.7
90	W. II, 1656 . .	1689,	9 38 37	9 29 16	100 17 3.6	99 42 8.6	+4 20 42.3	. .	980.2	61.4
		May 21	13 39 11.9	. . .	+5 7 30.0	. . .	. . .	. .	. .	38
91	136 Tauri, E. .	1690,	11 38 16	11 28 55	85 7 20.7	84 28 59.0	+4 27 39.7	. .	980.3	24.4
		Apr. 13	13 8 24.2	. . .	+5 12 56.4	84 11 28.8	+4 8 32.6	. .	. .	59.8
92	27 Tauri, I. . .	1690,	15 8 29	14 59 8	55 17 48.1	55 46 28.5	+3 46 34.8	− 929.7	991.0	101.3
		July 2	21 54 36.1	. . .	+4 34 51.2	56 1 58.2	+3 53 7.1	− 392.3	1007.0	314.7

LA HIRE.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star. Longitudes.	Apparent Position of Moon and Star. Latitudes.	$l'-L$ $b'-B$	S' D	⊙ $L-$⊙
93	θ^1 Tauri, I. . .	1682,	7 13 52.2	7 4 31.2	63 27 54.6	63 13 44.5	−5 48 7.9	−1010.2	973.3	327 7
		Feb. 15	4 58 18.5	. . .	−5 17 40.1	63 30 34.7	−5 46 53.0	− 74.7	1008.2	95.8
94	θ^2 Tauri, I. . .	1682,	7 16 17.2	7 6 56.2	63 29 18.8	63 14 45.8	−5 48 4.8	− 970.0	973.3	. .
		Feb. 15	5 0 43.9	. . .	−5 17 40.0	63 30 55.8	−5 52 31.8	+ 267.0	1001.3	. .
95	μ Geminorum, I.	1684,	9 34 19.2	9 24 58.2	90 28 46.5	90 50 17.8	−1 5 55.1	− 240.1	911.4	271.0
		Dec. 21	3 39 26.1	. . .	−0 39 6.2	90 54 17.9	−0 51 2.4	− 892.7	924.2	179.9
96	μ Geminorum, E.	1684,	10 7 58.3	9 58 37.3	90 45 58.5	91 3 7.4	−1 3 15.3	+ 529.5	912.1	. .
		Dec. 21	4 13 10.8	. . .	−0 37 31.5	90 54 17.9	−0 51 2.4	− 732.9	904.2	. .
97	H Geminorum, I.	1685,	9 38 49.0	9 29 28	85 44 7.8	86 18 38.8	−0 12 22.5	− 910.5	889.1	205.2
		Oct. 17	23 26 43.3	. . .	+0 26 56.1	86 33 49.3	−0 12 16.2	− 6.3	910.5	241.3
98	α Tauri, I. . .	1699,	13 44 40.8	13 35 19.8	64 56 17.2	65 25 52.2	−5 42 42.0	− 578.1	972.5	146.1
		Aug. 18	23 35 9.6	. . .	−4 57 48.5	65 35 30.3	−5 29 17.2	− 804.8	989.5	279.5
99	α Tauri, E. . .	1699,	14 22 40.8	14 13 19.8	65 18 35.8	65 46 3.1	−5 41 18.4	+ 632.8	974.3	. .
		Aug 18	. . . .	. . .	−4 58 26.7	65 35 30.3	−5 29 17.2	− 721.2	957.4	. .
100	α Tauri, I. . .	1701,	17 59 25.3	17 50 4.3	65 49 34.8	65 27 50.1	−5 17 15.4	− 577.3	914.3	179.5
		Sept. 22	6 6 40.8	. . .	−4 49 46.9	65 37 27.4	−5 29 16.8	+ 721.4	922.5	246.1
101	α Tauri, E. . .	1701,	18 45 43.8	18 36 22.8	66 13 21.0	65 45 30.6	−5 16 33.5	+ 483.2	913.6	. .
		Sept. 22	6 53 6.9	. . .	−4 49 2.1	65 37 27.4	−5 29 16.8	+ 763.3	902.2	. .
102	Jupiter, I. . .	1715,	13 38 38.3	13 29 17.3	51 34 38.5	52 1 38.4	−1 12 28.8	. .	973.0	121.1
		July 24	. . . .	. . .	−0 22 54.8	. . .	. . . .	. .	. .	290
103	Jupiter, E. . .	1715,	14 15 3.8	14 5 42.8	51 55 54.5	. . .	. . . .	. .	974.5	. .
		July 24	. . . .	. . .	−0 24 47.4	. . .	. . . .	. .	. .	. .
104	B. A. C. 8184, I.	1718,	8 42 44.1	8 33 23.1	347 0 21.4	347 8 35.4	−0 55 5.1	− 525.1	888.7	166.6
		Sept. 9	19 56 45.2	. . .	−0 5 15.6	347 17 20.5	−1 7 6.3	+ 721.2	891.9	180.7

Tabular Exhibit of Reduction of the Occultations—Continued.

CASSINI, ETC.—SERIES II

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star. Longitudes.	Latitudes.	$l'-L$ $b'-B$	S' D	☉ $L-$☉
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	′	°
105	33 Capricorni, I.	1705,	15 23 58	15 14 37	313 18 20.7	312 34 29.6	−5 30 7.4	−696.2	998.2	. .
		Aug. 4	0 17 44.2	. . .	−4 48 34.4	312 46 5.8	−5 17 37.6	−749.8	1021.1	. .
106	τ Aquarii, I. .	1705,	11 48 56	11 39 35	334 36 37.7	334 15 32.8	−5 49 17.5	−837.3	1012.0	. .
		Sept. 2	22 36 27	. . .	−4 58 22.8	334 29 30.1	−5 39 2.9	−614.6	1035.3	. .
107	τ Aquarii, E. .	1705,	12 50 19	12 40 58	335 15 49.9	334 45 11.0	−5 44 28.5	+940.9	1011.6	. .
		Sept. 2	23 38 0.3	. . .	−4 57 56.3	334 29 30.1	−5 39 2.9	−325.6	991.3	. .
108	κ¹ Tauri, I. . .	1706,	11 13 34	11 4 13	64 28 16.0	63 53 56.5	+0 45 20.2	−713.9	956.8	. .
		Jan. 23	7 24 46.5	. . .	+1 10 23.8	64 5 50.4	+0 35 44.8	+575.4	916.8	. .
109	λ Cancri, I. . .	1706,	12 31 54	12 22 33	117 34 14.5	117 29 59.4	+4 12 11.9	−784.7	927.4	. .
		Jan. 27	8 59 5.9	. . .	+4 36 33.1	117 43 4.1	+4 21 7.4	−535.5	948.2	. .
110	η Leonis, I. . .	1706,	9 1 9	8 51 48	143 36 0.5	143 35 29.8	+4 42 10.8	−771.7	910.0	. .
		Apr. 21	10 58 56.7	. . .	+5 12 27.8	143 48 21.5	+4 50 56.9	−526.1	931.8	. .

The above times have been computed using CASSINI'S correction for deviation of quadrant. If, instead of this, we use the deviation found on and after May, 1706, the results will be as follows:—

111	33 Capricorni, I.	1705,	15 24 20	15 14 59	313 18 34.5	312 34 41.8	−5 30 6.6	−684.0	998.2	32.1
		Aug. 4	0 18 6.2	. . .	−4 48 34.7	312 46 5.8	−5 17 37.6	−749.0	1012.3	80.7
112	τ Aquarii, I. .	1705,	11 49 11	11 39 50	334 36 47.0	334 15 39.6	−5 49 17.0	−830.5	1012.0	60.0
		Sept. 2	22 36 42.0	. . .	−4 58 22.7	334 29 30.1	−5 39 2.9	−614.1	1029.5	74.5
113	τ Aquarii, E. .	1705,	12 50 34	12 41 13	335 15 59.4	334 45 18.3	−5 44 27.3	+948.2	1011.6	. .
		Sept. 2	23 38 15.3	. . .	−4 57 56.0	334 29 30.1	−5 39 2.9	−324.4	997.5	. .
114	κ¹ Tauri, I. . .	1706,	11 13 52	11 4 31	64 28 26.1	63 54 4.6	+0 45 19.2	−705.8	956.8	03.4
		Jan. 23	7 25 4.6	. . .	+1 10 24.6	64 5 50.4	+0 35 44.8	+574.4	909.6	20.7
115	κ² Tauri, I. . .	1706,	11 36 15	11 26 54	64 40 59 3	64 4 17.9	+0 45 46.6	− 72.8	956.0	. .
		Jan. 23	7 47 31.3	. . .	+1 11 29.3	64 5 30.7	+0 30 6.1	+940.5	943.3	. .
116	κ² Tauri, I. . .	1706,	11 36 58	11 27 37	64 41 23.5	64 4 37.9	+0 45 47.4	− 52.8	955.9	. .
		Jan. 23	7 48 14.4	. . .	+1 11 31.4	64 5 30.7	+0 30 6.1	+941.3	942.8	. .
117	κ² Tauri, E. . .	1706,	11 46 8	11 36 47	64 46 32.0	64 8 53.5	+0 45 55.9	+202.8	955.6	. .
		Jan. 23	7 57 25.9	. . .	+1 11 57.9	64 5 30.7	+0 30 6.1	+949.8	971.2	. .
118	λ Cancri, I. . .	1706,	12 32 12	12 22 51	117 34 24.1	117 30 6.4	+4 12 9.3	−777.7	927.4	07.5
		Jan. 27	8 59 23.8	. . .	+4 36 33.4	117 3 4.1	+4 21 7.4	−538.1	943.8	70.2
119	η Leonis, I. . .	1706,	9 1 29	8 52 8	143 36 10.5	143 35 37.7	+4 42 8.8	−763.8	910.0	31.2
		Apr. 21	10 59 16.6	. . .	+5 12 27.7	143 48 21.5	+4 50 55.5	−526.7	925.7	12.6
120	η Leonis, E. . .	1706,	9 55 5	9 45 44	144 3 23 3	143 56 7.8	+4 38 5.7	+466.3	908.9	. .
		Apr. 21	11 53 1.6	. . .	+5 12 3.8	143 48 21.5	+4 50 55.5	−769.8	899.2	. .
121	λ Virginis, I. .	1706,	10 47 51	10 38 30	212 34 39.4	212 43 0.9	+0 18 36.5	− 518.5	894.7	63.1
		May 24	14 56 2.5	. . .	+1 5 40.3	212 51 39.4	+0 30 54.7	− 738.2	902.2	149.8

Tabular Exhibit of Reduction of the Occultations—Continued.

CASSINI, ETC.—SERIES II—Continued.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star.		$l'-L$ $b'-B$	S' D	⊙ $L-$⊙
						Longitudes.	Latitudes.			
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	″	°
122	*o* Piscium, I.	1706,	11 57 26	11 48 5	23 58 34.0	23 22 46.8	−1 32 54.4	− 969.5	1008.5	235.0
		Nov. 17	3 43 39.2	. . .	−1 3 12.8	23 38 56.3	−1 38 30.3	+ 335.9	1025.7	148.6
123	*ρ* Arietis, I.	1707,	8 21 13	8 11 52	43 25 52.8	42 34 14.9	+1 2 43.7	− 896.3	996.0	14.3
		Apr. 4	9 10 55.4	. . .	+1 33 36.1	42 49 11.2	+1 10 20.6	− 456.9	1005.9	28.5
124	*α* Scorpii, I.	1707,	7 46 54	7 37 33	245 43 16.4	245 31 27.7	−4 43 36 3	− 569.9	889.6	160.5
		Sept. 3	18 35 47.2	. . .	−3 51 23.8	245 40 57.6	−4 31 51.5	− 704.8	905.3	85.2
125	*α* Scorpii, E.	1707,	8 35 6	8 25 45	246 7 3.8	245 49 24.1	−4 43 54.2	+ 506.5	888.4	. .
		Sept. 3	19 24 7.1	. . .	−3 52 50.3	245 40 57.6	−4 31 51.5	− 722.7	881.6	. .
126	Venus, I₁.	1708,	7 17 38	7 8 17	359 32 39.2	358 41 23.2	−1 11 2.1	− 842.8	933.3	334.2
		Feb. 23	5 28 30.4	. . .	−0 46 37.1	358 55 26.0	−1 3 50.1	− 432.0	947.0	24.7
127	Venus, I₂.	1708,	7 17 53	7 8 32	359 32 47.1	358 41 30.9	−1 11 1.6	− 835.9	933.3	. .
		Feb. 23	5 28 45	. . .	−0 46 37.8	358 55 26.8	−1 3 50.0	− 431.6	940.7	. .
128	*χ* Tauri, E.	1708,	9 36 16	9 26 55	63 53 22.1	64 19 54.1	+3 55 9.8	+1015.0	958.1	164.2
		Sept. 6	20 40 16	. . .	+4 46 48.6	64 2 59.1	+3 59 16.4	− 246.6	1042.2	259.9
129	*τ* Leonis, I.	1709,	7 50 27	7 41 6	166 46 11.3	167 15 49.3	−0 21 21.3	− 696.9	985.8	30.5
		Apr. 20	9 45 10.2	. . .	+0 11 9.0	167 27 26.2	−0 33 22.5	+ 721.2	1003.0	137.0
130	*σ* Aquarii, I.	1709,	12 1 48	11 52 27	331 39 29.6	331 10 8.5	−1 27 16.0	− 622.4	889.8	173.7
		Sept. 16	23 44 40.2	. . .	−0 48 34.8	331 20 30.9	−1 12 49.2	− 866.8	1067.0	157.6
131	Pl. Maia, 20 *c*, I.	1709,	8 18 32	8 9 11	54 59 50.1	55 24 11.3	+4 14 8.6	− 816.6	921.1	180.5
		Sept. 23	20 28 23.4	. . .	+5 4 3.9	55 37 47.9	+4 21 35.6	− 447.0	928.9	235.1
132	Pl. Tay., 19 *e*, I.	1709,	8 22 34	8 13 13	55 1 59.0	55 26 33.6	+4 14 24.1	− 268.2	921.3	180.5
		Sept. 23	20 32 24	. . .	+5 4 7.0	55 31 1.8	+4 29 16.7	− 892.6	931.9	235.0
133	22 *l*, I.	1709,	8 41 24	8 32 3	55 12 1.0	55 37 30.8	+4 15 37.5	− 332.8	922.1	. .
		Sept. 23	20 51 19.1	. . .	+5 4 21.4	55 43 3.6	+4 30 16.8	− 879.3	939.9	. .
134	22 *l*, E.	1709,	9 5 32	8 56 11	55 24 53.7	55 51 14.0	+4 17 18.4	+ 490.4	923.2	. .
		Sept. 23	21 15 31.1	. . .	+5 4 39.5	55 43 3.6	+4 30 16.8	− 778.4	919.2	. .
135	Pl. Maia, 20 *c*, E.	1709,	9 8 5	8 58 44	55 26 14.8	55 52 38.9	+4 17 29.4	+ 891.0	923.3	. .
		Sept. 23	21 18 4.5	. . .	+5 4 41.4	55 37 47.9	+4 21 35.6	− 246.2	922.0	. .
136	Pl. Elec., 17 *b*, I.	1710,	4 42 19	4 32 58	54 42 23.6	55 8 13.1	+4 13 13.7	− 886.4	899.9	252.2
		Dec. 4	21 34 29.6	. . .	+4 58 13.0	55 22 59.5	+4 9 36.8	+ 216.9	910.3	163.2
137	22 *l*, I.	1710,	5 40 31	5 31 10	55 12 1.7	55 37 30.5	+4 16 35.4	− 401.3	902.4	. .
		Dec. 4	22 32 51.1	. . .	+4 57 46.0	55 44 11.8	+4 30 18.9	− 823.5	915.4	. .
138	Pl, Ast., 21 *k*, I.	1710,	5 49 8	5 39 47	55 16 25.3	55 41 40.0	+4 17 7.1	− 60.6	902.7	. .
		Dec. 4	22 41 49.5	. . .	+4 57 41.9	55 42 40.6	+4 32 18.0	− 910.9	912.9	. .
139	Pl. Ast., 21 *k*, E.	1710,	6 2 0	5 52 39	55 22 58.4	55 47 46.8	+4 17 55.5	+ 306.2	903.1	. .
		Dec. 4	22 54 23.7	. . .	+4 57 35.7	55 42 40.6	+4 32 18.0	− 862.5	915.2	. .

Tabular Exhibit of Reduction of the Occultations—Continued.

CASSINI, ETC.—SERIES II—Continued.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star.		$l'-L$ $b'-B$	S' D	⊙ $L-$⊙
						Longitudes.	Latitudes.			
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	″	°
140	Pl. Maia, 20 *c*, E.	1710,	6 15 39	6 6 18	55 30 0.1	55 54 10.2	+4 18 47.1	+ 904.2	903.7	. .
		Dec. 4	23 8 4.9	. . .	+4 57 29.0	55 39 6.0	+4 21 37.7	− 170.6	917.6	. .
141	Pl. Maia, 20 *c*, I.	1711,	15 36 40	15 27 19	55 38 44.5	55 26 7.4	+4 14 34.4	− 813.8	897.2	186.9
		Sept. 30	4 13 24.7	. . .	+4 35 32.0	55 39 41.2	+4 21 36.4	− 422.0	914.7	228.8
142	Pl. Tay., 19 *e*, I.	1711,	15 44 39	15 35 18	55 42 41.2	55 28 53.7	+4 14 37.7	− 231.3	897.2	. .
		Sept. 30	4 21 25	. . .	+4 35 23.4	55 32 45.0	+4 29 17.8	− 880.1	909.8	. .
143	Pl. Alcyone, *η*, I.	1711,	16 47 25	16 38 4	56 13 41.1	55 50 58.5	+4 14 23.2	− 445.5	896.3	186.9
		Sept. 30	5 24 21.3	. . .	+4 34 15.1	55 58 24.0	+4 1 15.5	+ 787.7	904.4	229.1
144	Pl. Maia, 20 *c*, E.	1711,	16 52 48	16 43 27	56 16 20.6	55 52 54.4	+4 14 18.5	+ 793 2	896.3	. .
		Sept. 30	5 29 45.2	. . .	+4 34 9.0	55 39 41.2	+4 21 36.5	− 438.0	904.1	. .
145	Pl. Alcyone, *η*, E.	1711,	17 30 54	17 21 33	56 35 9.0	56 6 47.9	+4 13 28.8	+ 504.0	895.5	. .
		Sept. 30	6 7 57.4	. . .	+4 33 26.2	55 58 23.9	+4 1 15.5	+ 733.3	889.2	. .
146	*e* Leonis, I. . .	1712,	11 17 13	11 7 52	170 24 59.6	170 13 46.8	−5 28 30.3	− 492.1	947.4	54.9
		May 15	14 52 9.6	. . .	−4 36 21.7	170 21 58.9	−5 42 15.1	+ 824.8	959.2	115.5
147	*e* Leonis, E. . .	1712,	11 56 26	11 47 5	170 46 51.8	170 32 35.9	−5 30 37.0	+ 637.0	946.3	. .
		May 15	15 31 29.1	. . .	−4 37 13.1	170 21 58.9	−5 42 15.1	+ 698.1	942.2	. .
148	*ο* Tauri, I. . .	1714,	10 25 29	10 16 8	78 55 25.7	78 15 54.4	−1 13 23.9	− 864.7	931.2	0.7
		Mar. 21	10 21 32.0	. . .	−0 40 13.7	78 30 19.1	−1 19 41.6	+ 377.7	943.3	77.8
149	*ξ* Sagittarii, I. .	1714,	15 26 41	15 17 20	278 55 14.3	279 12 36.4	+1 35 55.3	− 904.0	953.4	16.5
		Apr. 6	16 26 38.4	. . .	+2 29 27.0	279 27 40.4	+1 41 53.8	− 358.5	971.4	263.0
150	*ξ* Sagittarii, E. .	1714,	16 39 56	16 30 35	279 36 37.2	279 42 52.7	+1 38 3.7	+ 912.3	955.3	. .
		Apr. 6	17 40 5.5	. . .	+2 32 40.6	279 27 40.4	+1 41 53.8	− 230.1	940.4	. .
151	*δ* Piscium, I. .	1715,	14 59 4	14 49 43	9 59 6.5	9 57 55.7	+2 20 57.1	− 758.3	980.5	118.3
		July 21	22 55 54.4	. . .	+3 4 20.6	10 10 34.0	+2 10 13.3	+ 643.8	994.4	251.9
152	*δ* Piscium, E. .	1715,	15 51 51	15 42 30	10 30 13.4	10 21 33.3	+2 22 26.4	+ 659.3	981.3	. .
		July 21	23 48 50.1	. . .	+3 2 9.1	10 10 34.0	+2 10 13.3	+ 733.1	985.5	. .
153	Jupiter, I. . .	1715,	13 37 59.8	13 28 38.8	51 34 16.0	52 1 12.1	−1 12 28.7	. .	973.0	. .
		July 24	21 46 26.6	. . .	−0 22 52.8	. . .	. . .	. .	. .	. .
154	Jupiter, I. . .	1715,	13 39 15.8	13 29 54.8	51 35 0.6	52 1 56.1	−1 12 28.7	. .	973.1	. .
		July 24	21 47 42.8	. . .	−0 22 56.8	. . .	. . .	. .	. .	. .
155	Jupiter, E. . .	1715,	14 23 46.5	14 14 25.5	52 1 1.6	52 27 6.5	−1 12 14.0	. .	974.9	. .
		July 24	22 32 20.8	. . .	−0 25 14.5	. . .	. . .	. .	. .	. .
156	Jupiter, E. . .	1715,	14 25 2.5	14 15 41.5	52 1 46.0	52 27 49.0	−1 12 13.2	. .	975.0	. .
		July 24	22 33 37.0	. . .	−0 25 18.4	. . .	. . .	. .	. .	. .
157	*κ* Aquarii, I. .	1715,	11 55 55	11 46 34	335 28 18.4	335 18 56.2	+3 53 44.8	− 532.9	980.4	142.2
		Aug. 15	21 30 49.2	. . .	+4 41 49.5	335 27 49.1	+4 7 37.7	− 832.9	988.0	193.3

Tabular Exhibit of Reduction of the Occultations—Continued.

CASSINI, ETC.—SERIES II—Continued.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star.		$l'-L$ $b'-B$	S' D	⊙ $L-$⊙
						Longitudes.	Latitudes.			
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	″	°
158	κ Aquarii, E. .	1715,	12 41 2	12 31 41	335 55 16.3	335 38 53.9	+3 55 37.0	+664.8	981.0	. .
		Aug. 15	22 16 3.6	. . .	+4 40 59.3	335 27 49.1	+4 7 37.7	−720.7	979.4	. .
159	κ Aquarii, I. .	1715,	8 5 9	7 55 48	335 21 14.1	335 14 4.7	+3 58 40.0	−827.8	981.2	195.8
		Oct. 9	21 16 15.9	. . .	+4 47 33.2	335 27 52.5	+4 7 39.0	−539.0	985.8	139.7
160	κ Aquarii, I. .	1715,	7 26 56	7 17 35	335 58 5.1	335 12 49.8	+4 1 41.7	−887.1	942.8	278.4
		Dec. 30	2 1 14.1	. . .	+4 32 20.1	335 27 36.9	+4 7 39.1	−357.4	954.2	57.1
161	α Tauri, I. . .	1717,	9 2 58	8 53 37	65 5 58.6	65 34 44.8	−5 27 15.9	−968.0	953.4	182.5
		Sept. 25	21 21 4.6	. . .	−4 36 58.0	65 50 52.8	−5 29 12.6	+116.7	970.6	243.3
162	α Tauri, E. . .	1717,	9 55 18	9 45 57	65 35 34.9	66 6 26.0	−5 26 26.0	+933.2	956.9	. .
		Sept. 25	22 13 33.2	. . .	−4 38 17.2	65 50 52.8	−5 29 12.6	+166.6	943.5	. .
163	B. A. C. 8184, I.	1718,	8 42 38	8 33 17	347 0 18.3	347 8 32.3	−0 55 4.9	−528.1	888.7	166.6
		Sept. 9	19 56 39.1	. . .	−0 5 15.3	347 17 20.4	−1 7 6.4	+721.5	894.1	180.7
164	α Tauri, I. . .	1719,	7 42 58	7 33 37	66 20 37.3	65 38 20.2	−5 36 44.1	−805.6	910.3	31.9
		Apr. 22	9 43 54.3	. . .	−5 5 1.1	65 51 45.8	−5 29 15.1	−449.0	919.0	34.0
165	α Tauri, E. . .	1719,	8 32 27	8 23 6	66 46 21.3	66 3 25.8	−5 38 46.1	+700.0	908.6	. .
		Apr. 22	10 33 31.4	. . .	−5 4 57.6	65 51 45.8	−5 29 15.1	−571.0	900.8	. .
166	α Tauri, E. . .	1719,	9 43 5	9 33 44	65 41 17.3	66 6 35.0	−5 35 3.4	+828.0	900.0	216.7
		Oct. 30	0 17 23	. . .	−4 55 43.1	65 52 47.0	−5 29 12.9	−350.5	895.6	209.2
167	γ Tauri, I. . .	1719,	7 4 40	6 55 19	61 14 15.3	61 40 20.4	−5 38 14.7	−790.4	899.5	243.9
		Nov. 26	23 24 58.9	. . .	−4 56 4.8	61 53 30.8	−5 45 47.7	+453.0	907.6	178.0
168	γ Virginis, I. .	1720,	12 24 2	12 14 41	186 10 47.0	186 11 16.5	+3 4 44.3	−337.3	1003.2	31.2
		Apr. 20	14 20 50.5	. . .	+3 53 48.0	186 16 53.8	+2 49 1.7	+942.6	1001.0	155.1
169	γ Virginis, E. .	1720,	12 49 49	12 40 28	186 26 49.2	186 23 53.4	+3 4 4.2	+419.6	1002.7	. .
		Apr. 20	14 46 41.8	. . .	+3 54 41.2	186 16 53.8	+2 49 1.7	+902.5	995.1	. .
170	Pl. Elec., 17 *b*, I.	1727,	14 1 21	13 52 0	55 7 6.4	55 21 32.1	+4 13 4.4	−915.6	924.9	164.0
		Sept. 6	1 3 42.1	. . .	+4 44 15.7	55 36 47.7	+4 9 41.5	+202.9	935.4	251.6
171	Pl. Cel., 16 *g*, I.	1727,	14 7 11	13 57 50	55 10 9.8	55 23 55.9	+4 13 36.2	−855.6	925.0	. .
		Sept. 6	1 9 33.1	. . .	+4 44 23.2	55 38 11.5	+4 20 12.7	−396.5	941.4	. .
172	Pl. Tay., 19 *e*, I. .	1727,	14 40 5	14 30 44	55 27 25.5	55 37 11.4	+4 16 28.9	−526.4	926.0	. .
		Sept. 6	1 42 32.5	. . .	+4 45 5.7	55 45 57.8	+4 29 23.1	−774.2	935.2	. .
173	Pl. Maia, 20 *c*, I.	1727,	14 42 16	14 32 55	55 28 34.0	55 38 3.3	+4 16 39.9	−890.7	926.0	. .
		Sept. 6	1 44 43.8	. . .	+4 45 8.3	55 52 54.0	+4 21 41.9	−302.0	938.2	. .
174	Pl. Elec., 17 *b*, E.	1727,	15 10 15	15 0 54	55 43 14.5	55 48 59.6	+4 18 57.8	+731.9	926.6	164.0
		Sept. 6	2 12 47.4	. . .	+4 45 43.9	55 36 47.7	+4 9 41.5	+556.3	917.6	251.8
175	Pl. Cel., 16 *g*, E.	1727,	15 20 39	15 11 18	55 48 42.1	55 53 0.7	+4 19 47.1	+889.2	926.8	. .
		Sept. 6	2 23 13.1	. . .	+4 45 57.1	55 38 11.5	+4 20 12.7	− 25.6	887.1	. .

Tabular Exhibit of Reduction of the Occultations—Continued.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star.		$l'-L$ $b'-B$	S' D	⊙ $L-$⊙
						Longitudes.	Latitudes.			
CASSINI, ETC.—SERIES II—Continued.										
			h *m* *s*	*h* *m* *s*	° ′ ″	° ′ ″	° ′ ″	″	″	°
176	Pl. Tay., 19 *e*, E.	1727,	15 35 59	15 26 38	55 56 44.3	55 58 51.8	+4 20 56.0	+774.0	927.1	. .
		Sept. 6	2 38 35.7	. . .	+4 46 16.5	55 45 57.8	+4 29 23.1	−507.1	923.4	. .
177	Pl. Maia, 20 *c*, E.	1727,	16 0 38	15 51 17	56 9 10.5	56 8 12.7	+4 22 40.8	+918.7	927.5	. .
		Sept. 6	3 3 18.7	. . .	+4 46 47.5	55 52 54.0	+4 21 41.9	+ 58.9	917.9	. .
178	*a* Tauri, I. . .	1738,	9 44 42	9 35 21	66 0 50.9	65 53 42.1	−5 34 18.2	−857.2	903.4	282.5
		Jan. 2	4 33 51.4	. . .	−5 5 36.1	66 7 59.3	−5 29 10.4	−307.8	907.1	143.6
179	*a* Tauri, E. . .	1738,	11 5 57	10 56 36	66 41 44.9	66 22 36.9	−5 32 41.3	+877.6	903.2	. .
		Jan. 2	5 55 19.8	. . .	−5 5 15.5	66 7 59.3	−5 29 10.4	−210.9	898.5	. .
180	*a* Tauri, I. . .	1738,	5 33 53	5 24 32	65 27 45.8	65 54 44.5	−5 24 22.3	−845.3	889.6	272.1
		Dec. 23	23 41 58.3	. . .	−4 43 45.5	66 8 49.8	−5 29 09.8	+287.5	889.3	154.0
181	*a* Tauri, E. . .	1738,	6 33 54	6 24 33	65 57 27.1	66 20 43.7	−5 20 15.1	+713.9	891.6	. .
		Dec. 23	0 42 9.2	. . .	−4 42 41.3	66 8 49.8	−5 29 10.0	+ 534.9	889.5	. .
182	*o* Tauri . . .	1739,	7 0 10	6 50 49	59 16 41.4	59 2 40.0	−5 29 58.5	.	. .	327.0
		Feb. 15	4 41 23.5	. . .	−5 1 7.4	. . .	. . .	. .	. . .	111.9
DELISLE AT LUXEMBOURG.										
183	*τ* Tauri, I. . .	1713,	11 58 24.3	11 49 3.3	68 5 59.0	67 59 16.1	+0 29 10.8	−643.4	939.0	249.4
		Dec. 1	4 41 1.5	. . .	+0 53 38.8	68 9 59.5	+0 40 45.7	−694.9	946.8	178.8
184	B. A. C. 1373, I.	1714,	9 16 0.2	9 6 39.2	65 15 35.8	64 33 0.2	+0 3 0.7	−555.3	947.5	359.7
		Mar. 20	9 7 55.2	. . .	+0 32 12.3	64 42 15.5	−0 9 54.6	+775.3	953.6	65
185	*o* Tauri, I. . .	1714,	10 25 28.9	10 16 7.9	78 55 25.6	78 15 54.9	−1 13 24.4	−864.5	931.2	0.7
		Mar. 21	10 21 31.9	. . .	−0 40 13.7	78 30 19.4	−1 19 41.4	+377.0	943.5	77.8
186	*ξ* Sagittarii, I. .	1714,	15 26 41.6	15 17 20.6	278 55 14.8	279 12 36.7	+1 35 55.7	−903.3	953.4	16.5
		Apr. 6	16 26 39.0	. . .	+2 29 27.0	279 27 40.0	+1 41 53.7	−358.0	971.4	262
187	*ξ* Sagittarii, E. .	1714,	16 39 56.3	16 30 35.3	279 36 36.7	279 42 52.2	+1 38 3.6	+912.2	955.3	. .
		Apr. 6	17 40 5.8	. . .	+2 32 40.6	279 27 40.0	+1 41 53.7	−230.1	940.4	. .
188	*ω*² Tauri, E. . .	1714,	9 10 0.7	9 0 39.7	61 49 47.1	62 19 5.6	−0 54 23.9	+841.8	965.4	184.2
		Sept. 27	21 34 56.8	. . .	−0 4 38.7	62 5 3.8	−0 46 57.9	−446.0	952.5	237.9
189	*a* Cancri, E. . .	1714,	14 47 21.3	14 38 0.3	129 8 31.3	129 52 43.4	−5 12 53.9	+800.3	899.7	189.1
		Oct. 2	3 32 55.6	. . .	−4 45 8.6	129 39 23.1	−5 6 9.6	−404.3	893.6	300.6
190	*a* Tauri, I. . .	1717,	9 3 4.3	8 53 44.0	65 5 42.7	65 34 48.7	− 5 27 16.2	−964.2	953.4	182.5
		Sept. 25	21 21 10.9	. . .	−4 36 58.2	65 50 52.9	−5 29 12.6	+116.4	966.9	243.3
191	*a* Tauri, E. . .	1717,	9 55 23.0	9 46 2.7	65 35 38.3	66 6 28.5	−5 26 27.3	+935.6	956.0	. .
		Sept. 25	22 13 38.2	. . .	−4 38 18.5	65 50 52.9	−5 29 12.6	+165.3	946.0	. .
192	*λ* Geminorum, I.	1718,	13 33 55.0	13 24 34.7	105 0 55.2	104 42 27.3	−5 25 9.9	−524.7	1014.1	295.2
		Jan. 15	9 14 20.3	. . .	−4 49 15.7	104 51 12.0	−5 39 54.6	+884.7	1028.0	169.6

Tabular Exhibit of Reduction of the Occultations—Continued.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star. Longitudes.	Apparent Position of Moon and Star. Latitudes.	$l'-L$ $b'-B$	S' D	⊙ $L-\odot$
DELISLE AT LUXEMBOURG—Continued.										
			h m s	*h m s*	° ′ ″	° ′ ″	° ′ ″	″	″	°
193	*α* Tauri, I. . .	1718,	6 31 35.	6 22 15.1	65 35 41.5	65 35 6.5	−5 25 41.1	−961.4	965.9	320.6
		Feb. 9	3 49 25.2	. . .	−4 53 48.7	65 51 7.9	−5 29 16.2	+215.1	981.2	105.3
194	B. A. C. 8184, I.	1718,	8 42 37.2	8 33 16.9	347 0 18.3	347 8 31.9	−0 55 5.3	−528.7	888.7	166.6
		Sept. 9	19 56 38.3	. . .	−0 5 15.3	347 17 20.6	−1 7 6.4	+721.1	894.1	180.7
195	*α* Tauri, I. . .	1719,	7 42 53.8	7 33 33.5	66 20 35.5	65 38 19.2	−5 36 44.4	−806.6	910.3	31.9
		Apr. 22	9 43 19.9	. . .	−5 5 1.1	65 51 45.8	−5 29 15.1	−449.3	920.2	34.0
196	*α* Tauri, E. . .	1719,	8 32 35.4	8 23 15.1	66 46 25.9	66 3 31.1	−5 38 47.1	+705.3	908.6	. .
		Apr. 22	10 33 39.8	. . .	−5 4 57.6	65 51 45.8	−5 29 15.1	−572.0	905.4	. .
197	*γ* Libræ, I. . .	1719,	7 43 32.1	7 34 11.8	231 6 8.6	230 57 14.1	+4 20 39.8	−948.5	970.7	148.0
		Aug. 21	17 41 31.6	. . .	+5 15 17.0	231 13 2.6	+4 24 59.7	−259.9	980.8	83.2
198	*α* Tauri, I. . .	1719,	8 46 49.1	8 37 23.8	65 12 52.6	65 40 52.6	−5 38 19.0	−714.3	897.8	216.7
		Oct. 30	23 20 57.8	. . .	−4 56 10.8	65 52 46.9	−5 29 12.9	−546.1	896.5	209.2
199	*α* Tauri, E. . .	1719,	9 43 24.1	9 34 3.8	65 41 27.0	66 6 42.5	−5 35 2.8	+835.6	900.0	. .
		Oct. 30	0 17 42.1	. . .	−4 55 42.9	65 52 46.9	−5 29 12.9	−349.9	902.4	. .
200	A¹ Tauri, I. . .	1725,	12 25 33.2	12 16 12.9	60 8 2.9	59 20 55.2	+1 9 51.6	−951.0	969.4	331.5
		Feb. 19	10 24 58.7	. . .	+1 44 5.5	59 36 46.2	+1 13 59.4	−247.8	982.4	88.1
DELISLE AT ST. PETERSBURG.										
201	9 Tauri, I. . .	1727,	8 54 1.8	6 52 48.3	53 56 31.8	53 22 13.0	+3 40 29.4	−940.0	936.0	339.0
		Feb. 27	7 22 12.1	. . .	+4 12 43.8	53 37 53.0	+3 41 39.7	− 70.3	940.7	74.6
202	Pl. Elec., 17 *b*, I.	1729,	16 35 57 9	14 34 44.4	56 1 25.8	55 24 28.3	+4 13 28.1	−866.1	888.8	252.0
		Dec. 3	9 27 24.9	. . .	+4 48 14.2	55 38 54.4	+4 9 44.1	+224.0	892.4	163.6
203	Pl. Cel., 16 *g*, I.	1729,	16 41 39.6	14 40 26.1	56 4 15.3	55 27 15.0	+4 13 7.6	−782.3	888.6	. .
		Dec. 3	9 33 7.5	. . .	+4 48 9.1	55 40 17.3	+4 20 15.2	−427.6	889.6	163.7
204	Pl. Maia, 20 *c*, I.	1729,	17 16 56.6	15 15 43.1	56 21 45.5	55 44 48.7	+4 10 56.0	−611.2	887.6	252.0
		Dec. 3	10 8 30.3	. . .	+4 47 38.9	55 54 59.9	+4 21 44.6	−648.6	890.0	163.9
205	Pl. Mer., 23 *d*, I.	1729,	17 31 47.4	15 30 33.9	56 29 6.9	55 52 22.6	+4 9 58.5	−225.2	887.2	. .
		Dec. 3	10 23 23.6	. . .	+4 47 26.0	55 56 7.8	+3 55 41.2	+857.3	886.2	. .
206	Pl. Alcy., *η*, I. .	1729,	17 48 13.8	15 47 0.3	56 37 16.5	56 0 52.7	+4 8 53.6	−770.1	886.8	252.0
		Dec. 3	10 39 52.7	. . .	+4 47 11.7	56 13 42.8	+4 1 23.6	+450.0	890.3	164.2
207	Pl. Pleio., 28 *h*, I.	1729,	18 32 17.4	16 31 3.9	56 59 8.0	56 24 16.1	+4 5 54.9	−759.8	885.6	. .
		Dec. 3	11 24 3.5	. . .	+4 46 32.7	56 36 55.9	+3 58 11.5	+463.4	888.4	. .
208	Pl. Atlas, 27 *f*, I.	1729,	18 37 35.6	16 36 22.1	57 1 45.3	56 27 8.5	+4 5 33.1	−503.0	885.5	252.0
		Dec. 3	11 29 22.6	. . .	+4 46 28.0	56 35 31.5	+3 53 22.7	+730.4	886.2	164.6
209	*ν* Geminorum, I.	1733,	7 33 8.8	5 31 55.3	92 58 9.1	92 48 44.7	−3 8 12.4	−962.1	959.2	2.5
		Mar. 22	7 33 55.6	. . .	−2 30 39.3	93 4 46.8	−3 5 22.4	−170.0	975.7	90.6

Tabular Exhibit of Reduction of the Occultations—Continued.

DELISLE AT ST. PETERSBURG—Continued.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star.		$l'-L$ $b'-B$	S D	⊙ $L-⊙$
						Longitudes.	Latitudes.			
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	″	°
210	κ Cancri, I. . .	1733,	7 27 49.6	5 26 36.1	131 59 57.7	132 19 49.8	−5 21 52.2	−436.7	940.8	5.4
		Mar. 25	7 40 25.5	. . .	−4 44 16.9	132 27 6.5	−5 35 30.1	+817.9	926.2	126
211	α Tauri, I. . .	1736,	10 19 54.3	8 18 40.8	66 28 28.0	65 54 2.8	−5 19 5.0	−718.0	929.9	25.3
		Apr. 14	11 52 54.3	. . .	−4 34 4.4	66 6 0.8	−5 29 11.0	+606.0	937.1	40.8
212	α Tauri, I. . .	1736,	18 16 12.2	16 14 58.7	65 47 53.8	65 50 44.7	−5 26 4.0	−937.3	944.3	130.0
		Aug. 1	3 0 15.0	. . .	−4 45 7.2	66 6 22.0	−5 29 7.9	+183.9	951.0	296.1
213*	α Tauri, E. . .	1736,	19 27 50.9	17 26 37.4	66 27 12.6	66 21 51.0	−5 25 29.5	+929.0	945.5	. .
		Aug. 1	4 12 5.5	. . .	−4 46 27.7	66 6 22.0	−5 29 7.9	+218.4	950.2	. .
214	α Tauri, I. . .	1736,	14 44 52.4	12 43 38.9	66 1 50.4	65 51 26.5	−5 28 59.3	−932.5	923.0	209.9
		Oct. 22	4 51 38.1	. . .	−4 51 35.1	66 6 59.0	−5 29 8.4	+ 9.1	928.3	216.2
215*	α Tauri, E. . .	1736,	15 59 43.4	13 58 29.9	66 41 17.0	66 22 29.9	−5 29 32.4	+930.9	922.7	. .
		Oct. 22	6 6 41.4	. . .	−4 52 50.2	66 6 59.0	−5 29 8.4	− 24.0	927.0	. .
216	ξ Leonis, I. . .	1737,	9 41 20.8	7 40 7.3	137 52 4.6	137 43 46.8	−3 14 42.9	−927.7	959.7	47.5
		May 7	12 43 57.9	. . .	−2 24 48.7	137 59 14.5	−3 10 0.6	−282.3	968.3	90.5
217	Jupiter . . .	1737,	15 56 26.8	13 55 13.3	349 23 4.0	349 23 34.7	−1 16 6.0	. .	892.7	61.9
		May 22	19 59 13.8	. . .	−0 23 23.4	. . .	. . .	. .	. .	. .
218	θ^1 Tauri, I. . .	1737,	13 3 21.9	11 2 8.4	63 48 15.7	64 5 45.9	−6 0 35.8	−677.7	903.0	120.2
		July 22	21 6 10.4	. . .	−5 8 39.6	64 17 3.6	−5 46 27.0	−848.8	1084	304.1
219	θ^1 Tauri, E. . .	1737,	13 35 46.1	11 34 32.6	64 4 51.3	64 23 30.4	−5 59 54.7	+386.8	903.9	. .
		July 22	21 38 39.9	. . .	−5 8 48.6	64 17 3.6	−5 46 27.0	−807.7	894.7	. .
220	θ^2 Tauri, E. . .	1737,	13 48 22.3	11 47 8.8	64 11 22.6	64 30 16.2	−5 59 36.5	+783.8	904.3	. .
		July 22	21 51 18.2	. . .	−5 8 52.1	64 17 12.4	−5 52 4.7	−451.8	901.1	. .
221	71 Tauri, I. . .	1738,	6 20 4.0	4 18 50.5	63 21 44.4	63 33 34.8	−5 49 41.7	−531.7	898.6	282.5
		Jan. 2	1 8 21.3	. . .	−5 6 30.8	63 42 26.5	−6 1 45.8	+724.1	896.7	141
222	θ^1 Tauri, I. . .	1738,	7 29 38.5	5 28 25.0	63 56 39.1	64 2 31.6	−5 47 3.0	−909.2	900.0	. .
		Jan. 2	2 18 7.3	. . .	−5 6 23.5	64 17 40.8	−5 46 29.8	− 33.2	905.2	. .
223	θ^2 Tauri, I. . .	1738,	7 32 54.5	5 31 41.0	63 58 17.7	64 3 50.7	−5 46 55.9	−852.2	900.1	. .
		Jan. 2	2 21 23.8	. . .	−5 6 23.0	64 18 2.9	−5 52 7.6	+311.7	903.3	. .
224	B. A. C. 1391, I.	1738,	8 51 3.5	6 49 50.0	64 37 35.2	64 34 55.8	−5 44 21.0	−801.7	901.1	. .
		Jan. 2	3 39 45.6	. . .	−5 6 9.7	64 48 17.5	−5 37 7.1	−433.9	908.2	. .
225	α Tauri, I. . .	1738,	12 23 37.8	10 22 24.3	66 24 30.5	65 59 16.2	−5 41 30.2	−523.0	900.1	282.5
		Jan. 2	7 12 54.9	. . .	−5 5 25.2	66 7 59.2	−5 29 10.5	−739.7	904.5	143.6
226	α Tauri, E. . .	1738,	13 3 17.8	11 2 4.3	66 44 30.5	66 16 7.8	−5 41 45.7	+488.6	899.4	. .
		Jan. 2	7 52 41.4	. . .	−5 5 14.0	66 7 59.2	−5 29 10.5	−755.2	898.2	. .

*By reference to the original notes, it will be seen that the observer was dubious whether both emersions were not too late. The results strongly indicating it, both must be rejected.

Tabular Exhibit of Reduction of the Occultations—Continued.

DELISLE AT ST. PETERSBURG—Continued.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star.		$l'-L$ $b'-B$	S' D	⊙ $L-$⊙
						Longitudes.	Latitudes.			
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	″	°
227	*f* Geminorum, I.	1738,	8 9 48.5	6 8 35.0	109 32 40.8	109 54 37.4	−4 0 25.7	−415.9	930.2	314.0
		Feb. 2	5 0 37.1	. . .	−3 24 10.2	110 1 33.3	−3 46 28.2	−837.5	934.6	156.0
228	71 Tauri, I. . .	1738,	15 3 10.0	13 1 56.5	63 14 4.8	63 29 33.3	−5 54 24.5	−781.2	893.2	. .
		Aug. 8	0 12 22.3	. . .	−5 9 17.0	63 42 34.5	−6 1 48.9	+444.4	895.1	. .
229	71 Tauri, E. . .	1738,	15 59 5.9	13 57 52.4	63 41 45.1	63 53 44.5	−5 51 43.7	+670.0	894.6	. .
		Aug. 8	1 8 27.3	. . .	−5 8 43.9	63 42 34.5	−6 1 48.9	+605.2	895.1	. .
230	θ^1 Tauri, I. . .	1738,	16 21 50.7	14 20 37.2	63 53 0.3	64 3 13.5	−5 50 37.7	−874.8	895.0	136.2
		Aug. 8	1 31 15.9	. . .	−5 8 29.1	64 17 48.3	−5 46 26.3	−251.4	905.9	288.1
231	θ^2 Tauri, I. . .	1738,	16 22 7.7	14 20 54.2	63 53 8.6	64 3 20.4	−5 50 37.0	−890.0	895.0	. .
		Aug. 8	1 31 32.9	. . .	−5 8 29.0	64 18 10.4	−5 52 4.1	+ 87.1	889.6	. .
232	α Tauri, I. . .	1738,	21 18 5.4	19 16 51.9	66 19 34.9	65 58 46.4	−5 40 50.3	−559.6	895.7	136.2
		Aug. 8	6 28 19.3	. . .	−5 5 7.4	66 8 6.0	−5 29 7.4	−702.9	396.8	289.9
233	α Tauri, E. . .	1738,	22 7 49.3	20 6 35.8	66 44 11.4	66 18 49.8	−5 40 26.0	+643.8	894.9	. .
		Aug. 8	7 18 11.3	. . .	−5 4 29.8	66 8 6.0	−5 29 7.4	−678.6	933.7	. .
234	α Tauri, I. . .	1738,	11 57 37.2	9 56 23.7	65 41 42.6	65 56 41.5	−5 38 13.2	−710.1	894.3	189.6
		Oct. 2	0 43 9.6	. . .	−4 54 25.3	66 8 31.6	−5 29 7.5	−545.7	892.9	236.5
235	α Tauri, E. . .	1738,	12 57 57.8	10 56 44.3	66 11 38.5	66 22 16.7	−5 35 11.1	+825.1	895.5	. .
		Oct. 2	1 43 40.0	. . .	−4 53 39.3	66 8 31.6	−5 29 7.5	−363.6	898.2	. .
236	85 Geminorum, I.	1739,	13 40 53.4	11 39 39.9	112 41 42.4	113 10 53.3	−0 58 55.8	−856.5	895.3	210.2
		Oct. 23	3 48 33.1	. . .	−0 24 38.1	113 25 9.8	−0 54 24.6	−271.2	898.3	263.2
237	85 Geminorum, E.	1739,	14 51 33.8	12 50 20.3	113 16 26.1	113 40 6.7	−0 54 33.5	+896.9	896.8	. .
		Oct. 23	4 59 25.2	. . .	−0 21 34.3	113 25 9.8	−0 54 24.6	− 8.9	896.8	. .
238	δ Cancri, I. . .	1739,	13 10 56.5	11 9 43.0	124 14 36.1	124 50 28.8	+0 2 2.3	−882.9	893.5	211.2
		Oct. 24	3 22 27.8	. . .	+0 36 32.6	125 5 11.7	+0 4 8.3	−126.0	891.8	273.9
239	δ Cancri, E. . .	1739,	14 17 18.4	12 16 4.9	124 47 15.2	125 19 58.0	+0 6 33.7	+886.3	895.4	. .
		Oct. 24	4 29 0.6	. . .	+0 39 24.6	125 5 11.7	+0 4 8.3	+145.4	898.2	. .
240	Pl. Elec., 17 *b*, I.	1746,	8 20 40.0	6 19 26.5	56 12 58.4	55 37 4.7	+4 8 6.8	−894.7	896.7	6.2
		Mar. 26	8 36 46.1	. . .	+4 41 2.6	55 51 59.4	+4 9 50.7	−103.9	898.4	49.7
241	Pl. Cel., 16 *g*, I.	1746,	8 38 7.0	6 36 53.5	56 21 14.9	55 45 16.0	+4 7 48.2	−487.3	896.3	. .
		Mar 26	8 54 15.9	. . .	+4 41 24.7	55 53 23.3	+4 20 22.0	−753.8	896.9	. .
242	Pl. Mer., 23 *d*, I.	1746,	9 7 51.3	7 6 37.8	56 36 34.2	55 59 33.3	+4 7 9.0	−580.5	895.7	. .
		Mar. 26	9 24 5.1	. . .	+4 42 2.0	56 9 13.8	+3 55 48.0	+681.0	893.9	. .
243	*p*, I. .	1746,	9 30 38.3	7 29 24.8	56 47 57.8	56 10 47.3	+4 6 34.1	−863.1	895.1	. .
		Mar. 26	9 46 55.9	. . .	+4 42 30.5	56 25 10.4	+4 2 32.3	+241.8	894.3	. .
244	Pl. Alcyone, η, I.	1746,	9 34 36.6	7 33 23.1	56 49 57.0	56 12 46.3	+4 6 27.6	−847.8	895.0	. .
		Mar. 26	9 50 54.8	. . .	+4 42 35.4	56 26 54.1	+4 1 30.7	+296.9	896.3	. .

Tabular Exhibit of Reduction of the Occultations—Continued.

DELISLE AT ST. PETERSBURG—Continued.

No.	Star occulted.	Date.	Local mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star.		$l'-L$ $b'-B$	S' D	☉ $L-☉$
						Longitudes.	Latitudes.			
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	″	°
245	Pl. Pleio., 28 *h*, I.	1746,	10 21 25.6	8 20 12.1	57 13 22.5	56 36 44.4	+4 5 3.9	−797.6	893.9	. .
		Mar. 26	10 37 51.5	. . .	+4 43 33.2	56 50 2.0	+3 58 18.2	+405.7	892.6	. .
246	Pl. Bessel 8, I. .	1746,	9 1 43.7	7 0 30.2	56 33 30.3	55 56 34.6	+4 7 17.9	−877.7	895.8	. .
		Mar. 26	9 17 56.5	. . .	+4 41 54.4	56 11 12.3	+4 10 31.3	−193.4	896.5	. .
247	Pl. Bessel 9, I. .	1746,	9 2 28.4	7 1 14.9	56 33 52.6	55 56 56.3	+4 7 16.7	−882.2	895.8	. .
		Mar. 26	9 18 41.3	. . .	+4 41 55.3	56 11 38.5	+4 10 6.0	−169.3	896.0	. .
248	Pl. Bessel 4, I. .	1746,	9 5 18.7	7 4 5.2	56 35 17.8	55 58 19.0	+4 7 12.7	−404.8	895.7	. .
		Mar. 26	9 21 32.1	. . .	+4 41 58.8	56 5 3.8	+4 20 33.1	−800.4	896.5	. .
249	Pl. Bessel 10, I.	1746,	9 11 40.8	7 10 27.3	56 38 28.9	56 1 25.4	+4 7 3.7	−815.6	895.5	. .
		Mar. 26	9 27 55.2	. . .	+4 42 6.8	56 15 1.0	+4 13 20.9	−377.2	896.6	. .
250	Pl. Bessel 15, I.	1746,	9 28 28.7	7 27 15.2	56 46 53.0	56 9 42.8	+4 6 37.7	−877.5	895.1	. .
		Mar. 26	9 44 45.9	. . .	+4 42 27.8	56 24 20.3	+4 3 27.8	+189.9	895.7	. .
251	Pl. Bessel 18, I.	1746,	9 29 44.4	7 28 30.9	56 47 30.9	56 10 20.6	+4 6 35.6	−885.5	895.1	. .
		Mar. 26	9 46 1.8	. . .	+4 42 29.4	56 25 6.1	+4 3 57.5	+158.1	897.3	. .
252	Pl. Bessel 29, I.	1746,	10 9 20.1	8 8 6.6	57 7 19.4	56 30 26.8	+4 5 26.8	−787.8	894.2	. .
		Mar. 26	10 25 44.0	. . .	+4 43 18.3	56 43 34.6	+4 12 32.1	−425.3	893.5	. .
253	Pl. Cel., 16 *g*, I.	1747,	13 1 48.5	11 0 35.0	56 23 11.7	55 46 42.0	+4 33 5.9	−464.3	892.5	300.6
		Jan. 20	9 1 27.7	. . .	+5 6 42.3	55 54 26.3	+4 20 22.6	+763.3	892.7	115.3
254	Pl. Tay., 19 *e*, I.	1747,	13 3 55.5	11 2 42.0	56 24 14.6	55 47 42.2	+4 33 1.5	−870.5	892.5	. .
		Jan. 20	9 3 35.1	. . .	+5 6 43.3	56 2 12.7	+4 29 33.1	+208.4	892.5	. .
255	Pl. Ast., 21 *k*, I.	1747,	13 25 4.4	11 23 50.9	56 34 43.3	55 57 49.2	+4 32 14.8	−894.4	888.6	. .
		Jan. 20	9 24 47.4	. . .	+5 6 52.6	56 12 43.6	+4 32 32.2	− 17.4	891.8	. .
256	Pl. Maia, 20 *c*, I.	1747,	13 26 21.5	11 25 8.0	56 35 21.5	55 58 26.5	+4 32 11.9	−642.4	888.6	. .
		Jan. 20	9 26 4.7	. . .	+5 6 53.1	56 9 9.0	+4 21 51.8	+620.1	891.5	. .
257	22 *l*, I.	1747,	13 28 21.5	11 27 8.0	56 36 20.9	55 59 24.5	+4 32 7.2	−890.4	891.8	. .
		Jan. 20	9 28 5.1	. . .	+5 6 54.0	56 14 14.9	+4 30 33.1	+ 94.1	892.6	. .
258	Pl. Tay., 19 *e*, E.	1747,	13 15 12.5	11 13 59.0	56 0 54.0	56 17 10.9	+4 27 30.7	+887.1	892.5	127.4
		July 30	21 47 56.1	. . .	+5 14 49.9	56 2 23.8	+4 29 30.3	−119.6	892.5	288.6
259	Pl. Bessel 4, E. .	1747,	13 19 33.5	11 18 20.0	56 3 3.3	56 19 21.4	+4 27 43.4	+783.5	892.6	. .
		July 30	21 52 17.8	. . .	+5 14 49.9	56 6 17.9	+4 20 30.9	+432.5	892.9	. .
260	Pl. Maia, 20 *c*, E.	1747,	13 26 37.5	11 25 24.0	56 6 33.4	56 22 52.2	+4 28 4.5	+812.2	892.8	. .
		July 30	21 59 23.0	. . .	+5 14 50.0	56 9 20.0	+4 21 49.1	+375.4	892.6	. .

Tabular Exhibit of Reduction of the Occultations—Continued.

FLAMSTEED AT GREENWICH.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star. Longitudes.	Apparent Position of Moon and Star. Latitudes.	$l'-L$ $b'-B$	S D	⊙ $L-$⊙
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	″	°
261	ζ Arietis, I.	1676,	7 16 29	. . .	47 50 0.7	47 11 24.2	+2 45 29.8	− 845.1	892.8	358.7
		Mar. 18	7 4 57.6	. . .	+3 9 51.1	47 25 29.3	+2 51 45.7	− 375.9	924.0	48.7
262	28 (*g*) Gem., I.	1676,	13 17 30	. . .	110 50 41.7	110 22 10.7	−2 50 21.1	− 752.9	919.3	3.7
		Mar. 23	13 26 40.7	. . .	−2 4 28.7	110 34 43.6	−2 40 44.5	− 576.6	947.6	106.9
263	κ Aquarii, E.	1676,	11 30 10	. . .	334 57 33.0	335 10 54.0	+4 6 47.5	+ 952.6	942.4	98.5
		June 29	18 5 25.5	. . .	+5 1 25.5	334 55 1.4	+4 7 45.0	− 57.5	951.9	236.4
264	*o* Sagittarii, I.	1676,	8 16 45	. . .	280 13 24.6	280 14 10.2	+0 45 54.0	− 875.1	974.8	147.3
		Aug. 19	18 12 33.0	. . .	+1 42 46.2	280 28 45.3	+0 56 22.9	− 628.9	1078.4	133.2
265	Mars, I.	1676,	12 17 23	. .	77 25 29.8	77 55 41.3	−0 32 56.6	− 799.1	892.6	158.8
		Aug. 31	23 1 9.2	. . .	+0 9 26.0	78 9 0.4	−0 28 0.4	− 296.2	852.2	279.4
266	Mars, E.	1676,	13 18 10	. . .	77 55 28.0	78 25 14.5	−0 32 7.6	+ 886.8	894.9	. .
		Aug. 31	0 2 6.2	. . .	+0 6 46.4	78 10 27.7	−0 27 57.6	− 250.0	921.3	. .
267	π Sagittarii, I.	1676,	5 40 55	. . .	281 53 32.9	281 28 45.2	+1 35 29.5	− 938.0	985.5	227.9
		Nov. 9	20 59 35	. . .	+2 28 36.6	281 44 23.2	+1 28 47.9	+ 401.6	1020.0	53.8
268	Not identified	1677,	12 17 7	. . .	64 39 50.8	64 0 16.9	−0 20 41.4	. .	893.9	349.5
		Mar. 9	11 29 58.8	. . .	+0 16 32.4	. . .	. . .	. .	. .	. .
269	ρ² Sagittarii, I.	1678,	7 6 32	. . .	284 49 30.4	284 40 21.8	+3 53 35.7	− 953.3	969.2	181.8
		Sept. 24	19 22 10.0	. . .	+4 48 9.2	284 56 15.1	+3 48 36.1	+ 299.6	997.2	103.1
270	Not identified	1678,	8 28 20	. . .	. . .	. . .	. . .	. .	. .	216.4
		Oct. 29	. . .	. . .	. . .	. . .	. . .	. .	. .	. .
271	Lalande 4903	1678,	8 35 38	. . .	37 3 53.8	37 17 2.7	−0 47 5.6	. .	980.7	. .
		Oct. 29	23 9 30.1	. . .	−0 0 59.9	. . .	. . .	. .	. .	. .
272	*a* Cancri, I.	1680,	9 1 24	. . .	128 15 55.5	128 55 21.3	−5 1 19.4	− 929.2	939.3	296.8
		Jan. 16	4 45 50.8	. . .	−4 31 28.3	129 10 50.5	−5 6 20.1	+ 300.7	973.2	192.4
273	*a* Cancri, E.	1680,	10 7 5	. . .	128 52 5.1	129 25 4.0	−4 59 48.9	+ 853.5	940.8	. .
		Jan. 16	5 51 42.6	. . .	−4 30 4.9	129 10 50.5	−5 6 20.1	+ 391.2	935.9	. .
274	*a* Tauri, I.	1680,	15 0 53	. . .	64 54 25.7	65 3 44.4	−5 24 3.8	− 964.2	986.3	172.2
		Sept. 13	2 36 28.7	. . .	−4 46 29.7	65 19 48.6	−5 29 22.1	+ 318.3	1011.2	253.1
275	*a* Tauri, E.	1680,	16 9 12	. . .	65 35 10.8	65 34 37.4	−5 22 56.6	+ 888.8	986.8	. .
		Sept. 13	3 44 58.9	. . .	−4 48 6.0	65 19 48.6	−5 29 22.1	+ 385.5	965.1	. .
276	*a* Tauri, I.	1680,	7 50 43	. . .	64 33 16.0	65 2 37.8	−5 29 14.3	−1051.6	1008.9	226.3
		Nov. 7	23 1 58.6	. . .	−4 39 27.6	65 20 9.4	−5 29 23.2	+ 8.9	1046.8	198.8
277	*a* Tauri, E.	1680,	8 47 12	. . .	65 9 12.5	65 36 22.2	−5 27 36.5	+ 972.8	1011.2	. .
		Nov. 7	23 58 36.9	. . .	−4 40 47.7	65 20 9.4	−5 29 23.2	+ 106.7	974.8	. .
278	γ Tauri, I.	1682,	9 45 35	. . .	61 48 36.0	61 5 4.0	−5 49 6.8	− 979.8	957.7	354.8
		Mar. 14	9 16 54.8	. . .	−5 14 55.9	61 21 23.8	−5 46 4.3	− 182.5	991.7	66.6

Tabular Exhibit of Reduction of the Occultations—Concluded.

FLAMSTEED AT GREENWICH—Continued.

No.	Star occulted.	Date.	Local Mean and Sidereal Times.	Greenwich Mean Time.	Moon's Tabular Geocentric Position.	Apparent Position of Moon and Star.		$l'-L$ $b'-B$	S' D	⊙ $L-$⊙
						Longitudes.	Latitudes.			
			h m s	h m s	° ′ ″	° ′ ″	° ′ ″	″	″	°
279	γ Tauri, E. . .	1682,	10 41 15	. . .	62 20 28.8	61 35 0.3	−5 51 15.5	+876.5	955.7	354.8
		Mar. 14	10 12 43.9	. . .	−5 14 56.7	61 21 23.8	−5 46 4.3	−311.2	925.9	66.6
280	γ Tauri, I. . .	1683,	11 57 41	. . .	61 51 25.1	61 9 11.8	−5 36 41.8	−790.8	943.7	317.4
		Feb. 5	9 2 32.7	. . .	−5 3 33.0	61 22 22.1	−5 46 4.1	+562.3	967.1	104.0
281	γ Tauri, E. . .	1683,	12 47 43	. . .	62 19 7.1	61 35 28.5	−5 37 42.4	+786.4	942.3	. .
		Feb. 5	9 52 42.9	. . .	−5 2 46.4	61 22 22.1	−5 46 4.1	+501.7	929.6	. .
282	119 Tauri, I. . .	1683,	8 46 40	. . .	79 18 19.3	78 43 0.3	−4 38 22.9	−916.7	942.4	13.3
		Apr. 2	9 31 47.4	. . .	−4 3 42.6	78 58 17.0	−4 43 38.6	+315.7	966.6	65.7
283	119 Tauri, E. . .	1683,	9 27 54	. . .	79 40 58.4	79 3 26.6	−4 38 55.4	+909.6	941.2	. .
		Apr. 2	10 13 8.2	. . .	−4 2 29.5	78 58 17.0	−4 43 38.6	+283.2	949.8	. .
284	α Leonis, I. . .	1683,	9 55 24	. . .	145 25 17.6	145 14 4.0	+0 39 1.9	−707.2	981.8	44.6
		May 4	12 46 52.4	. . .	+1 24 1.1	145 25 51.2	+0 27 16.6	+705.3	998.7	100.8
285	α Leonis, E. . .	1683,	10 40 56	. . .	145 52 10.9	145 37 7.1	+0 38 26.0	+675.9	980.5	. .
		May 4	13 32 31.9	. . .	+1 26 17.7	145 25 51.2	+0 27 16.6	+669.4	951.3	. .
286	Jupiter, I. . .	1686,	9 33 33	. . .	. . .	. . .	. . .	. .	. .	21.4
		Apr. 10	. . .	. . .	. . .	. . .	. . .	. .	. .	. .
287	Jupiter, E. . .	1686,	10 32 38	. . .	. . .	. . .	. . .	. .	. .	. .
		Apr. 10	. . .	. . .	. . .	. . .	. . .	. .	. .	. .
288	Saturn . . .	1687,	13 30 37	. . .	. . .	. . .	. . .	. .	. .	8.4
		Mar. 28	. . .	. . .	. . .	. . .	. . .	. .	. .	. .

§ 13.

EQUATIONS OF CONDITION GIVEN BY THE PRECEDING OCCULTATIONS OF STARS.

We may consider it useless to attempt to determine from these older observations any elements of the moon's orbit which remain constant, and which, therefore, can be determined for any time from recent observations alone. Such are the moon's eccentricity, inclination, semi-diameter, and parallax. But it may be advisable to introduce the corrections of these last two elements into the equations, in order that when definitive modern values are obtained, the equations may be corrected accordingly. It is otherwise with the longitudes of the node and of the perigee, because the variations of these quantities have to be determined from observations, and the epoch of the observations now under consideration is so much more remote than that of the observations used by HANSEN, that we may expect them to give good results for the values of the variations in question. The most important element to be determined is the correction to the moon's mean longitude, and it is to this that our attention will be principally devoted.

The only elements which we shall attempt to determine at the present time are the corrections to the moon's mean longitude and longitude of the node, these being the only ones the admissible alterations in which can materially alter the conclusions to be drawn from the accounts of ancient eclipses. The correction to HANSEN's motion of the perigee is probably very small, and any value of it which could be deduced at present would be only provisional. We shall therefore present the equations of condition in such a form that they can be hereafter definitively resolved with improved data, when the latter are available.

Errors to which the equations are liable.—These may be divided into two classes; (α) those of pure observation, and (β) those of the elements of reduction.

(α) The errors of pure observation resolve themselves almost entirely into errors in the determination of the time, provided that the instantaneous immersion or emersion of the star is actually observed. In the case of immersions at the dark limb, this can not be a subject of doubt; but in the case of the other three classes of phenomena, more or less doubt or suspicion may exist, according to circumstances. In the case of the brighter stars, such as Aldebaran and Spica, and, indeed, from the year 1680 onward, in the case of all stars brighter than the fourth magnitude, no distinction of bright or dark limb need be made, because such stars can be readily seen at the bright limb with telescopes of moderate optical power. Observations of smaller stars at the bright limb are to be looked on with suspicion, and rejected entirely if there is no special reason to believe them accurate. All emersions are to be received with suspicion, owing to the doubt whether the observer saw the star at the moment of its reappearance. They should be retained only when there is reason to believe that the observer did not record as good an observation which failed in this way.

Besides these errors of observation, there may be a personal error of a fraction of a second in estimating the time, which will necessarily elude discussion, and which, therefore, need not be farther considered.

(β) The errors in the elements may be divided into three classes: (1) those of the lunar theory; (2) those arising from deviations of the moon from a spherical form; (3) those of the adopted position of the occulted star.

(1) In Part III of Papers published by the Transit of Venus Commission, periodic corrections to HANSEN's Theory are deduced, of which the mean value will somewhat exceed one second. Mr. NEISON has found a term produced by the action of Jupiter, which has a yet larger coefficient. Other terms, still unknown, may hereafter be discovered. Altogether, I think the probable error of HANSEN's Theory, leaving out terms of long period, may be estimated at $2''$.

(2) I am not aware of any investigation having for its object to determine the deviations of the moon from a spherical figure as affecting the time of an occultation. The probable magnitude of this deviation is, I think, less than $1''$.

(3) The probable errors in the computed positions of the occulted stars may be roughly estimated at $2''$ in the case of stars well observed by BRADLEY, and at a value still greater in the case of stars not so observed.

Leaving out errors of observation, I conceive that the minimum probable error of the computed value of the distance between the star and the centre of the moon (D) can hardly be less than $3''$ in the most favorable cases, and may be greater to any extent in unfavorable ones. When in the course of time the lunar theory is perfected, and the proper motions of the stars are better determined, this probable error may be considerably diminished.

Whenever there was any means of estimating the probable error of the time, that estimate is given in the following list of equations in the column $\pm\,\varepsilon$. Its effect is to be included in estimating the probable error. To enable this to be done, the change of D in one second of time is included in the equations of condition. The significations of the indeterminate quantities in the equations are as follows:—

$\delta\varepsilon$, the correction to HANSEN's mean longitude of the moon at the date.

δt, the correction to the observed time, should any be necessary.

$\delta\varpi$, the correction to the longitude of perigee.

$\delta\theta$, the correction to the longitude of node.

δb_0, the correction to the moon's latitude.

$\delta\Pi$, the correction to the moon's parallax.

The mode of computing the coefficients of these quantities has already been described in § 6, pages 55 to 68.

The absolute terms of the equations are the values of $D-S'$, formed from the proper column in the exhibit of reductions already given.

In column $\pm\,\varepsilon$ is given the supposed probable error of the observed times, or the probable order of magnitude of δt. In the observations of CASSINI, Series II, it may be assumed that the probable error is always about 2^s or 3^s.

The phase (immersion or emersion) and the limb (bright or dark) are indicated only in the unfavorable cases, blank signifying an immersion or a phenomenon at the dark limb, while E indicates an emersion, and B the bright limb.

After the time of HEVELIUS, the probable errors of the equations arise almost entirely from the uncertainties in the positions of the stars and the periodic inequalities of the moon, and are but slightly increased by the probable errors of the observed times. In the case of these observations, the last column shows the relative weights which have been assigned in the provisional solutions of the equations.

BULLIALDUS.

Number.	Equation.	$\pm\varepsilon$	Year.	Phase.	Limb.
	$''$	s			
2	$0 = -0.63\delta\varepsilon - 0.23\delta t - 79.1$	.	1635.0	.	.
3	$0 = -0.92 \quad -0.47 \quad +105.6$	.	1639.3	.	.
4	$0 = -0.80 \quad -0.44 \quad +10.7$	.	1641.3	.	.

GASSENDUS.

Number.	Equation.	$\pm\varepsilon$	Year.	Phase.	Limb.
5	$0 = -0.83\delta\varepsilon - 0.50\delta t + 34.6$	.	1627.5	.	.
6	$0 = -0.91 \quad -0.41 \quad +62.4$	.	1627.7	.	.
7	$0 = -0.59 \quad -0.21 \quad +17.5$	.	1632.1	.	.
8	$0 = +0.28 \quad +0.19 \quad +3.8$	.	"	E	B
*9	$0 = -0.79 \quad -0.27 \quad +156.0$	.	1635.7	.	.
10	$0 = +1.07 \quad -0.58 \quad +109.0$	.	1637.2	.	.
11	$0 = -0.83 \quad -0.42 \quad +57.4$	.	"	.	.
12	$0 = -0.62 \quad -0.39 \quad +41.8$	.	"	.	.
13	$0 = -1.02 \quad -0.60 \quad +86.8$	.	"	.	.
14	$0 = -0.98 \quad -0.38 \quad +47.0$	.	1638.1	.	.
15	$0 = -0.68 \quad -0.27 \quad +6.8$	.	"	.	.
16	$0 = -1.08 \quad -0.54 \quad -50.8$	.	1639.0	.	B

HEVELIUS.

Number.	Equation.	$\pm\varepsilon$	Year.	Phase.	Limb.
17	$0 = -1.07\delta\varepsilon - 0.47\delta t + 57.3$	35	1644.9	.	B
18	$0 = +1.04 \quad +0.48 \quad -39.6$	35	"	E	.
19	$0 = -1.10 \quad -0.47 \quad +17.5$	35	1645.8	.	B
20	$0 = +1.11 \quad +0.49 \quad -30.9$	35	"	E	.
22	$0 = -0.59 \quad -0.30 \quad +53.5$	25	1658.8	.	B
23	$0 = +0.92 \quad +0.38 \quad -25.0$	12	1660.3	E	.
24	$0 = -0.81 \quad -0.37 \quad +6\ 6$	20	1660.5	.	.
25	$0 = -0.83 \quad -0.45 \quad +38.1$	40	1663.2	.	.
26	$0 = -1.09 \quad -0.58 \quad +105.5$	25	"	.	.
27	$0 = -1.02 \quad -0.56 \quad +53.1$	25	"	.	.
28	$0 = -0.65 \quad -0.27 \quad +11.0$	12	1663.6	.	B
29	$0 = +0.66 \quad +0.26 \quad +3.2$	12	"	E	.

HEVELIUS—Continued.

Number.	Equation.	$\pm\varepsilon$	Year.	Phase.	Limb.
	$''$	s			
30	$0 = -1.03\delta\varepsilon - 0.54\delta t + 37.4$	18	1664.2	.	.
31	$0 = +0.97 \quad +0.57 \quad -15.4$	18	"	E	B
35	$0 = -0.86 \quad -0.34 \quad +29.3$	15	1671.3	.	.
36	$0 = +0.71 \quad +0.34 \quad -23.4$	15	"	E	B
37	$0 = -1.00 \quad -0.43 \quad +51.7$	30	1672.8	.	B
38	$0 = -1.14 \quad -0.48 \quad +48.8$	28	"	.	B
39	$0 = -1.00 \quad -0.41 \quad +53.9$	25	"	.	B
40	$0 = -0.69 \quad -0.36 \quad +11.2$	25	1673.2	.	.
41	$0 = -0.77 \quad -0.39 \quad +33.3$	25	"	.	.
42	$0 = -0.89 \quad -0.48 \quad +15.4$	25	"	.	.
43	$0 = -0.81 \quad -0.44 \quad +23.1$	25	"	.	.
44	$0 = -0.96 \quad -0.45 \quad +49.9$	25	1674.6	.	B
45	$0 = -0.27 \quad -0.18 \quad +25.3$	25	"	.	B
46	$0 = -0.78 \quad -0.35 \quad +40.8$	25	"	.	B
47	$0 = +0.37 \quad +0.11 \quad +3.9$	25	"	E	.
48	$0 = -0.18 \quad -0.13 \quad +12.8$	25	"	.	B
49	$0 = +0.90 \quad +0.42 \quad +34.1$	25	"	E	.
50	$0 = -0.91 \quad -0.38 \quad +26.2$	25	"	.	B
51	$0 = -0.36 \quad -0.11 \quad -7.7$	25	"	E	.
52	$0 = +0.55 \quad +0.27 \quad -14.8$	25	"	E	.
53	$0 = +0.79 \quad +0.36 \quad -23.1$	25	"	E	.
55	$0 = -0.57 \quad -0.24 \quad +10.0$	30	1675.0	.	.
57	$0 = +0.52 \quad +0.24 \quad -1.8$	30	"	E	.
58	$0 = -0.88 \quad -0.45 \quad +46.3$	18	1676.7	.	B
59	$0 = +0.90 \quad +0.41 \quad -18.8$	20	"	E	.
62	$0 = -0.88 \quad -0.40 \quad -25.4$	22	1678.2	.	.
63	$0 = -0.88 \quad -0.35 \quad +15.3$	22	1679.2	.	B
64	$0 = -0.91 \quad -0.36 \quad +12.1$	20	"	.	B
65	$0 = +0.86 \quad +0.36 \quad +4.8$	15	"	E	.
66	$0 = +0.89 \quad +0.38 \quad -24.4$	16	"	E	.
69	$0 = -0.56 \quad -0.24 \quad +19.4$	6?	1679.5	.	B
70	$0 = +0.55 \quad +0.22 \quad +11.3$	6?	"	E	.
71	$0 = -1.13 \quad -0.48 \quad +54.6$	20	1681.0	.	.
72	$0 = +1.09 \quad +0.47 \quad -1.5$	17	"	E	B
73	$0 = -1.05 \quad -0.44 \quad +57.4$	8	1683.0	.	.
74	$0 = +1.04 \quad +0.44 \quad -39.3$	8	"	E	B
75	$0 = -1.00 \quad -0.53 \quad +146.5$	25	1683.3	.	.
76	$0 = -0.96 \quad -0.54 \quad +98.1$	22	"	.	.
77	$0 = +0.95 \quad +0.56 \quad -59.6$	20	"	E	B

* The final revision of the observations for time indicate a value of $\delta t = +143^{\mathrm{s}}$.

CASSINI AND OTHERS.

Number.	Equation.							± ε	Year.	Phase.	Limb.	Wt.
							″	s				
78	$0 = -0.90\delta\varepsilon$	$-0.38\delta t$	$-1.93e\delta\varpi$	$0.00i\delta\theta$	$-0.01\delta b_0$	$+0.32\delta\Pi$	+ 23.1	6?	1672.6	.	.	$\frac{1}{2}$
80	0 = − 0.82	− 0.38	+ 0.91	+ 0.11	+ 0.68	− 0.83	+ 31.7	10?	1676.2	.	B	$\frac{1}{3}$
81	0 = + 0.97	+ 0.37	− 1.09	+ 0.08	+ 0.49	+ 0.13	− 36.6	10?	“	E	.	0
85	0 = − 0.72	− 0.40	+ 0.23	− 0.22	+ 0.71	+ 0.18	+ 19.5	2	1683.1	.	.	1
86	0 = − 0.32	− 0.18	− 0.45	+ 0.94	− 0.95	+ 0.37	+ 12.7	3	1685.0	.	.	1
87	0 = + 0.48	+ 0.16	+ 0.66	+ 0.86	− 0.87	+ 0.56	− 7.6	3?	“	E	.	1
88	0 = − 0.76	− 0.39	− 1.13	+ 0.09	− 0.56	+ 0.81	+ 19.5	5	1686.5	.	.	1
92	0 = − 1.05	− 0.59	+ 1.61	+ 0.15	− 0.35	− 0.13	+ 16.0	3?	1690.5	.	B	1

LA HIRE.

Number.	Equation.							± ε	Year.	Phase.	Limb.	Wt.
93	$0 = -1.07\delta\varepsilon$	$-0.42\delta t$	$+1.52e\delta\varpi$	$0.00i\delta\theta$	$-0.08\delta b_0$	$+0.28\delta\Pi$	+ 34.9	2	1682.1	.	.	1
94	0 = − 1.04	− 0.41	+ 1.47	0.00	+ 0.27	+ 0.10	+ 28.0	2	“	.	.	1
95	0 = − 0.32	− 0.18	− 0.45	+ 0.94	− 0.95	+ 0.37	+ 12.8	1	1685.0	.	.	1
96	0 = + 0.48	+ 0.16	+ 0.66	+ 0.86	− 0.87	+ 0.56	− 7.9	1	“	E	.	1
97	0 = − 0.90	− 0.50	− 2.00	− 0.08	+ 0.08	− 0.63	+ 21.4	2	1685.8	.	B	1
98	0 = − 0.60	− 0.36	+ 0.95	− 0.28	− 0.84	+ 0.33	+ 17.0	2	1699.6	.	B	1
99*	0 = + 0.73	+ 0.30	− 1.16	− 0.24	− 0.74	+ 0.85	− 19.0	2	“	E	.	1
100	0 = − 0.57	− 0.22	− 0.52	− 0.30	+ 0.81	− 0.14	+ 8.2	2	1701.7	.	B	1
101	0 = + 0.53	+ 0.21	+ 0.48	− 0.32	+ 0.84	− 0.79	− 11.4	2	“	E	.	0
104	0 = − 0.60	− 0.24	− 1.30	+ 0.76	+ 0.76	− 0.83	+ 3.2	2	1718.7	.	.	$\frac{1}{2}$

CASSINI, ETC.—SERIES II.

Number.	Equation.							± ε	Year.	Phase.	Limb.	Wt.
105	$0 = -0.75\delta\varepsilon$	$-0.40\delta t$	$+1.16e\delta\varpi$	$-0.21i\delta\theta$	$-0.76\delta b_0$	$+0.99\delta\Pi$	+ 22.9	.	1705.6	.	B	.
106	0 = − 0.95	− 0.43	+ 1.60	+ 0.07	− 0.59	+ 0.77	+ 23.3	.	1705.7	.	.	.
107	0 = + 1.01	+ 0.44	− 1.86	+ 0.04	− 0.34	− 0.23	− 20.3	.	“	E	B	.
108	0 = − 0.74	− 0.33	+ 0.82	− 0.68	+ 0.70	+ 0.19	− 40.0	.	1706.1	.	.	.
109	0 = − 0.83	− 0.31	− 0.52	+ 0.21	− 0.55	+ 0.31	+ 20.8	.	“	.	.	.
110	0 = − 0.77	− 0.27	− 0.97	− 0.08	− 0.58	+ 0.32	+ 21.8	.	1706.3	.	.	.

These six equations result from using CASSINI's correction to the quadrant, which is probably incorrect. In the following these equations are given as resulting from the new correction.

Number.	Equation.							± ε	Year.	Phase.	Limb.	Wt.
111	0 = − 0.75	− 0.40	+ 1.16	− 0.21	− 0.76	+ 0.99	+ 14.1	.	1705.6	.	B	1
112	0 = − 0.95	− 0.43	+ 1.60	+ 0.07	− 0.59	+ 0.77	+ 17.5	.	1705.7	.	.	1
113	0 = + 1.01	+ 0.44	− 1.86	+ 0.04	− 0.34	− 0.23	− 14.1	.	“	E	B	0
114	0 = − 0.74	− 0.33	+ 0.82	− 0.68	+ 0.70	+ 0.19	− 46.9	.	1706.1	.	.	0
115	0 = + 0.01	− 0.02	− 0.01	− 0.98	+ 1.01	− 0.39	− 12.7	.	“	.	.	0
116	0 = + 0.03	− 0.01	− 0.04	− 0.98	+ 1.01	− 0.41	− 13.1	.	“	.	.	0
117	0 = + 0.30	+ 0.11	− 0.33	− 0.94	+ 0.96	− 0.57	+ 15.6	.	“	E	B	0
118	0 = − 0.82	− 0.30	− 0.50	+ 0.21	− 0.55	+ 0.31	+ 16.4	.	“	.	.	1
119	0 = − 0.76	− 0.27	− 0.95	− 0.08	− 0.59	+ 0.32	+ 15.7	.	1706.3	.	.	1
120	0 = + 0.49	+ 0.28	+ 0.62	− 0.13	− 0.86	+ 0.46	− 9.7	.	“	E	B	0
121	0 = − 0.46	− 0.13	− 0.98	− 0.85	− 0.87	+ 0.62	+ 7.5	.	1706.4	.	.	1
122	0 = − 1.05	− 0.43	+ 1.81	− 0.41	+ 0.41	+ 0.39	+ 17.2	.	1706.9	.	.	1
123	0 = − 1.05	− 0.56	+ 1.84	+ 0.36	− 0.38	+ 0.99	+ 9.9	.	1707.3	.	.	1

* Cassini's record is 10^s earlier than LA HIRE'S. I have supposed $\delta t = -7^s$ in solving this equation.

CASSINI, ETC.—SERIES II—Continued.

Number.	Equation.							Year.	Phase.	Limb.	Wt.
							″				
124	0 = − 0.52 $\delta\varepsilon$	− 0.21 δt	− 1.16 $e\delta\varpi$	− 0.56 $i\delta\theta$	− 0.82 δb_0	+ 0.89 $\delta\Pi$	+ 15.7	1707.7	.	.	¼
125	0 = + 0.56	+ 0.23	+ 1.24	− 0.53	− 0.78	+ 0.59	− 6.8	“	E	B	1
126	0 = − 0.94	− 0.50	+ 0.26	+ 0.38	− 0.38	+ 0.99	+ 13.7	1708.1	.	.	1
127	0 = − 0.93	− 0.50	+ 0.25	+ 0.38	− 0.38	+ 1.00	+ 7.4	“	.	.	
128	0 = + 1.01	+ 0.61	− 1.44	+ 0.12	− 0.27	+ 0.65	+ 84.1	1708.7	E	.	0
129	0 = − 0.83	− 0.39	+ 1.34	+ 0.66	+ 0.66	− 0.74	+ 17.2	1709.3	.	.	1
130	0 = − 0.59	− 0.30	− 1.32	+ 0.75	− 0.76	+ 0.57	+177.2	1709.7	.	.	0
131	0 = − 0.86	− 0.54	− 0.03	+ 0.11	− 0.46	+ 0.05	+ 7.8	“	.	B	½
132	0 = − 0.30	− 0.22	− 0.01	+ 0.23	− 0.95	+ 0.71	+ 10.6	“	.	B	½
133	0 = − 0.36	− 0.26	− 0.01	+ 0.22	− 0.93	+ 0.65	+ 17.8	“	.	B	½
134	0 = + 0.50	+ 0.25	+ 0.01	+ 0.21	− 0.86	+ 0.96	− 4.0	“	E	.	0
135	0 = + 0.93	+ 0.52	+ 0.02	+ 0.07	− 0.29	+ 0.68	− 1.3	“	E	.	0
136	0 = − 0.91	− 0.50	− 1.56	+ 0.03	+ 0.23	− 0.65	+ 10.4	1710.9	.	.	1
137	0 = − 0.40	− 0.26	− 0.67	− 0.14	− 0.91	+ 0.47	+ 13.0	“	.	.	1
138	0 = − 0.05	− 0.08	− 0.08	− 0.16	− 1.00	− 0.77	+ 10.2	“	.	.	1
139	0 = + 0.32	+ 0.11	+ 0.55	− 0.15	− 0.94	+ 0.83	+ 12.1	“	E	B	0
140	0 = + 0.92	+ 0.44	+ 1.56	− 0.03	− 0.17	+ 0.56	+ 13.9	“	E	B	0
141	0 = − 0.79	− 0.31	− 1.76	− 0.21	− 0.50	+ 0.39	+ 17.5	1711.7	.	B	½
142	0 = − 0.20	− 0.09	− 0.44	− 0.42	− 0.99	+ 0.44	+ 12.6	“	.	B	½
143	0 = − 0.48	− 0.18	− 1.06	+ 0.38	+ 0.86	− 0.11	+ 8.1	“	.	B	½
144	0 = + 0.81	+ 0.32	+ 1.80	− 0.20	− 0.46	− 0.20	+ 7.8	“	E	.	0
145	0 = + 0.48	+ 0.19	+ 1.08	+ 0.38	+ 0.85	− 0.60	− 6.3	“	E	.	0
146	0 = − 0.56	− 0.30	+ 0.13	+ 0.39	+ 0.84	− 0.68	+ 11.8	1712.4	.	.	1
147	0 = + 0.66	+ 0.28	− 0.17	+ 0.35	+ 0.77	− 0.85	− 4.1	“	E	B	0
148	0 = − 0.93	− 0.50	− 0.26	+ 0.31	+ 0.32	+ 0.41	+ 12.1	1714.2	.	.	1
149	0 = − 0.98	− 0.40	+ 1.16	+ 0.26	− 0.30	+ 0.06	+ 18.0	1714.3	.	B	1
150	0 = + 0.98	+ 0.39	− 1.17	+ 0.28	− 0.32	+ 0.34	− 14.9	“	E	.	1
151	0 = − 0.87	− 0.33	+ 1.56	+ 0.48	+ 0.60	− 0.46	+ 13.9	1715.6	.	B	1
152	0 = + 0.67	+ 0.32	− 1.19	+ 0.65	+ 0.80	− 0.60	+ 4.2	“	E	.	0
157	0 = − 0.56	− 0.27	+ 0.64	− 0.30	− 0.86	+ 0.77	+ 7.6	“	.	B	1
158	0 = + 0.77	+ 0.27	− 0.89	− 0.25	− 0.72	+ 0.38	− 1.6	“	E	.	0
159	0 = − 0.89	− 0.39	+ 0.89	− 0.23	− 0.58	+ 0.55	+ 4.6	1715.8	.	.	1
160	0 = − 0.92	− 0.45	+ 0.73	− 0.19	− 0.42	+ 0.93	+ 11.4	1716.0	.	.	1
161	0 = − 1.04	− 0.61	+ 1.34	+ 0.04	+ 0.08	− 0.60	+ 17.2	1717.7	.	B	1
162	0 = + 1.02	+ 0.59	− 1.32	+ 0.10	+ 0.22	+ 0.37	− 13.4	“	E	.	1
163	0 = − 0.60	− 0.24	− 1.30	+ 0.76	+ 0.76	− 0.83	+ 5.4	1718.7	.	.	½
164	0 = − 0.84	− 0.41	− 0.60	+ 0.02	− 0.49	+ 0.95	+ 8.7	1719.3	.	.	1
165	0 = + 0.73	+ 0.44	+ 0.52	+ 0.03	− 0.64	− 0.22	− 7.8	“	E	B	1
166	0 = + 0.85	+ 0.38	+ 1.26	+ 0.08	− 0.41	+ 0.69	− 4.4	1719.8	E	.	0
167	0 = − 0.80	− 0.37	− 1.36	− 0.08	+ 0.52	− 0.80	+ 8.1	1719.9	.	.	1
168	0 = − 0.33	− 0.19	+ 0.49	− 0.60	+ 0.97	− 0.76	− 2.2	1720.3	.	.	0
169	0 = + 0.54	+ 0.19	− 0.80	− 0.55	+ 0.89	− 0.78	− 7.6	“	E	B	0
170	0 = − 0.93	− 0.38	− 0.39	− 0.12	+ 0.26	− 0.37	+ 10.5	1727.7	.	B	½
171	0 = − 0.89	− 0.41	− 0.37	+ 0.18	− 0.39	+ 0.01	+ 16.4	“	.	B	½
172	0 = − 0.57	− 0.29	− 0.23	+ 0.36	− 0.82	+ 0.35	+ 9.2	“	.	B	½
173	0 = − 0.93	− 0.40	− 0.37	+ 0.13	− 0.29	0.00	+ 12.2	“	.	B	½

CASSINI, ETC.—SERIES II—Continued.

Number.	Equation.	Year.	Phase.	Limb.	Wt.
	$''$				
174	$0 = +0.79\delta\varepsilon + 0.35\delta t + 0.31e\delta\omega - 0.26i\delta\theta + 0.58\delta b_0 - 0.20\delta\Pi - 9.0$	1727.7	E	.	0
175	$0 = +0.97 \quad +0.38 \quad +0.38 \quad +0.03 \quad -0.07 \quad +0.09 \quad -39.7$	"	E	.	0
176	$0 = +0.79 \quad +0.28 \quad +0.30 \quad +0.26 \quad -0.59 \quad +0.28 \quad -3.7$	"	E	.	0
177	$0 = +0.97 \quad +0.38 \quad +0.37 \quad -0.01 \quad +0.03 \quad -0.06 \quad -9.6$	"	E	.	0
178	$0 = -0.88 \quad -0.34 \quad -1.70 \quad +0.02 \quad -0.34 \quad +0.30 \quad +3.7$	1738.0	.	.	1
179	$0 = +0.90 \quad +0.35 \quad +1.76 \quad +0.02 \quad -0.25 \quad -0.22 \quad -4.7$	"	E	B	½
180	$0 = -0.85 \quad -0.40 \quad -1.78 \quad -0.13 \quad +0.36 \quad -0.72 \quad -0.3$	1739.0	.	.	1
181	$0 = +0.75 \quad +0.38 \quad +1.57 \quad -0.22 \quad +0.58 \quad -0.07 \quad -2.1$	"	E	B	½

DELISLE AT LUXEMBOURG.

183	$0 = -0.61\delta\varepsilon - 0.24\delta t - 0.20e\delta\varpi - 0.78i\delta\theta - 0.80\delta b_0 + 0.40\delta\Pi + 7.8$	1713.9	.	.	1
184	$0 = -0.66 \quad -0.37 \quad +0.14 \quad +0.76 \quad +0.76 \quad +0.02 \quad +6.1$	1714.2	.	.	1
185	$0 = -0.93 \quad -0.50 \quad -0.26 \quad +0.31 \quad +0.32 \quad +0.41 \quad +12.3$	"	.	.	1
186	$0 = -0.98 \quad -0.40 \quad +1.16 \quad +0.26 \quad -0.30 \quad +0.06 \quad +18.0$	1714.3	.	B	1
187	$0 = +0.98 \quad +0.38 \quad -1.17 \quad +0.28 \quad -0.32 \quad +0.34 \quad -14.9$	"	E	.	1
188	$0 = +0.98 \quad +0.54 \quad -0.93 \quad -0.39 \quad -0.39 \quad +0.84 \quad -12.9$	1714.7	E	.	1
189	$0 = +0.84 \quad +0.40 \quad +1.11 \quad -0.16 \quad -0.42 \quad +0.95 \quad -6.1$	1714.8	E	.	1
190	$0 = -1.04 \quad -0.61 \quad +1.34 \quad +0.04 \quad +0.08 \quad -0.60 \quad +13.5$	1717.7	.	B	1
191	$0 = +1.02 \quad +0.59 \quad -1.32 \quad +0.10 \quad +0.22 \quad +0.37 \quad -10.0$	"	E	.	1
192	$0 = -0.57 \quad -0.29 \quad +0.91 \quad -0.25 \quad +0.87 \quad -0.35 \quad +13.9$	1718.0	.	.	1
193	$0 = -1.03 \quad -0.40 \quad +0.94 \quad +0.07 \quad +0.19 \quad -0.10 \quad +15.3$	1718.1	.	.	1
194	$0 = -0.60 \quad -0.24 \quad -0.16 \quad +0.76 \quad +0.76 \quad -0.83 \quad +5.4$	1718.7	.	.	½
195	$0 = -0.84 \quad -0.41 \quad -0.60 \quad +0.02 \quad -0.49 \quad +0.95 \quad +9.9$	1719.3	.	.	1
196	$0 = +0.73 \quad +0.44 \quad +0.52 \quad +0.03 \quad -0.64 \quad -0.22 \quad -3.2$	"	E	B	0
197	$0 = -1.04 \quad -0.44 \quad +1.64 \quad +0.03 \quad -0.26 \quad +0.39 \quad +10.1$	1719.6	.	.	1
198	$0 = -0.75 \quad -0.42 \quad -1.12 \quad +0.12 \quad -0.60 \quad +0.06 \quad -1.3$	1719.8	.	B	1
199	$0 = +0.85 \quad +0.38 \quad +1.26 \quad +0.08 \quad -0.41 \quad +0.69 \quad +2.4$	"	E	.	0
200	$0 = -1.06 \quad -0.58 \quad +1.98 \quad +0.16 \quad -0.17 \quad +0.92 \quad +13.0$	1725.1	.	.	1

DELISLE AT ST. PETERSBURG.

201	$0 = -0.99\delta\varepsilon - 0.47\delta t + 0.31e\delta\varpi + 0.01i\delta\theta - 0.02\delta b_0 + 0.65\delta\Pi + 4.7$	1727.2	.	.	.
202	$0 = -0.88 \quad -0.48 \quad -1.84 \quad +0.07 \quad +0.23 \quad +0.50 \quad +3.6$	1729.9	.	.	.
203	$0 = -0.78 \quad -0.40 \quad -1.63 \quad -0.15 \quad -0.51 \quad +0.91 \quad +1.0$	"	.	.	.
204	$0 = -0.60 \quad -0.35 \quad -1.26 \quad -0.23 \quad -0.75 \quad +0.96 \quad +2.4$	"	.	.	.
205	$0 = -0.25 \quad -0.18 \quad -0.53 \quad +0.29 \quad +0.96 \quad -0.50 \quad -1.0$	"	.	.	.
206	$0 = -0.79 \quad -0.47 \quad -1.66 \quad +0.15 \quad +0.48 \quad +0.22 \quad +3.5$	"	.	.	.
207	$0 = -0.78 \quad -0.49 \quad -1.64 \quad +0.16 \quad +0.50 \quad +0.16 \quad +2.8$	"	.	.	.
208	$0 = -0.53 \quad -0.36 \quad -1.11 \quad +0.25 \quad +0.81 \quad -0.26 \quad +0.7$	"	.	.	.
209	$0 = -1.00 \quad -0.43 \quad +1.01 \quad -0.23 \quad -0.26 \quad +0.27 \quad +16.5$	1733.2	.	.	.
210	$0 = -0.49 \quad -0.23 \quad -0.13 \quad +0.34 \quad +0.88 \quad -0.76 \quad -14.6$	"	.	.	.
211	$0 = -0.79 \quad -0.50 \quad +0.27 \quad +0.30 \quad +0.61 \quad -0.05 \quad +7.2$	1736.3	.	.	.
212	$0 = -1.00 \quad -0.42 \quad -0.10 \quad +0.64 \quad +0.16 \quad -0.63 \quad +6.7$	1736.6	.	B	.
213	$0 = +0.98 \quad +0.42 \quad +0.08 \quad +0.11 \quad +0.27 \quad -0.25 \quad +4.7$	"	E	.	.
214	$0 = -0.97 \quad -0.41 \quad -0.43 \quad -0.01 \quad -0.21 \quad +0.19 \quad +5.3$	1736.8	.	B	.

DELISLE AT ST. PETERSBURG—Continued.

Number.	Equation.							Year.	Phase.	Limb.	Wt.
							″				
215	0 = + 0.97 $\delta\varepsilon$	+ 0.42 δt	+ 0.40 $e\delta\varpi$	0.00 $i\delta\theta$	0.00 δb_0	− 0.32 $\delta\Pi$	+ 4.3	1736.8	E	.	.
216	0 = − 1.02	− 0.49	+ 1.18	+ 0.19	− 0.22	+ 0.39	+ 8.6	1737.4	.	.	.
219	0 = + 0.41	+ 0.20	+ 0.64	− 0.11	− 0.90	+ 0.98	− 9.2	1737.6	E	.	.
220	0 = + 0.82	+ 0.45	+ 1.26	− 0.06	− 0.49	+ 0.76	− 3.2	"	E	.	.
221	0 = − 0.54	− 0.22	+ 1.17	− 0.01	+ 0.82	− 0.77	− 1.9	1738.0	.	.	.
222	0 = − 0.93	− 0.41	− 1.85	0.00	− 0.04	− 0.08	+ 5.2	"	.	.	.
223	0 = − 0.86	− 0.37	− 1.74	− 0.01	+ 0.35	− 0.35	+ 3.2	"	.	.	.
224	0 = − 0.82	− 0.36	− 1.18	+ 0.02	− 0.48	+ 0.38	+ 7.1	"	.	.	.
225	0 = − 0.54	− 0.23	− 1.05	+ 0.06	− 0.82	+ 0.81	+ 4.4	"	.	.	.
226	0 = + 0.50	+ 0.25	+ 0.97	+ 0.07	− 0.85	+ 0.28	− 1.2	"	E	B	.
227	0 = − 0.50	− 0.24	− 0.37	+ 0.07	− 0.87	+ 0.42	+ 4.4	1738.1	.	.	.
228	0 = − 0.78	− 0.36	− 1.73	− 0.11	+ 0.52	− 0.66	+ 1.9	1738.6	.	B	.
229	0 = + 0.69	+ 0.35	+ 1.52	− 0.15	+ 0.66	− 0.37	+ 0.5	"	E	.	.
230	0 = − 0.88	− 0.41	− 1.95	+ 0.06	− 0.26	+ 0.04	+ 10.9	"	.	B	.
231	0 = − 0.91	− 0.42	− 2.00	− 0.03	+ 0.12	− 0.11	− 5.4	"	.	B	.
232	0 = − 0.58	− 0.25	− 1.29	+ 0.21	− 0.78	+ 0.75	+ 1.1	"	.	B	.
233	0 = + 0.61	+ 0.29	+ 1.35	+ 0.21	− 0.75	+ 0.16	+ 38.8	"	E	.	.
234	0 = − 0.74	− 0.38	− 1.61	+ 0.18	− 0.59	+ 0.28	− 1.4	1738.8	.	B	.
235	0 = + 0.82	+ 0.35	+ 1.80	+ 0.14	− 0.43	+ 0.49	+ 2.7	"	E	.	.
236	0 = − 0.88	− 0.43	− 1.96	+ 0.22	− 0.22	− 0.32	+ 3.0	1739.8	.	B	.
237	0 = + 0.90	+ 0.40	+ 2.00	+ 0.10	− 0.10	+ 0.44	0.0	"	E	.	.
238	0 = − 0.90	− 0.46	− 1.99	+ 0.05	− 0.05	− 0.56	− 1.7	"	.	B	.
239	0 = + 0.90	+ 0.43	+ 1.98	− 0.07	+ 0.07	+ 0.50	+ 2.8	"	E	.	.
240	0 = − 0.91	− 0.46	− 1.48	+ 0.03	− 0.07	+ 0.73	+ 1.7	1746.2	.	.	.
241	0 = − 0.53	− 0.25	− 0.85	+ 0.37	− 0.82	+ 0.87	+ 0.6	"	.	.	.
242	0 = − 0.56	− 0.33	− 0.91	− 0.35	+ 0.79	− 0.05	− 1.8	"	.	.	.
243	0 = − 0.87	− 0.48	− 1.39	− 0.14	+ 0.31	+ 0.48	− 0.8	"	.	.	.
244	0 = − 0.85	− 0.47	− 1.36	− 0.16	+ 0.37	+ 0.42	+ 1.3	"	.	.	.
245	0 = − 0.80	− 0.47	− 1.26	− 0.21	+ 0.49	+ 0.28	− 1.3	"	.	.	.
246	0 = − 0.90	− 0.48	− 1.45	+ 0.08	− 0.18	+ 0.80	+ 0.7	"	.	.	.
247	0 = − 0.90	− 0.47	− 1.45	+ 0.07	− 0.15	+ 0.79	+ 0.2	"	.	.	.
248	0 = − 0.45	− 0.20	− 0.71	+ 0.39	− 0.88	+ 0.88	+ 0.8	"	.	.	.
249	0 = − 0.84	− 0.44	− 1.36	+ 0.17	− 0.39	+ 0.89	+ 1.1	"	.	.	.
250	0 = − 0.89	− 0.49	− 1.41	− 0.11	+ 0.25	+ 0.53	+ 0.6	"	.	.	.
251	0 = − 0.89	− 0.49	− 1.42	− 0.10	+ 0.22	+ 0.55	+ 2.2	"	.	.	.
252	0 = − 0.82	− 0.44	− 1.30	+ 0.19	− 0.44	+ 0.93	− 0.7	"	.	.	.
253	0 = − 0.46	− 0.27	− 1.01	− 0.16	+ 0.87	− 1.18	+ 0.2	1747.1	.	.	.
254	0 = − 0.88	− 0.46	− 1.94	− 0.05	+ 0.25	+ 0.51	0.0	"	.	.	.
255	0 = − 0.91	− 0.48	− 2.00	0.00	0.00	+ 0.69	+ 3.2	"	.	.	.
256	0 = − 0.64	− 0.37	− 1.41	− 0.13	− 0.71	+ 0.04	+ 2.9	"	.	.	.
257	0 = − 0.90	− 0.48	− 1.98	− 0.23	+ 0.12	+ 0.75	+ 0.8	"	.	.	.
258	0 = + 0.90	+ 0.49	+ 1.89	0.00	− 0.14	+ 0.42	0.0	1747.6	E	.	.
259	0 = + 0.79	+ 0.46	+ 1.67	− 0.01	+ 0.49	− 0.16	+ 0.3	"	E	.	.
260	0 = + 0.82	+ 0.47	+ 1.73	− 0.01	+ 0.42	− 0.09	− 0.2	"	E	.	.

FLAMSTEED.

Number.	Equation.							Year.	Phase.	Limb.	Wt.
							″				
261	$0 = -0.80\delta\varepsilon$	$-0.36\delta t$	$-1.78e\delta\varpi$	$-0.36i\delta\theta$	$-0.47\delta b_0$	$+0.84\delta\Pi$	+ 31.2	1676.2	.	.	1
262	0 = − 0.71	− 0.36	− 0.57	− 0.62	− 0.67	+ 0.90	+ 28.3	"	.	.	1
263	0 = + 1.01	+ 0.49	− 0.05	+ 0.03	− 0.09	+ 0.29	+ 9.5	1676.5	E	.	0
264	0 = − 0.93	− 0.38	+ 1.48	+ 0.48	− 0.52	+ 0.55	+103.6	1676.6	.	.	0
265	0 = − 0.81	− 0.47	− 1.77	− 0.43	− 0.43	− 0.25	− 40.4	1676.7	.	B	0
266	0 = + 0.89	+ 0.44	+ 1.94	− 0.19	− 0.18	+ 0.72	+ 26.4	"	E	.	0
267	0 = − 0.98	− 0.39	+ 1.62	− 0.42	+ 0.47	+ 0.03	+ 34.5	1676.8	.	.	1
269	0 = − 1.01	− 0.39	+ 1.41	− 0.14	+ 0.34	− 0.13	+ 28.0	1678.7	.	.	1
272	0 = − 0.95	− 0.43	− 0.25	− 0.15	+ 0.34	− 0.80	+ 33.9	1680.0	.	B	1
273	0 = + 0.93	+ 0.41	+ 0.27	− 0.17	+ 0.38	+ 0.33	− 4.9	"	E	.	0
274	0 = − 1.05	− 0.43	+ 1.90	+ 0.12	+ 0.28	− 0.35	+ 24.9	1680.7	.	B	1
275	0 = + 0.99	+ 0.41	− 1.78	+ 0.18	+ 0.44	− 0.24	− 21.7	"	E	.	1
276	0 = − 1.17	− 0.61	+ 2.00	− 0.01	− 0.03	− 0.49	+ 37.9	1680.9	.	B	1
277	0 = + 1.16	+ 0.58	− 1.99	+ 0.05	+ 0.14	+ 0.36	− 36.4	"	E	.	1
278	0 = − 1.03	− 0.52	+ 1.38	+ 0.01	− 0.19	+ 0.84	+ 34.0	1682.2	.	.	1
279	0 = + 0.98	+ 0.56	+ 1.33	0.00	− 0.34	− 0.51	− 29.8	"	E	B	0
280	0 = − 0.81	− 0.43	+ 0.26	− 0.18	+ 0.61	+ 0.26	+ 23.4	1683.1	.	.	1
281	0 = + 0.87	+ 0.43	− 0.29	− 0.13	+ 0.52	− 0.97	− 12.7	"	E	B	0
282	0 = − 0.93	− 0.46	+ 0.65	− 0.23	+ 0.38	+ 0.39	+ 24.2	1683.3	.	.	1
283	0 = + 0.98	+ 0.48	− 0.69	− 0.15	+ 0.25	− 0.82	+ 8.6	"	E	B	0
284	0 = − 0.70	− 0.36	+ 1.28	− 0.74	+ 0.77	− 0.40	+ 16.9	"	.	.	1
285	0 = + 0.83	+ 0.36	− 1.52	− 0.62	+ 0.64	− 0.75	− 29.2	"	E	B	0

PROVISIONAL SOLUTION OF THE PRECEDING EQUATIONS.

Observations of BULLIALDUS *and* GASSENDUS.

The only quantity which can be obtained from these observations is a rough mean correction to the moon's mean longitude. All the observations used were immersions at the dark limb, except in the case of the comparatively bright star μ Geminorum, of which the immersion was observed when the moon was full. The principal error to be feared is therefore in the determination of the time, which was derived by observing an altitude at the moment of the phenomenon. The probable error of each equation will be nearly proportional to $\frac{dD}{dt}$, and this, again, is nearly proportional to the coefficient of $\delta\varepsilon$. Hence, if we derive separate values of $\delta\varepsilon$ from each equation, the results will be entitled to nearly equal weight, supposing the times determined with equal precision. In combining the observations, however, I have, for an obvious reason, given only half weight when the object whose altitude was observed was less than two hours from the meridian, and also to the confused observation of γ Capricorni, on 1635, August 26. I have also given only weight $\frac{1}{3}$ to each of the three observations by BULLIALDUS which were not hopelessly erroneous. Observations at the bright limb are passed over without remark. The last observation is rejected entirely on account of discordance, and doubt respecting place of observation.

The separate results thus obtained are:—

1635.0	$\delta\varepsilon = -125''$	Wt. $= \frac{1}{3}$
39.3	$+114$	$\frac{1}{3}$
41.3	$+13$	$\frac{1}{3}$
1627.5	$\delta\varepsilon = +41''$	Wt. $= 1$
27.7	$+69$	$\frac{1}{2}$
32.1	$+29$	$\frac{1}{2}$
35.7	$+148$	$\frac{1}{2}$
37.2	$+102$	1
37.2	$+69$	1
37.2	$+68$	1
37.2	$+85$	1
38.1	$+48$	1
38.1	$+10$	1

The mean result is:—

$$\text{Epoch, } 1635.7: \ \delta\varepsilon = +57'' \pm 9''; \ \delta\varepsilon' = +3.8''.$$

The quantity $\delta\varepsilon'$ here represents the mean correction when HANSEN'S empirical term is removed.

Observations of HEVELIUS.

The treatment of the immersions observed by HEVELIUS does not offer any serious difficulty; but the frequency of cases in which it is clear from the result that the emersion was observed too late renders the use of the emersions doubtful. We shall divide the observations into groups, so as to obtain corrections for various mean epochs.

Group, 1644–1645.—The two occultations of α Tauri give very satisfactorily:—

$$\text{Epoch, 1645.2: } \delta\varepsilon = +33''.6\,;\ \delta\varepsilon' = +12'' \pm 8''.$$

Group, 1658–64.—The emersion of β Scorpii, 1660, April 26, HEVELIUS considered well observed, and the result seems good. The other two emersions I reject. The result thus obtained is:—

$$\text{Epoch, 1662.0: } \delta\varepsilon = +38'' \pm 4''\,;\ \delta\varepsilon' = +18''.$$

Group, 1671–75.—The immersions are all used, although the occultations of the Pleiades on 1674, August 23, were observed at the bright limb. I judge from the observations and other considerations that HEVELIUS could follow the stars of the Pleiades close up to the limb of the moon. The emersions are all rejected. The results are:—

$$\text{Epoch, 1673.9: } \delta\varepsilon = +39''.2 \pm 3''.4\,;\ \delta\varepsilon' = +22''.$$

Group, 1676–83.—Here, although HEVELIUS's clock-error seemed better determined than before, the observations exhibit anomalies which cannot be attributed to the apparent accidental errors of observation, and which, therefore, leave one in doubt how the results should be treated. As the results cannot be worth a refined discussion, I shall simply state how I have used the equations. The emersions of Mars and of α Tauri have been retained, while, as before, all other emersions are rejected. The results from χ Orionis, 1678, March 28, (No. 62), and from the three stars occulted 1683, April 2, (Nos. 75–77), have been rejected on account of discordance of results. In the first case, the identity of the star is still in doubt, while in the second there was an interval of nearly two hours between the first occultation and the determination of clock-error, during which interval the error had to be supposed constant. The results of the occultations seem to indicate a large clock-rate. There remain nine equations, of which the sum has been taken as a normal for determining $\delta\varepsilon$. This equation is:—

$$8.44\ \delta\varepsilon = 264'' \pm 40''\,;$$

and the result is:—

$$\text{Epoch, 1680.0: } \delta\varepsilon = +31'' \pm 5''\,;\ \delta\varepsilon' = +16''.$$

The close agreement of the four mean results derived from the observations of HEVELIUS is purely accidental; the discordance of the individual equations in general indicates that the probable errors we have assigned may be safely increased by one third.

Observations of the French astronomers and of FLAMSTEED.

A preliminary examination of these observations indicated that there was no systematic difference between the results of the occultations observed by FLAMSTEED and those observed by the French astronomers. They have therefore been combined, and solved so as to obtain corrections to the moon's mean longitude and to the longitude of the node. In effecting these solutions, we meet with the difficulty that the correction to the tabular mean longitude cannot be regarded as increasing uniformly for any considerable length of time. On the other hand, when we divide the observations into groups, the duration of each group is too small to permit an accurate determination of the correction of mean motion from that group alone. The following course appeared best adapted for the present preliminary solution. Rough solutions were first made so as to give the value of $\delta\varepsilon$ alone for the mean epochs of the great groups into which the observations were divided. Thus was found:—

For 1680, $\delta\varepsilon = +30''.4$, FLAMSTEED'S observations.
For 1682, $\delta\varepsilon = +28''.5$, Paris observations.
For 1710, $\delta\varepsilon = +15''.4$, Paris observations.
For 1715, $\delta\varepsilon = +13''.8$, DELISLE'S observations.
For 1728.5, $\delta\varepsilon = +7''.3$, Paris and DELISLE'S observations.

From these values of the correction of mean longitude, it was concluded that the corrections to the tabular mean motion might be assumed to have the following values:—

From 1672 to 1690, $\delta n = -0''.35$.
From 1699 to 1720, $\delta n = -0''.55$.

With these assumed annual changes, each residual of an equation was reduced to a mean epoch of its group, all the observations to 1720 being divided into two groups. The adopted mean epoch for the first period, 1672 to 1690, was 1680.0; that for the second, 1699–1720, was 1712.5. In other words, the absolute term of each equation was corrected by the quantity $0''.35\ k\ (1680.0 - t)$ for the first group, and by the quantity $0.''55\ k\ (1712.5 - t)$ for the second, k being the coefficient of $\delta\varepsilon$ in the equation.

In the solution, the unknown quantities retained were $\delta\varepsilon$, $i\delta\theta$, and δb_0, the last being an assumed constant correction to the moon's latitude. This was kept in the equations, because a constant error in the declinations, and therefore in the latitudes of the stars, is to be expected, and will show itself in the equations as a constant apparent correction to the moon's latitude.

The weights assigned to the several equations are shown in the last column. The probable error depends mainly upon the errors of theory and of the place of the star, so that no distinction with respect to weight was necessary in the case of fair observations. As a general rule, emersions were rejected unless there was positive reason to believe that the reappearance of the star had actually been caught at the right moment. The solutions with the assigned weights lead to the following results:—

First group, CASSINI, FLAMSTEED, LA HIRE, 1672–1690.

Normal Equations.

$$\begin{array}{rrrrl}
18.423\,\delta\varepsilon & +\,2.613\ i\delta\theta & -\,1.521\ \delta b_0 & -\,538''.27 & = 0 \\
2.613 & +\,4.750 & -\,3.940 & -\,66''.84 & = 0 \\
-\,1.521 & -\,3.940 & +\,7.059 & +\,25''.59 & = 0.
\end{array}$$

Solution.

$$\begin{aligned}\delta\varepsilon &= +29''.41, \text{ epoch } 1680.0.\\ i\delta\theta &= +\ 0''.26.\\ \delta b_0 &= +\ 2''.86, \text{ weight} = 3.8.\end{aligned}$$

Second group, CASSINI, LA HIRE, DELISLE, 1699–1720.

Normal Equations.

$$\begin{array}{rrrrl} 31.65\ \delta\varepsilon & -2.321\ i\delta\theta & +\ 0.753\ \delta b_0 & -466''.84 & =0\\ -2.321 & +5.970 & +\ 4.876 & +\ 25''.84 & =0\\ 0.753 & +4.876 & +17.63 & -\ 29''.31 & =0. \end{array}$$

Solution.

$$\begin{aligned}\delta\varepsilon &= +14''.78, \text{ epoch } 1712.5.\\ i\delta\theta &= +\ 0''.75.\\ \delta b_0 &= +\ 0''.82, \text{ weight} = 13.4.\end{aligned}$$

The corrections $i\delta\theta$ have a very small weight in both equations. Occultations do not afford good data for determining the correction to the moon's node, because, to be favorable, an observation must be not too far from the node, and must not be nearly central. A glance at the equations will show that the coefficient of $i\delta\theta$ amounts to 0.5 in less than half the equations. Moreover, owing to an accidental lack of symmetry in the occultations in each group, the value of $i\delta\theta$ depends very largely on that of δb_0, the approximate expressions being:—

From the first group, $i\delta\theta = \ 1''.47 - 0.85\ \delta b_0$.
From the second group, $i\delta\theta = -2''.19 + 0.85\ \delta b_0$.

The actual value of δb_0 and $i\delta\theta$ should be considered nearly the same for both groups, being probably about one-fifth larger for the first group than for the second, since we may suppose them to vanish about 1850. The most probable values of δb_0, on this hypothesis, are:—

For the first group, $\delta b_0 = +1''.5$.
For the second, $\delta b_0 = +1''.2$.

Whence we shall obtain—

From the first group, $i\delta\theta = +0''.2$.
From the second group, $i\delta\theta = -1''.2$.

To obtain a really definitive result, we must combine both groups, supposing the values of $\delta\varepsilon$ independent, and putting—

$$\begin{aligned}i\delta\theta_2 &= 0.80\ i\delta\theta_1,\\ \delta b_2 &= 0.80\ \delta b_1,\end{aligned}$$

the subscript numerals distinguishing the values which pertain to the two groups. The coefficient 0.80 presupposes that the position of the node and the tabular latitudes of the stars are correct at the epoch 1842, which is about as good a hypothesis as we can make. The combination of the two groups has been made on the supposition that all the equations of the second group are first multiplied by 1.25, and that $i\delta\theta_2$ and δb_2 are then replaced by 0.80 $i\delta\theta_1$ and 0.80 δb_1. This course is taken because the residuals show that the unit of weight corresponds to a smaller probable error in the second group than in the first. The combined normals are:—

$$\begin{array}{rrrrr}
39.56\,\delta\varepsilon_2 + & 0.00\,\delta\varepsilon_1 - & 2.32\,i\delta\theta_1 + & 0.75\,\delta b_1 - & 583''.55 = 0 \\
0.00 & +18.43 & +2.61 & -\;\;1.52 & -538''.27 = 0 \\
-2.32 & +\;\;2.61 & +9.53 & -\;\;0.04 & -\;\;41''.00 = 0 \\
0.75 & -\;\;1.52 & -0.04 & +21.16 & -\;\;\;3''.72 = 0.
\end{array}$$

The solution of these equations gives—

$$\begin{array}{ll}
\delta\varepsilon_1 = +\,29''.38 \pm 1''.0; & \text{epoch, } 1680.0. \\
\delta\varepsilon_2 = +\,14''.78 \pm 0''.6; & \text{epoch, } 1712.5. \\
i\delta\theta_1 = -\;\;0''.14 \pm 1''.2; & \text{weight} = \;\;9. \\
\delta b_1 = +\;\;1''.76 \pm 0''.8; & \text{weight} = 21.
\end{array}$$

The probable error of each equation of weight unity is about $3''.6$; and as all the equations of the second series were multiplied by the factor 1.25, the probable error of each observed distance of centre of moon from star would be about $3''.0$, which is the error already estimated from errors of star-places and of the tabular perturbations and from the irregularities of the moon's limb. It is, therefore, from these sources, rather than from errors of the observed times, that the errors of the equations arise, so that, when, in the course of time, the tabular perturbations and the places of the stars are more accurately determined, more accurate results may be obtained from these occultations.

Observations of CASSINI *at Paris and* DELISLE *at St. Petersburg, between* 1720 *and* 1750.

I have not attempted any serious discussion of these observations, having merely sought to obtain from them an approximate correction to the mean longitude for some epoch near 1725. From the good observations between 1725 and 1730 inclusive, we find:—

$$\text{Epoch, } 1728.5\text{: } \delta\varepsilon = +\,7''.3 \text{ (8 observations),}$$

a result I look upon with a suspicion of its being a little too large, owing to several of the observations on which it depends having been made at the moon's bright limb.

§ 14.

OBSERVATIONS OF ECLIPSES FROM 1620 TO 1724.

The tabular places of the sun which are used in the reduction of these eclipses were accidentally omitted in § 11, where the corresponding places of the moon are given. They are, therefore, given in the following table. They were generally computed for different mean times by different computers, in order that the comparison of the results might serve as a check on the accuracy of the work. The original results are all presented.

Longitudes of the Sun, from HANSEN'S *Tables.*

Date.	Greenwich Mean Time.			Longitude Mean Equinox.		
	h	m	s	°	′	″
1621, May 20	12	0	0	59	54	17.2
“ “	18	39	34	60	10	17.5
“ “	21	5	10	60	16	6.7
“ “	24	0	0	60	23	7.0
1633, Apr. 8		− 9	21	18	49	44.4
“ “	4	48	0	19	1	53.7
1639, June 1	0	0	0	70	34	56.8
“ “	3	36	0	70	43	33.2
“ “	12	0	0	71	3	38.7
1645, Aug. 21	0	0	0	148	34	19.5
1652, Apr. 8	0	0	0	19	13	46.4
1654, Aug. 11	12	0	0	139	14	52.0
“ “	20	0	0	139	34	4.9
“ “	24	0	0	139	43	42.3
1656, Jan. 26	0	0	0	306	20	48.4
“ “	0	30	0	306	22	4.6
“ “	12	0	0	306	51	15.8
1675, June 22	16	0	0	91	33	18.9
1661, Mar. 29	12	0	0	9	43	36.3
“ “	21	0	0	10	5	48.0
1666, July 1	12	0	0	100	8	14.7
“ “	17	36	0	100	21	35.2
“ “	24	0	0	100	36	50.3
1676, June 10	12	0	0	80	40	27.8
“ “	20	0	0	80	59	33.3
“ “	24	0	0	81	9	6.0
1684, July 12	0	0	0	110	46	12.2
“ “	2	16	0	110	51	36.8
“ “	12	0	0	111	14	49.5
1687, May 11	0	0	0	50	48	33.9
“ “	1	0	0	50	50	58.0
“ “	12	0	0	51	17	27.5
1689, Sept. 13	0	0	0	171	14	54.4
“ “	3	20	0	171	23	3.5
“ “	12	0	0	171	44	12.9
1699, Sept. 22	12	0	0	180	8	18.3
“ “	24	0	0	180	37	45.2
1706, May 11	12	0	0	50	42	54.2
“ “	20	20	0	51	2	59.1
“ “	24	0	0	51	11	48.5
1708, Sept. 13	12	0	0	171	9	8.0
“ “	18	30	0	171	25	5.2
“ “	24	0	0	171	38	30.5
1715, May 2	12	0	0	41	51	20.2
“ “	19	12	0	42	8	45.5
“ “	24	0	0	42	20	22.2
1724, May 22	0	0	0	61	26	25.8
“ “	12	0	0	61	55	13.2
“ “	24	0	0	62	24	0.0

The observations in question may be divided into two classes: observations of contacts and of phases. The latter were generally estimated by throwing the sun's image upon a screen so adjusted that the outline of the image should coincide with a circle drawn on the screen. The radius of this circle was divided into 12, 30, or 32 parts by concentric circles, so that the corresponding phases of the eclipse could be observed. The absolute magnitude of a phase thus determined is necessarily too uncertain to be relied on, owing to the effect of irradiation and distortion of image; but, so far as longitude is concerned, this effect will act in opposite directions before and after the time of greatest eclipse. Therefore, by subtracting from each other the corresponding observations before and after the middle, we shall obtain results nearly free from the errors in question. This is the course which has been generally adopted in the discussion of these observations. Whenever possible, observations at nearly equal distances on each side of the middle have alone been compared, the mean of two or more being sometimes combined with a single corresponding one on the opposite side. When the observations were so broken that there was no correspondence, the combination was made in the way which seemed adapted to give the most probable result.

The details of reduction are presented pretty fully in the following forms:—Under the head of each eclipse is given the apparent semi-diameter of the the moon as seen from the station at the beginning and at the end of the eclipse, computed with the same data and in the same way as in the case of occultations. The sun's apparent semi-diameter is computed by supposing its value at distance unity to be 960″. In some cases, however, it may not exactly correspond to this constant, some value a little different being used. Any small error in the semi-diameter being in great part eliminated from the result, no great pains were taken with it.

The local mean times of the observed phases are, for the most part, derived from data already given by applying the clock-corrections derived from altitudes or other sources. In the observations of Gassendus, the times are derived immediately from the observed altitudes.

This time being reduced to Greenwich mean time, the apparent position of the moon as seen from the station is computed in the same way as for the occultations, except that, instead of using the parallax of the moon, only the difference of parallaxes of the sun and moon are employed. From this reduced position of the moon, and from the geocentric position of the sun, are derived the tabular distance of the centres, which is given in the column following the mean times. To this tabular distance is added its differential coefficient with respect to the moon's mean longitude.

This is followed by the observed distance of centres as derived from the contacts or measures of phase made by the observers, the formulæ being:—

$$D = s + s' - m,$$

m being the magnitude of the eclipse, which was usually expressed in terms of the sun's semi-diameter, and s and s' the apparent semi-diameters of the sun and moon respectively. If Δ expressed the number of digits eclipsed, we should have:—

$$m = \frac{\Delta s}{6}.$$

In the case of contacts, m would represent the magnitude of the least noticeable eclipse at beginning, or the magnitude immediately less than the least visible at ending. These two values of m are represented by α_1 and α_2, and in combining observations of contacts we have always supposed—

$$\alpha_1 = 2\ \alpha_2.$$

At the same time, double weight is always given to an observation of ending, as compared with that of beginning, because the observer is less likely to fail in noting the time when the eclipse disappears than when it appears. By this combination, the mean result from the beginning and end of an eclipse is independent of the value which may be assigned to α_2, and therefore does not require any investigation of the value of that quantity. We may simply regard α_1 and α_2 as zero, and give double weight to the observation of the end of the eclipse as compared with that of beginning.

In combining observations of contacts and phases to obtain a mean result, it has generally been supposed that one pair of contacts is worth three or four pairs of observations of phase, the proportion varying with the apparent accuracy of the observations of phase. In a few cases, weights are assigned to the observations of phases; but, in general, there are no data for such an assignment.

To facilitate the final discussion, the difference between each observed and tabular distance is given for each separate observation. This difference is the absolute term of an equation containing $\delta\varepsilon$, and an unknown combination of quantities depending on errors in the mode of observation, which are supposed to be a function of D. This combination is eliminated from each pair of observations, at equal distances on each side of the middle, in the manner already described, leaving an equation in ε alone. It has not been considered necessary to write down the individual equations thus formed. The most probable results, generally obtained by combining the equations in a summary manner, approximately, though not strictly by the method of least squares, are given in connection with each set of observations.

Eclipse of 1621, *May* 20, *observed by* GASSENDUS *at Aix.*

Moon's apparent semi-diameter at beginning		$936''.4$
Moon's apparent semi-diameter at end		$942''.7$
Sun's apparent semi-diameter		$949''.0$
Local M. T., $19^h\ 1^m\ 37^s$.	Tabular distance of centres	$1980''.7 - 1.00\ \delta\varepsilon$
	Observed distance of centres	$1885''.4 - \alpha_1$
$21^h\ 27^m\ 17^s$.	Tabular distance of centres	$1827''.4 + 0.93\ \delta\varepsilon$
	Observed distance of centres	$1891''.7 - \alpha_2$.
Result from first contact		$\delta\varepsilon = +95'' + \alpha_1$
Result from last contact		$\delta\varepsilon = +69'' - \alpha_2$
Mean by weights		$\delta\varepsilon = +78''$.

The values of α come out negative, a result which can be attributed only to errors in the determinations of time.

Eclipse of 1630, *June* 10, *observed by* GASSENDUS *at Paris.*

Moon's apparent semi-diameter at beginning		$946''.2$
Sun's apparent semi-diameter at beginning		$946''.0$
At $6^h\ 15^m\ 1^s$.	Tabular distance of centres	$1912''.8$
	Observed distance of centres	$1892''.2 - \alpha_1$
Result of the observation of first contact		$\delta\varepsilon = +20'' + \alpha_1$

The value of α_1 may be conjecturally estimated at $15''$, giving as the result

$$\delta\varepsilon = +35''.$$

Eclipse of 1633, *April* 8, *observed by* GASSENDUS *at Digne.* (See p. 81.)

Moon's apparent semi-diameter at beginning .	937″.5
Moon's apparent semi-diameter at end . . .	932″.9
Sun's semi-diameter	957″.2

Obs. Alt. of ⊙.	Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.	Corr. to Tabular Dist.	Wt.
° ′	*h* *m*	′	′	′	
27 15:	3 57.6:	22.3 −0.89 $\delta\varepsilon$	19.6:	−2.7:	0
25 15:	4 9.2:	17.9 −0.82	16.4:	− 1.5::	0
22 3	4 27.5	11.8 −0.58	12.9	+ 1.1	1
21 33	4 30.3	11.1 −0.51	11.6	+ 0.5	1
20 48	4 34.6	10.2 −0.36	10.0	− 0.2	1
20 24	4 36.9	9.8 −0.26	9.7	− 0.1	1
19 30	4 42.0	9.4 −0.04	9.5	+ 0.1	0
19 2	4 44.6	9.4 +0.08	9.5	+ 0.1	0
18 16	4 49.9	9.8 +0.33	10.0	+ 0.2	0
16 51	4 56.9	11.2 +0.40	11.1	− 0.1	0
16 17	5 0.1	12.0 +0.65	11.6	− 0.4	0
15 54	5 2.2	12.7 +0.68	12.4	− 0.3	1
15 39	5 3.6	13.2 +0.71	13.4	+ 0.2	1
15 23	5 5.1	13.7 +0.74	14.0	+ 0.3	1
14 57	5 7.5	14.5 +0.77	15.0	+ 0.5	1
14 22	5 10.8	15.7 +0.82	16.9	+ 1.2	1
13 46	5 14.1	17.0 +0.84	17.4	+ 0.4	1
13 13	5 17.2	18.2 +0.86	18.2	0.0	1
12 44	5 20.0	19.4 +0.88	19.6	+ 0.2	1
12 34	5 20.9	19.7 +0.88	20.1	+ 0.4	1
12 11	5 23.0	20.6 +0.89	21.7	+ 1.1	1
11 38	5 26.1	22.0 +0.90	23.5	+ 1.5	1
11 19	5 27.9	22.7 +0.91	24.3	+ 1.6	1
10 45	5 31.0	24.1 +0.92	26.2 25.8	+ 1.9	2
9 52	5 36.0	26.3 +0.93	27.2 27.3	+ 1.0	3
9 5	5 40.4	28.4 +0.95	29.1 29.6	+ 1.1	4
8 5	5 46.1	31.07 +0.97	31.50 − a_2	+ 0.4	4

Where two observed distances are given, the second is from the degrees of the circumference eclipsed. A typographical error in the printed record of the first observation renders the time doubtful. The correspondence of the second observation to the time given is entirely conjectural. The nine or ten following ones are of very little weight for determining the moon's longitude; but the minuteness of the correction which they indicate to the tabular distance of centres, at the time of greatest eclipse, seems to show that GASSENDUS's determinations of the magnitude of the eclipse were nearly free from constant error. I have therefore used all the subsequent measures with the weights as given, and the resulting correction to the moon's mean longitude is

$$\delta\varepsilon = +0'.88 = +53''.$$

Eclipse of 1639, *June* 1, *observed by* GASCOIGNE *at Middletown.*

$\phi = 53^\circ\ 45'$; $\lambda = 6^m\ 8^s$ W.

(See FLAMSTEED, *Historia Coelestis*, vol. i, p. 2.)

Moon's apparent semi-diameter at beginning . . .	939″.0
Moon's apparent semi-diameter at end	935″.4
Sun's apparent semi-diameter	945″.6

No. of Phase.	Obs. Alt. of ⊙.	Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.	Corr. to Tabular Dist.
	° ′	h m s	″	″	″
1	36 35	3 48 04	$1936 - .95\,\delta\varepsilon$	$1885 - a_1$	− 51
2	33 51	4 6 58	1449 − .93	1450	+ 1
3	30 47	27 47	912 − .87	881	− 31
4	26 30	56 49	343 + .02	360	+ 17
5	25 58	5 0 27	348 + .31	369	+ 21
6	25 20	4 45	390 + .59	483	+ 93
7	23 23	18 0	668 + .91	748	+ 80
8	21 38	29 58	987 + .97	1059	+ 72
9	20 53	35 7	1132 + .98	1220	+ 88
10	20 11	39 56	1270 + .98	1315	+ 45
11	19 28	44 54	1415 + .99	1446	+ 31
12	18 12	53 42	1676 + .99	1700	+ 24
13	17 20	59 47	1858 + .99	$1881 - a_2$	+ 23

The contacts alone here give,

$$\delta\varepsilon = +33'',\ \text{wt.} = 8.$$

Phase 2, compared with the mean of 10, 11, and 12, gives the equation $1.92\,\delta\varepsilon = +32''$, whence

$$\delta\varepsilon = +17'',\ \text{wt.} = 4.$$

Phase 3, compared with the mean of 7 and 8, gives $1.81\,\delta\varepsilon = 106''$, whence

$$\delta\varepsilon = +59'',\ \text{wt.} = 3.$$

Giving these results the respective weights assigned, we have, as the mean result,

$$\delta\varepsilon = +34'' \pm 10''.$$

Eclipse of 1639, *June* 1, *observed by* HORROX, *at or near Toxteth Park.*

$\phi = 53^\circ\ 20'$; $\lambda = 11^m\ 48^s.4$ W. from Greenwich.

Moon's apparent semi-diameter at beginning . .	$939''.1$
Moon's apparent semi-diameter at end	$935''.7$
Sun's apparent semi-diameter	$945''.6$

Local Mean Time.			Tabular Dist. of Centres.	Observed Distance.	Corr. to Tabular Dist.	Wt.
h	*m*	*s*	$''$	$''$	$''$	
3	43	18	$1911 - .94\,\delta\varepsilon$	$1886 - a_1$	− 25	.
	47	3	1817 − .94	1809*	− 8	2
	50	48	1722 − .94	1697	− 25	.
	53	33	1652 − .93	1629	− 23	2
	59	3	1511 − .93	1507	− 4	.
4	3	48	1390 − .92	1381	− 9	.
	8	48	1262 − .91	1255	− 7	.
	10	3	1231 − .90	1223	− 8	.
	12	18	1174 − .89	1160	− 14	.
	17	33	1041 − .87	1002	− 39	.
	20	18	972 − .86	941	− 31	2
	26	3	827 − .81	813	− 14	.
	32	3	689 − .75	655	− 34	.
	35	48	603 − .70	591	− 12	2
	43	33	455 − .46	454	− 1	2
	48	3	397 − .21	401	+ 4	2
	50	18	381 − .05	385	+ 4	.
	57	18	397 + .44	417	+ 20	.
5	6	18	539 + .79	559	+ 20	2
	9	33	610 + .84	622	+ 12	.
	14	3	714 + .89	732	+ 18	2
	21	33	910 + .95	937	+ 27	2
	24	3	976 + .96	1000	+ 24	.
	35	18	1292 + .98	1336	+ 44	.
	38	33	1385 + .98	1441	+ 56	.
	41	33	1472 + .99	1504	+ 32	.
	43	48	1537 + .99	1578	+ 41	2
	46	3	1603 + .99	1630	+ 27	.
	48	18	1670 + .99	1693	+ 23	.
	49	3	1692 + .99	1725	+ 33	.
	54	33	$1846 + .99\,\delta\varepsilon$	$1883 - a_2$	+ 37	.

* Derived from "Circumferentia Eclipsata" 33°.

The original observations are found in HORROX's *Opuscula Astronomica*, London, 1673, page 327, and again on page 388. I could not learn the exact position of HORROX: the longitude given above and employed is taken from a map, but the latitude is that given by HORROX.

The separate results for reducing the clock to mean time as derived from altitudes are:—

Clock Time.			Correction.	
h	*m*	*s*	*m*	*s*
2	30	0	− 2	26
2	38	0	− 2	37
3	18	45	− 2	37
4	15	15	− 0	50
5	17	45	− 1	58
5	59	30	− 1	3
6	5	45	− 2	6
6	7	15	− 3	1
6	8	45	− 2	46
6	10	30	− 2	46
6	12	45	− 2	20
6	17	15	− 1	55
Mean			− 2	12 ± 8^s

The contacts alone give . . . . $\delta\varepsilon = +34''$;
The observations of phase . . . . . . $\delta\varepsilon = +27''$ (12 pairs);
The phase from angle eclipsed . . . . . $\delta\varepsilon = +\ 8''$.

The most probable mean from all the observations,

$$\delta\varepsilon = +27''.$$

Judging from the discordance of the measures, the probable error of this result would not exceed 3″; but the possibility of systematic error must be taken into account. We can hardly suppose a set of observations made at this epoch to have a probable error less than 5″; and when we add the uncertainties respecting clock-error and geographical position, the probable error may be increased to 8″ or 9″.

Eclipse of 1639, June 1.2, observed by GASSENDUS *at Aix.*

$\phi = 43^\circ\ 32'$; $\lambda = 21^m\ 47^s$ W.

Moon's apparent semi-diameter at beginning .	935″.0
Moon's apparent semi-diameter at end . . .	930″.9
Sun's semi-diameter	947″.3

Obs. Alt. of ⊙.	Local Mean Time.	Tabular Distance of Centres.	Observed Distance.	Corr. to Tabular Dist.	Obs. Alt. of ⊙.	Local Mean Time.	Tabular Distance of Centres.	Observed Distance.	Corr. to Tabular Dist.
° ′	h m	′	′	′	° ′	h m	′	′	′
?	4 40.9	31.8 −0.89 $\delta\varepsilon$	31.4 − a_1	−0.4 − a_1	19 45	5 30.3	12.1 −0.44 $\delta\varepsilon$	11.8	−0.3
28 10:	43.3:	30.8 − .88	31.4 − a_1	. .	19 30	31.7	11.7 − .40	11.1	−0.6
28 0	44.0	30.5 − .88	29.8	−0.7	19 25	32.2	11.6 − .37	10.8	−0.8
27 40	45.9	29.6 − .88	29.4	−0.2	19 5	34.1	11.1 − .30	10.3	−0.8
27 20	47.8	28.8 − .87	28.3	−0.5	18 55	35.0	10.9 − .26	10.2	−0.7
27 0	49.7	28.0 − .87	27.7	−0.3	18 36	36.8	10.7 . .	9.9	−0.8
26 37	51.9	27.1 − .86	27.1	0.0	18 0	40.2	10.1 . .	10.0	−0.1
26 10	54.3	26.0 − .85	25.7	−0.3	17 16	44.4	10.0 . .	9.9	−0.1
26 2	55.1	25.7 − .85	25.0	−0.7	16 40	47.8	10.2 . .	9.8	−0.4
25 30	58.0	24.4 − .84	24.5	+0.1	16 0	51.6	10.7 + .51	10.5	−0.2
25 24	58.6	24.2 − .84	23.7	−0.5	15 30	54.5	11.3 + .62	11.7	+0.4
25 0	5 0.8	23.2 − .83	22.8	−0.4	15 0	57.4	12.1 + .68	12.7	+0.6
24 40	2.7	22.4 − .83	21.9	−0.5	14 40	59.4	12.7 + .73	13.0	+0.3
24 25	4.1	21.8 − .82	20.9	−0.9	13 58	6 3.5	13.9 + .78	14.0	+0.1
24 5	6.0	21.1 − .80	20.0	−1.1	13 35	5.7	14.9 + .81	14.9	0.0
23 40	8.3	20.1 − .78	19.4	−0.7	13 25	6.7	15.3 + .82	15.5	+0.2
23 30	9.2	19.7 − .77	19.0	−0.7	13 5	8.6	16.1 + .84	16.2	+0.1
23 20	10.1	19.4 − .76	18.9	−0.5	12 48	10.2	16.7 + .85	16.8	+0.1
23 0	12.0	18.6 − .73	18.2	−0.4	11 18	19.1	20.6 + .91	21.1	+0.5
22 55	12.5	18.4 − .73	17.9	−0.5	11 0	20.9	21.5 + .91	21.5	0.0
22 30	14.8	17.5 − .72	16.7	−0.8	10 37	23.1	22.5 + .93	22.5	0.0
22 15	16.2	16.9 − .70	16.5	−0.4	10 27	24.1	23.0 + .93	22.8	−0.2
22 0	17.6	16.4 − .68	15.6	−0.8	10 10	25.8	23.8 + .94	23.4	−0.4
21 2	23.0	14.4 − .60	14.0	−0.4	10 0	26.8	24.3 + .94	24.1	−0.2
20 30	26.1	13.4 − .55	12.4	−1.0	9 45	28.3	25.0 + .95	25.0	0.0
20 20	27.0	13.1 − .53	11.9	−1.2	9 30	29.7	25.7 + .95	26.2	+0.5
20 3	28.6	12.6 − .49	11.8	−0.8	9 0	32.8	27.3 + .95	27.6	+0.3

The constant error in the observations of phase would seem to be very small. I have, therefore, used the first four certain observations of phase by themselves, and in the case of the remainder have combined observations after the middle with corresponding ones before. The result is

$$\delta\varepsilon = +0'.38 = +23''.$$

Eclipse of 1639, *June* 1, *observed by* Hevelius.

Moon's semi-diameter at beginning .	936″.5
Moon's semi-diameter at end . . .	932″.4
Sun's semi-diameter	947″.0

Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.	Obs. Dist. corr. for Irrad.	Corr. to Tabular Dist.	Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.	Obs. Dist. corr. for Irrad.	Corr. to Tabular Dist.
h m	′ ′	′	′	′	h m	′ ′	′	′	′
5 17.8	$31.15 - 1.00\delta\varepsilon$	$31.39 - a_1$	$31.4 - a_1$	$+0.3 - a_1$	6 23.9	$2.9 + 0.99\delta\varepsilon$	6.7	4.3	+ 1.4
5 28.1	26.0 −1.00	26.3	25.8	−0.2	6 25.5	3.6 +0.99	7.1	4.7	+ 1.1
5 33.2	23.5 −1.00	24.8	24.1	+0.6	6 26.9	4.3 +0.99	7.4	5.1	+ 0.8
5 38.6	20.8 −1.00	24.1	23.4	+2.6	6 28.6	5.1 +0.99	7.7	5.4	+ 0.3
5 42.2	18.9 −1.00	21.9	21.0	+2.1	6 30.1	5.8 +1.00	8.5	6.3	+ 0.5
5 45.7	17.2 −0.99	20.0	18.9	+1.7	6 32.6	7.2 +1.00	10.7	8.7	+ 1.5
5 48.2	15.9 −0.99	19.1	17.9	+2.0	6 34.2	8.0 +1.00	11.2	9.3	+ 1.3
5 50.7	14.6 −0.99	18.5	17.3	+2.7	6 36.1	9.0 +1.00	12.1	10.3	+ 1.3
5 53.2	13.4 −0.99	17.7	16.4	+3.0	6 38.2	10.2 +1.00	13.0	11.3	+ 1.1
5 55.2	12.4 −0.98	15.6	14.1	+1.7	6 40.1	11.1 +1.00	14.0	12.4	+ 1.3
5 57.6	11.2 −0.98	14.0	12.3	+1.1	6 41.9	12.0 +1 00	15.6	14.1	+ 2.1
5 59.6	10.2 −0.98	13.4	11.6	+1.4	6 44.2	13.4 +1.00	17.2	15.9	+ 2.5
6 1.7	9.1 −0.98	13.1	11.3	+2.2	6 45.9	14.3 +1.00	18.1	16.9	+ 2.6
6 4.1	7.9 −0.97	12.5	10.6	+2.7	6 49.3	16.1 +1.00	19.0	17.8	+ 1.7
6 6.0	6.9 −0.97	12.0	10.1	+3.2	6 50.7	16.9 +1.00	19.7	18.6	+ 1.7
6 8.0	5.9 −0.96	11.2	9.2	+3.3	6 52.7	18.0 +1.00	20.8	19.8	+ 1.8
6 10.7	4.5 −0.95	9.3	7.1	+2.6	6 54.1	18.7 +1.00	21.4	20.5	+ 1.8
6 11.9	3.9 −0.92	8.0	5.7	+1.8	6 55.9	19.7 +1.00	22.2	21.4	+ 1.7
6 13.4	3.1 . .	7.4	5.0	+1.9	6 57.8	20.8 +1.00	22.5	21.7	+ 0.9
6 17.1	1.4 . .	4.9	2.3	+0.9	7 0.9	22.5 +1.00	22.8	22.0	− 0.5
6 18.1	1.2 . .	3.6	0.9	−0.3	7 3.5	23.9 +1.00	24.4	23.8	− 0.1
6 19.3	1.1 . .	4.0	1.3	+0.2	7 5.3	24.9 +1.00	25.0	24.4	− 0.5
6 21.0	1.5 +0.97	5.6	3.1	+1.6	7 6.7	25.7 +1.00	26.0	25.5	− 0.2
6 22.8	2.3 +0.99	6.2	3.6	+1.3	7 12.0	28.6 +1.00	31.3	31.3	(+ 2.7)

Hevelius gives a number of drawings of phases of this eclipse, showing that his instrument was altogether out of focus, the cusps of the sun being so rounded near the time of greatest phase that the arc of sunlight was of nearly equal breadth throughout. For this reason, and also because the times depend entirely on some kind of a sun-dial which may not have been in the meridian, this eclipse was in the first place rejected entirely. (See p. 88 for original note upon it.) But I afterward concluded to reduce it, if only to see what kind of a result would be obtained from the worst set of observations found in his work.

The irradiation seems, from the excess of about 3′ near the observations of greatest phase, to have been about one-tenth the sun's semi-diameter. In the column of corrected distances from observations, the observed eclipse is increased by its tenth part to allow for this. Owing to the uncertainty of the law of error, I have only combined observations of nearly equal phase on each side of the middle in the same way as with the eclipses of Gassendus. The contacts are rejected entirely, as there is clearly a mistake of several minutes in the observation of the end. The mean of the first seventeen observations of phase gives an excess of observed distance before the middle of the eclipse of 2′.03. The mean of the last twenty gives an excess of 1′.14. This would indicate a tabular correction of

$$-27'',$$

a result to which scarcely any weight can be given, owing to the uncertainty whether the adjustment of the instrument really remained the same during the eclipse, and whether the dial was really free from error.

Eclipse of 1645, *August* 21, *observed by* HEVELIUS.

Moon's semi-diameter at beginning .	959″.4
Moon's semi-diameter at end . . .	957″.4
Sun's semi-diameter	951″.2

Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.	Corr. to Tabular Dist.	Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.	Corr. to Tabular Dist.
h *m* *s*	″	″	″	*h* *m* *s*	″	″	″
23 26 37	1942 − 0.93 $\delta\varepsilon$	1911 − α_1	− 31 − α_1	0 34 22	720 − 0.22 $\delta\varepsilon$	762 (?)	(+ 42)
29 52	1871 − 0.92	1831	− 40	44 12	682 + 0.10	683	+ 1
36 22	1732 − 0.90	1672	− 60	48 22	691 + 0.25	722	+ 31
40 52	1634 − 0.89	1593	− 41	53 32	717 + 0.42	762	+ 45
45 22	1541 − 0.87	1514	− 27	57 37	754 + 0.54	801	+ 47
48 22	1478 − 0.86	1415	− 63	1 4 42	844 + 0.67	880	+ 36
58 52	1265 − 0.82	1237	− 28	8 52	903 + 0.74	960	+ 57
0 4 22	1160 − 0.76	1118	− 42	11 22	943 + 0.78	999	+ 56
10 22	1048 − 0.72	1039	− 9	15 12	1013 + 0.82	1078	+ 65
14 22	981 − 0.66	960	− 21	18 22	1066 + 0.86	1117	+ 51
19 22	899 − 0.59	880	− 19	22 2	1152 + 0.89	1191	+ 39
23 52	835 − 0.50	822	− 13	26 37	1226 + 0.91	1276	+ 50
24 52	822 − 0.48	801	− 21	34 22	1386 + 0.95	1434	+ 48
27 52	784 − 0.41	781	− 3	50 22	1730 + 0.98	1790	+ 60
29 52	761 − 0.36	762	+ 1	51 52	1770 + 0.98	1830	+ 60
32 52	733 − 0.27	742	+ 9	55 52	1861 + 0.99	1909 − α_2	+ 48 − α_2

A system of twelve equations of condition is formed by subtracting the first twelve residuals from the last twelve, contact results excepted. The solution of these equations, slightly greater weight being given to those near the beginning and end of the eclipse, gives

$$\delta\varepsilon = +54''.$$

From the contacts we have:—

$$\text{Beginning} \quad \ldots\ldots\ldots\ldots \quad \delta\varepsilon = +31'' + \alpha_1;$$
$$\text{End} \quad \ldots\ldots\ldots\ldots\ldots \quad +48'' - \alpha_2;$$

from which, supposing $\alpha_1 = 2\,\alpha_2$, we have $\delta\varepsilon = +42''$. I take, as the most probable result from this eclipse,

$$\delta\varepsilon = +51''.$$

Eclipse of 1652, *April* 7, *observed by* GASSENDUS *at Digne.*

The end of this eclipse occurred within a few minutes of noon, and it is not likely that any reliance can be placed upon the times deduced from altitudes during the last hour of the eclipse. I have, therefore, concluded to make no use of the observations of GASSENDUS.

Eclipse of 1652, *April* 7–8, *observed by* HEVELIUS.

Moon's apparent semi-diameter at beginning .	997″.7
Moon's apparent semi-diameter at end . . .	996″.8
Sun's semi-diameter	957″.8

Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.		Corr. to Tab. Distance.		Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.		Corr. to Tab. Distance.	
h m s	′	″	″	″	″	h m s	″	″	″	″	″
23 5 27	$1919-1.10\delta\varepsilon$	$1955-\alpha_1$		+36	+36	0 9 9	$538-0.42\delta\varepsilon$	509		−29	
16 32	1629−1.10	1604	1579	−25	−50	12 34	528−0.24	459		−69	
18 30	1558−1.10	1536	1509	−22	−49	14 15	527−0.14	499		−28	
21 2	1515−1.09	1516	1487	+ 1	−28	27 55	652+0.51	638		−14	
22 52	1470−1.09	1476	1447	+ 6	−23	30 17	690+0.58	698		+ 8	
24 49	1419−1.09	1436	1406	+17	−13	39 6	864+0.76	891		+27	
26 54	1365−1.09	1386	1356	+21	− 9	42 11	931+0.80	957		+46	
28 54	1315−1.08	1317	1288	+ 2	−27	51 6	1136+0.89	1197		+61	
31 45	1245−1.07	1253		+ 8		53 5	1184+0.91	1277		+93	
35 10	1162−1.06	1157		− 5		54 40	1222+0.92	1285		+63	
37 32	1104−1.05	1097		− 7		1 14 54	1731+0.99	1795	1780	+64	+49
38 54	1072−1.04	1037		−35		16 58	1782+0.99	1835	1823	+53	+41
46 5	910−1.00	891		−19		18 25	1821+1.00	1895	1889	+74	+68
48 31	857−0.98	838		−19		21 3	1887+1.00	$1955-\alpha_2$		$+67-\alpha_2$	+67
0 6 26	562−0.53	578		+16							

Here, it is evident, the observed distances are systematically too great for the mean phases, and it is impossible to satisfactorily eliminate this error in the way we have generally adopted in the case of these eclipses, because there is a gap near the beginning of the eclipse, corresponding to the best observations near the end, while the gap between $0^h\ 55^m$ and $1^h\ 14^m$ corresponds to the best series near the beginning. The systematic error in question seems to be zero, or even negative, near the middle of the eclipse. Under these circumstances, our best course seems to be to correct the observed distances by an empirical formula, and to give most weight to the observations near the extreme phases. We choose the correction,

$$\delta D = -30'' \left\{ 1 - \left(\frac{D - 1400}{555} \right)^2 \right\},$$

by applying which we form the second column of observed distances and of correction to the tabular distances. Where this second column is not formed, we have corresponding observations before and after the middle of the eclipse.

Commencing now with the consideration of the contacts, the considerable magnitude of the eclipse at the observed moment of contact renders it suspicious; still, as

HEVELIUS says, it was observed "accuratissimé", I have not felt justified in rejecting it. Combining the observations of first and last contacts in the usual manner, we find:—

$$\delta\varepsilon + 33'', \text{ wt.} = 2.$$

The mean of the seven observations following first contact, using the corrected distances, gives

$$\delta\varepsilon = + 26'', \text{ wt.} = 1.$$

The mean of the three observations preceding last contact gives

$$\delta\varepsilon = + 53'', \text{ wt.} = 2.$$

The result of the intermediate observations, five on each side of the middle of the eclipse, in which the distance exceeds 890″, formed by taking the differences of the corresponding measures on each side, is:—

$$\delta\varepsilon + 36'', \text{ wt.} = 3;$$

the mean result of all the measures,

$$\delta\varepsilon = + 38''.$$

Considering the uncertainty of the times and of the measures, the probable error of this result cannot be much below 10″.

Eclipse of 1654, *August* 11, *observed by* WALTERIUS *at Aix.*

Moon's semi-diameter at beginning .	970″
Moon's semi-diameter at end . . .	973″
Sun's semi-diameter	948″

Obs. Alt. of ⊙.	Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.	Δ	Obs. Alt. of ⊙.	Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.	Δ
° ′	h m	′	′	′	° ′	h m	′	′	′
35 30	20 24.9	$32.0 - 1.00\delta\varepsilon$	$32.0 - a_1$	0.0	51 10	22 1.1	$15.6 + 0.78\delta\varepsilon$	16.2	+ 0.6
36 15	20 29.3	30.2 − 0.99	29.3	− 0.9	52 2	22 7.2	17.1 + 0.86	17.5	+ 0.4
38 35	20 42.7	25.3 − 0.94	24.1	− 1.2	52 26	22 10.1	18.0 + 0.89	18.8	+ 0.8
39 45	20 49.5	22.8 − 0.89	22.8	0.0	53 12	22 15.6	19.5 + 0.94	20.2	+ 0.7
41 10	20 57.8	20.0 − 0.82	21.5	+ 1.5	53 50	22 20.6	21.1 + 0.97	21.5	+ 0.4
41 35	21 0.3	18.3 − 0.80	18.8	+ 0.5	54 21	22 24.7	22.4 + 1.00	22.8	+ 0.4
42 35	21 6.2	17.4 − 0.72	17.5	+ 0.1	54 55	22 29.2	23.9 + 1.02	24.1	+ 0.2
43 6	21 9.3	16.5 − 0.67	16.2	− 0.3	55 20	22 32.7	25.1 + 1.03	25.5	+ 0.4
45 35	21 24.3	13.2 − 0.32	13.6	+ 0.4	55 33	22 34.5	25.7 + 1.04	26.8	+ 1.1
47 14	21 34.9	12.2 + 0.04	12.3	+ 0.1	55 58	22 38.0	26.8 + 1.05	28.1	+ 1.3
48 10	21 40.9	12.4 + 0.25	10.9	− 1.5	56 18	22 41.0	27.9 + 1.05	29.4	+ 1.5
49 7	21 47.2	13.0 + 0.46	13.6	+ 0.6	57	22 47.4	30.1 + 1.07	30.7	+ 0.6
50 20	21 55.3	14.3 + 0.66	14.9	+ 0.6	57 20	22 50.4	31.2 + 1.07	$32.0 - a_2$	+ 0.8

There is no evidence of systematic error in the determination of the phases. If we take the sum of all the equations in which the coefficient exceeds 0.6, the contacts excepted, we have:—

Sum of seven equations near beginning	$5.83\ \delta\varepsilon$	$= 0'.3$
Sum of thirteen equations near end . .	12.36	$9'.0$
Sum of all	18.19	$9'.3$.

From which we find $\delta\varepsilon = +0'.51$. Supposing $\alpha_2 = \frac{1}{2}\alpha_1$, the contacts alone will give $\delta\varepsilon = +0'.53$. We may therefore put, as the result of this eclipse,

$$\delta\varepsilon = +31''.$$

Eclipse of 1661, *March* 29–30, *observed by* Hevelius.

Moon's apparent semi-diameter at beginning .	1006″.0
Moon's apparent semi-diameter at end . . .	1006″.5
Sun's apparent semi-diameter	959″.9

Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.	Corr. to Tab. Dist.	Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.	Corr. to Tab. Dist.
h m s	″	″	″	h m s	″	″	″
22 19 10	$1991 - 1.03\,\delta\varepsilon$	$1966 - a_1$	− 25	23 53 47	$1014 + 0.88\,\delta\varepsilon$	967	− 47
20 33	1954 − 1.03	1926	− 28	0 4 39	1235 + 0.99	1247	+ 12
21 1	1944 − 1.02	1906	− 38	6 25	1274 + 1.00	1307	+ 33
22 51	1903 − 1.02	1866	− 37	8 12	1312 + 1.02	1367	+ 55
24 16	1866 − 1.01	1826	− 40	15 12	1472 + 1.05	1527	+ 55
25 39	1829 − 1.01	1796	− 33	16 20	1498 + 1.06	1547	+ 49
27 24	1784 − 1.00	1746	− 38	17 50	1533 + 1.06	1567	+ 34
30 24	1706 − 0.99	1686	− 20	19 4	1561 + 1.07	1607	+ 46
41 30	1438 − 0.93	1447	+ 9	19 9	1579 + 1.07	1627	+ 48
50 19	1236 − 0.86	1267	+ 31	20 34	1596 + 1.07	1637	+ 41
58 59	1054 − 0.75	1067	+ 13	22 4	1632 + 1.07	1667	+ 35
59 55	1035 − 0.74	1027	− 8	22 58	1654 + 1.08	1687	+ 33
23 1 40	1003 − 0.71	997	− 6	23 48	1674 + 1.08	1707	+ 33
2 36	988 − 0.70	947	− 41	25 6	1705 + 1.08	1727	+ 22
4 32	955 − 0.65	907	− 48	26 7	1730 + 1.08	1767	+ 37
9 2	878 − 0.54	847	− 31	26 45	1745 + 1.08	1787	+ 42
12 8	837 − 0.46	837	0	27 56	1774 + 1.09	1807	+ 33
13 22	824 − 0.42	827	+ 3	28 53	1798 + 1.09	1847	+ 49
19 14	758 − 0.22	747	− 11	30 21	1832 + 1.10	1886	+ 54
21 18	744 − 0.15	727	− 17	33 26	1907 + 1.10	$1966 - a_2$	+ 59
40 41	809 + 0.61	827	+ 18				

Combining the seven phases following the beginning with the corresponding ones preceding the end, we find $\delta\varepsilon = +34''$. The contacts alone give $\delta\varepsilon = +48''$. Giving the mean result from contacts the weight of two pairs of observations of phase, we have:—

$$\delta\varepsilon = +37''.$$

The other phases do not correspond to each other, and the agreement of the seven pairs we have used is so good that it does not seem necessary to discuss them.

Eclipse of 1666, *July* 1, *observed by* HEVELIUS.

Moon's apparent semi-diameter at beginning .	$944''.8$
Moon's apparent semi-diameter at end . . .	$949''.9$
Sun's apparent semi-diameter	$944''.6$

Local Mean Time.			Tabular Dist. of Centres.	Observed Distance.	Corr. to Tab. Dist.	Local Mean Time.			Tabular Dist. of Centres.	Observed Distance.	Corr. to Tab. Dist.
h	m	s	″	″	″	h	m	s	″	″	″
19	1	17	$1904 - 0.92\delta\varepsilon$	$1889-a_1$	$-15-a_1$	19	59	24	$614 - 0.15\delta\varepsilon$	585	− 29
	3	17	$1849 - 0.91$	1830	− 19	20	1	32	$602 - 0.07$	574	− 28
	6	10	$1770 - 0.90$	1772	+ 2		4	52	$587 + 0.09$	582	− 5
	8	17	$1711 - 0.90$	1713	+ 2		12	17	$617 + 0.39$	602	− 15
	10	37	$1649 - 0.89$	1654	+ 5		17	12	$667 + 0.57$	672	+ 5
	16	44	$1487 - 0.87$	1516 :	+ 29 :		23	17	$760 + 0.72$	751	− 9
	20	46	$1383 - 0.86$	1359	− 24		25	28	$798 + 0.76$	791	− 7
	23	37	$1311 - 0.84$	1300	− 11		33	55	$958 + 0.86$	966	+ 8
	27	22	$1216 - 0.82$	1201	− 15		36	1	$1001 + 0.88$	1027	+ 26
	29	30	$1163 - 0.80$	1155	− 8		42	12	$1134 + 0.92$	1145	+ 11
	33	40	$1065 - 0.77$	1064	− 1		49	6	$1285 + 0.95$	1322	+ 37
	37	37	$971 - 0.73$	946	− 25		51	59	$1354 + 0.95$	1381	+ 27
	42	42	$866 - 0.65$	829	− 37		53	19	$1385 + 0.96$	1422	+ 37
	43	52	$841 - 0.63$	799	− 42	20	56	44	$1466 + 0.96$	1461	− 5
	45	32	$813 - 0.60$	769	− 44	21	0	2	$1544 + 0.97$	1539	− 5
	48	17	$754 - 0.54$	739	− 15		4	11	$1644 + 0.98$	1676	+ 32
	49	53	$729 - 0.49$	711	− 18		5	22	$1673 + 0.98$	1716	+ 43
	51	47	$702 - 0.44$	684	− 18		7	25	$1721 + 0.98$	1761	+ 40
	54	12	$667 - 0.36$	632	− 35		9	7	$1761 + 0.98$	1815	+ 54
	57	2	$636 - 0.25$	602	− 34	21	12	40	$1849 + 0.99$	$1894-a_2$	$+45-a_2$

The contacts alone here give

$$\delta\varepsilon = +36''.$$

The four observations following first contact, combined with the corresponding four preceding last contact, give

$$\delta\varepsilon = +24.$$

The remaining observations in which the distance exceeded $900''$ give

$$\delta\varepsilon = +22'', \text{ or } \delta\varepsilon = +15'',$$

according as we include or reject the doubtful fifth observation of phase. The most probable result of all the observations is,

$$\delta\varepsilon = +25''.$$

Eclipse of 1676, *June* 10, *observed by* FLAMSTEED *at Greenwich.*

Moon's apparent semi-diameter at first observation .	894″.9
Moon's apparent semi-diameter at last observation .	896″.0
Sun's semi-diameter	945″.0

Mean Time.	Tabular Dist. of Centres.	Observed Dist. (by cusps).	Corr. to Tabular Dist.	
h m s	″	″	″	An examination of FLAMSTEED's observed semi-diameters of the sun shows that his micrometer measures of that element require a correction of $-7''.5$ for irradiation when the long telescope was used, and $-14''.3$ when the short one was used. These corrections have been applied in the column of observed distance when necessary.
19 56 16	$1751 - 0.66\,\delta\varepsilon$	1736	− 15	
20 2 4	$1655 - 0.64$	1639	− 16	
20 11 32	$1513 - 0.61$	1495	− 18	
20 38 19	$1244 - 0.22$	1282	+ 38	
		(by dir. meas.)		
20 16 29	$1447 - 0.55\,\delta\varepsilon$	1433	− 14	
20 18 58	$1416 - 0.53$	1411	− 5	
20 25 53	$1339 - 0.46$	1361	+ 22	
20 26 53	$1329 - 0.45$	1308	− 21	
20 33 4	$1277 - 0.38$	1281	+ 4	

At the time of the last measure of the distance of cusps, the eclipse was so far advanced that no reliable result could be obtained from the measure. Moreover, the discordance of the result is such as to indicate some mistake. The results from the other measures may fairly receive the respective weights 4, 3, and 2. The discordance of the third measure of phase is also so great as to give rise to a suspicion of some error in the record. The error is in fact between 30″ and 40″, whereas the probable error of FLAMSTEED's measures of the sun's semi-diameter does not in general exceed 3″ or 4″.

From the three first measures of distance of cusps with the weights assigned, we have,

$$\delta\varepsilon = +25''.0.$$

The sum of all the equations given by the phases is,

$$2.37\,\delta\varepsilon = +14''; \;\therefore\; \delta\varepsilon = +6''.$$

Rejecting the third measure, we shall have,

$$1.91\,\delta\varepsilon = +36; \;\therefore\; \delta\varepsilon = +19''.$$

The results from measures of distance of cusps near the beginning of an eclipse ought to be pretty accurate, while the discordance of the measures of phase renders their results uncertain. I therefore consider the most probable result from this eclipse to be,

$$\delta\varepsilon = +23'' \pm 6''.$$

Eclipse of 1684, *July* 12, *observed by* FLAMSTEED.

Moon's apparent semi-diameter at beginning . 946″.7
Moon's apparent semi-diameter at end . . . 943″.8
Sun's semi-diameter . . . . 944″.6

Mean time.	Tabular Dist. of Centres.	Observed Distance.	Corr. to Tabular Dist.	Mean time.	Tabular Dist. of Centres.	Observed Distance.	Corr. to Tabular Dist.
h m s	″	″	″	h m s	″	″	″
2 17 44	$1891 - 0.96\,\delta\varepsilon$	1862	− 29	3 39 35	$786 + 0.26\,\delta\varepsilon$	797	+ 11
28 39	$1654 - 0.94$	1655	+ 1	41 54	$811 + 0.33$	826	+ 15
42 59	$1352 - 0.90$	1334*	− 18	46 21	$865 + 0.43$	885	+ 20
47 56	$1252 - 0.87$	1241	− 11	50 39	$931 + 0.53$	944	+ 13
3 1 42	$997 - 0.75$	1005	+ 8	53 4	$973 + 0.57$	1003	+ 30
5 24	$937 - 0.70$	945	+ 8	59 17	$1087 + 0.66$	1121	+ 34
6 23	$923 - 0.69$	901*	− 22	4 2 19	$1148 + 0.70$	1180	+ 32
8 6	$899 - 0.66$	869*	− 30	5 5	$1205 + 0.72$	1240	+ 35
8 34	$891 - 0.65$	886	− 5	12 52	$1377 + 0.78$	1417	+ 40
14 2	$821 - 0.54$	827	+ 6	20 28	$1556 + 0.83$	1568†	+ 12
18 7	$781 - 0.45$	744*	− 37	20 40	$1561 + 0.83$	1594	+ 33
19 19	$770 - 0.42$	768	− 2	23 34	$1632 + 0.84$	1640†	+ 8
21 59	$754 - 0.33$	724*	− 30	25 56	$1690 + 0.85$	1741	+ 51
26 10	$736 - 0.19$	738	+ 2	26 52	$1714 + 0.85$	1736†	+ 22
30 13	$734 - 0.04$	738	+ 4	29 26	$1778 + 0.86$	1829	+ 51
36 27	$763 + 0.15$	768	+ 5	32 42	$1859 + 0.87$	1888	+ 29

* Micrometer measures of "pars lucida".

† From measures of cusps.

There is clearly a systematic error in the measures of phase, rendering it necessary to compare phases as nearly equal as possible on each side of the middle. This comparison gives the equations,

$$\begin{array}{llcll} 0.87\,\delta\varepsilon = & 9'', & \qquad & 1.32\,\delta\varepsilon = & 22'' \\ 1.08 & 25 & & 1.59 & 46 \\ 1.23 & 5 & & 1.78 & 43 \\ & & & 1.81 & 80. \end{array}$$

The solution of these equations gives

$$\delta\varepsilon = +\,25''.$$

The micrometer measures of "pars lucidae" before the middle of the eclipse give

$$\delta\varepsilon = +\,38''.$$

The three measures of cusps near the end give

$$\delta\varepsilon = +\,17''.$$

The most probable result from all the observations is

$$\delta\varepsilon = +\,24'' \pm 4''.$$

Eclipse of 1684, *July* 12, *observed by* La Hire *at Paris.*

Moon's apparent semi-diameter at beginning	$946''.7$
Moon's apparent semi-diameter at end	$943''.2$
Sun's semi-diameter	$944''.6$

Local Mean Time.	Tabular Distance of Centres.	Observed Distance.	Corr. to Tab. Dist.	Local Mean Time.	Tabular Distance of Centres.	Observed Distance.	Corr. to Tab. Dist.
h m s	″	″	″	h m s	″	″	″
2 30 23	$1934.8 - 0.98\,\delta\varepsilon$	1891.3	$-43 - a_1$	4 18 57	$1139.1 + 0.73\,\delta\varepsilon$	1173	+ 34
35 16	1828.1 − 0.97	1798	− 30	23 37	1244.4 + 0.77	1284	+ 40
41 6	1699.4 − 0.96	1673	− 26	29 57	1393.8 + 0.82	1417	+ 23
43 16	1652.0 − 0.96	1635	− 17	36 57	1566.5 + 0.84	1607	+ 40
49 16	1521.0 − 0.95	1497	− 24	43 37	1736.6 + 0.87	1778	+ 41
53 6	1438.6 − 0.94	1418	− 21	48 27	1862.8 + 0.89	1887.8	$+25 - a_2$
56 46	1359.9 − 0.93	1325	− 35			From meas. of cusps.	
3 3 6	1227.0 − 0.90	1196	− 31				
9 16	1102.3 − 0.87	1077	− 25	2 37 36	$1776.4 - 0.97\,\delta\varepsilon$	1707	− 69
15 46	979.1 − 0.81	975	− 4	45 6	1611.8 − 0.96	1587	− 25
23 6	852.9 − 0.71	841	− 12	54 26	1409.6 − 0.93	1394	− 16
26 26	803.2 − 0.65	784	− 19	59 36	1299.8 − 0.92	1301	+ 1
33 26	719.1 − 0.49	708	− 11	3 7 6	1145.8 − 0.88	1081	− 65
41 26	669.0 − 0.22	660	− 9	12 51	1032.6 − 0.83	1025	− 8
45 6	666.2 − 0.08	665	− 1	4 21 37	1198.4 + 0.76	1229	+ 31
56 7	736.4 + 0.32	765	+ 29	25 57	1298.4 + 0.79	1331	+ 33
4 1 47	811.6 + 0.47	825	+ 13	33 18	1475.4 + 0.83	1502	+ 27
5 27	871.0 + 0.55	879	+ 8	42 27	1706.6 + 0.87	1727	+ 20
10 7	956.0 + 0.63	975	+ 19				

Treating the contacts in the usual way, the result is,

$$\delta\varepsilon = +31''.$$

The sum of the eleven equations from phases following first contact in which the coefficient of $\delta\varepsilon$ exceeds 0.5 is,

$$9.65\,\delta\varepsilon = 244''; \therefore \delta\varepsilon = +25''.$$

The sum of seven phases preceding last contact,

$$5.21\,\delta\varepsilon = 205''; \therefore \delta\varepsilon = +40''.$$

The measures of cusps near beginning, giving double weight when $D > 1600''$, give the result,

$$\delta\varepsilon = +37''.$$

Those near end give

$$\delta\varepsilon = +32''.$$

The most probable mean result is,

$$\delta\varepsilon = +32'' \pm 2''.$$

Eclipse of 1687, *May* 11, *observed by* FLAMSTEED.

Moon's apparent semi-diameter at beginning .	$955''.4$
Moon's apparent semi-diameter at end . . .	$954''.3$
Sun's apparent semi-diameter	$944''.6$

Mean Time.	Tabular Distance of Centres.	Observed Distance.	Mean Time.	Tabular Distance of Centres.	Observed Distance.
h m s	$''$	$''$	h m s	$''$	$''$
1 13 3	1905	. .	1 38 43	$1812 + 0.11\,\delta\varepsilon + 0.99\,i\delta\theta$	1804.8
15 41	$1885 - 0.18\,\delta\varepsilon + 0.98\,i\delta\theta$	1871.2	40 49	$1813 + 0.13 \quad + 0.99$	1807.4
17 9	$1877 - 0.17 \quad + 0.98$	1859.7	44 47	$1820 + 0.19 \quad + 0.98$	1816.7
22 5	$1849 - 0.11 \quad + 0.99$	1834.2	48 3	$1830 + 0.23 \quad + 0.97$	1832.0
28 31	$1825 - 0.02 \quad + 0.99$	1816.7	54 1	$1855 + 0.30 \quad + 0.95$	1858.9
31 53	$1817 \quad 0.00 \quad + 1.00$	1810.5	55 43	$1864 + 0.32 \quad + 0.95$	1870.3
35 27	$1812 + 0.07 \quad + 0.99$	1804.9	2 0 13	$1892 + 0.38 \quad + 0.93$	$1898.9-a_2$
38 3	$1812 + 0.10 \quad + 0.99$	1804.8	0 17	$1893 + 0.38 \quad + 0.93$	$1898.9-a_2$

This eclipse and the next one were originally computed with the hope that they would give a valuable correction to the longitude of the moon's node. They are too small to be of any use for determining the longitude. But it seems that in the two eclipses a change in the node will have the same effect on the distance of centres, and the systematic errors in the observations may be such that no good result can be obtained. I therefore make no use of the eclipses, but present the data for the use of any investigator who may choose to discuss them.

Eclipse of 1689, *September* 13, *observed by* FLAMSTEED.

Moon's apparent semi-diameter at beginning .	$923''.0$
Moon's apparent semi-diameter at end . . .	$920''.4$
Sun's apparent semi-diameter	$955''.8$

Mean Time.	Tabular Distance of Centres.	Observed Distance.	Mean Time.	Tabular Distance of Centres.	Observed Distance.
h m s	$''$	$''$	h m s	$''$	$''$
3 24 57	$1884 - 0.34\,\delta\varepsilon + 0.90\,i\delta\theta$	$1843.4-a_1$	4 8 57	$1693 + 0.26\,\delta\varepsilon + 0.93\,i\delta\theta$	1701.3
37 7	$1762 - 0.20 \quad + 0.94$	1764.0	11 35	$1706 + 0.30 \quad + 0.92$	1712.5
40 17	$1736 - 0.16 \quad + 0.95$	1727.5	15 39	$1732 + 0.34 \quad + 0.90$	1740.1
44 43	$1708 - 0.09 \quad + 0.96$	1703.7	18 57	$1759 + 0.39 \quad + 0.88$	1763.1
48 37	$1691 - 0.04 \quad + 0.96$	1687.9	21 39	$1784 + 0.43 \quad + 0.86$	1792.9
53 51	$1676 + 0.04 \quad + 0.96$	1676.1	24 21	$1810 + 0.45 \quad + 0.85$	1818.1
4 3 57	$1676 + 0.19 \quad + 0.95$	1674.3	28 57	$1863 + 0.49 \quad + 0.82$	$1876.2-a_2$
7 5	$1686 + 0.24 \quad + 0.94$	1685.0	29 3	$1864 + 0.50 \quad + 0.81$	$1876.2-a_2$

Eclipse of 1699, *September* 22, *observed by* La Hire *at Paris.*

Moon's semi-diameter at beginning	.	963″.5
Moon's semi-diameter at end	. . .	966″.5
Sun's semi-diameter	. . . . . .	958″.4

Paris Mean Time.	Tabular Distance of Centres.	Observed Distance.	Corr. to Tab. Dist.	Paris Mean Time.	Tabular Distance of Centres.	Observed Distance.	Corr. to Tab. Dist.
h m s	″	″	″	h m s	″	″	″
20 7 9	$1936.2-1.01\,\delta\varepsilon$	1921.9	$-14.3-a_1$	21 22 48	$388.4+0.26\,\delta\varepsilon$	406.3	+17.9
9 34	1872.3−1.01	1842.1	−30.2	29 44	450.2+0.63	486.3	+36.1
12 19	1800.0−1.01	1762.3	−37.7	35 30	538.9+0.80	566.2	+27.3
16 10	1699.3−1.00	1682.5	−16.8	39 28	611.4+0.88	646.1	+34.7
19 21	1616.4−1.00	1602.7	−13.7	43 18	687.2+0.91	726.0	+38.8
22 35	1532.9−1.00	1522.9	−10.0	49 33	818.3+0.97	885.9	+67.6
24 37	1480.7−0.99	1443.2	−37.5	54 7	918.0+0.99	965.9	+47.9
28 10	1390.3−0.98	1363.4	−26.9	58 4	1005.4+1.00	1045.8	+40.4
30 57	1320.1−0.98	1283.6	−36.5	22 2 56	1115.2+1.01	1125.7	+10.5
33 55	1245.4−0.97	1203.9	−41.5	6 38	1199.3+1.02	1205.6	+ 6.3
37 7	1166.0−0.96	1124.1	−41.9	9 46	1270.9+1.03	1285.5	+14.6
40 46	1076.7−0.95	1044.3	−32.4	12 57	1344.4+1.03	1365.5	+21.1
44 19	991.4−0.93	964.6	−26.8	16 56	1435.3+1.03	1445.4	+10.1
47 53	906.7−0.91	884.8	−21.9	29 55	1504.0+1.04	1525.3	+21.3
51 14	829.1−0.89	805.0	−24.1	24 17	1604.8+1.04	1605.3	+ 0.5
55 11	740.6−0.85	725.2	−15.4	27 44	1684.4+1.04	1685.2	+ 0.8
59 2	658.2−0.80	645.5	−12.7	31 10	1763.7+1.04	1765.1	+ 1.4
21 3 3	578.0−0.72	565.7	−12.3	33 48	1824.6+1.04	1845.0	+20.4
7 57	491.9−0.59	486.0	− 5.9	37 9	1901.8+1.04	1924.9	$+23.1-a_2$
15 17	402.5−0.23	406.2	+ 3.7				

The contacts give

$$\delta\varepsilon = +\,20''.2.$$

The 16 measures of phase following first contact,

$$15.23\ \delta\varepsilon = 426''; \ \therefore \ \delta\varepsilon = +\,27''.9.$$

The 16 measures of phase preceding last contact,

$$15.87\ \delta\varepsilon = 364''; \ \therefore \ \delta\varepsilon = +\,22''.9.$$

The mean result is,

$$\delta\varepsilon = +\,24''.8 \pm 2''.$$

Eclipse of 1706, *May* 11, *observed by* LA HIRE *at Paris.*

Moon's apparent semi-diameter at beginning .	$1003''.0$
Moon's apparent semi-diameter at end . . .	$1006''.3$
Sun's apparent semi-diameter	$949''.1$

Paris Mean Time.	Tabular Distance of Centres.	Observed Distance.	Corr. to Tab. Dist.	Paris Mean Time.	Tabular Distance of Centres.	Observed Distance.	Corr. to Tab. Dist.
h *m* *s*	″	″	″	*h* *m* *s*	″	″	″
20 21 47	$1959.0 - 1.08\,\delta\varepsilon$	1932:	− 27	21 50 8	$670.4 + 1.12\,\delta\varepsilon$	702	+ 32
44 37	1275.0 − 1.06	1254	− 21	51 23	703.6 + 1.12	740	+ 36
48 37	1157.8 − 1.05	1124	− 34	52 48	741.4 + 1.12	778	+ 37
51 37	1070.4 − 1.05	1048	− 22	54 23	783.9 + 1.12	822	+ 38
54 12	995.5 − 1.04	972	− 24	56 8	830.4 + 1.13	860	+ 30
56 58	915.9 − 1.03	896	− 20	57 28	866.9 + 1.13	897	+ 30
57 48	892.1 − 1.03	739	(−153)	59 3	909.3 + 1.13	936	+ 27
21 3 53	719.9 − 0.99	701	− 19	22 0 23	945.2 + 1.13	974	+ 29
5 18	680.5 − 0.98	663	− 27	1 53	985.7 + 1.13	1012	+ 26
6 33	645.9 − 0.97	625	− 21	3 23	1026.2 + 1.13	1050	+ 24
7 48	611.3 − 0.96	587	− 24	5 3	1071.4 + 1.13	1088	+ 17
9 18	570.4 − 0.95	549	− 21	6 23	1107.3 + 1.13	1125	+ 18
10 48	530.4 − 0.93	511	− 19	7 58	1150.3 + 1.13	1163	+ 13
12 10	494.3 − 0.91	473	− 21	9 28	1190.9 + 1.13	1202	+ 11
13 48	452.0 − 0.88	435	− 17	10 38	1222.5 + 1.13	1240	+ 18
15 11	417.3 − 0.85	398	− 19	11 33	1247.2 + 1.13	1278	+ 31
17 3	372.3 − 0.79	360	− 12	12 48	1281.1 + 1.13	1315	+ 34
18 43	333.9 − 0.72	322	− 12	14 33	1328.4 + 1.13	1354	+ 26
20 43	292.2 − 0.62	284	− 8	15 46	1361.3 + 1.13	1392	+ 31
22 43	256.6 − 0.44	246	− 11	17 28	1407.3 + 1.13	1430	+ 23
27 38	214.0 + 0.20	221	+ 7	18 53	1445.6 + 1.13	1468	+ 22
30 53	233.0 + 0.62	246	+ 13	21 53	1526.7 + 1.13	1544	+ 17
32 53	260.8 + 0.80	284	+ 23	23 3	1558.1 + 1.13	1587	+ 29
35 4	300.5 + 0.91	322	+ 22	24 30	1597.0 + 1.13	1625	+ 28
36 38	333.2 + 0.97	360	+ 27	25 48	1632.0 + 1.13	1663	+ 31
38 16	369.8 + 1.01	398	+ 28	26 58	1663.4 + 1.13	1701	+ 38
39 38	401.7 + 1.06	436	+ 34	28 10	1695.7 + 1.13	1739	+ 43
41 18	442.3 + 1.06	474	+ 32	29 43	1737.3 + 1.13	1777	+ 40
42 58	483.8 + 1.07	512	+ 28	31 14	1778.1 + 1.13	1815	+ 37
44 8	513.6 + 1.08	550	+ 36	32 43	1817.8 + 1.13	1853	+ 35
45 43	554.4 + 1.08	588	+ 34	34 18	1860.2 + 1.13	1891	+ 31
47 3	589.1 + 1.10	626	+ 37	37 2	1933.5 + 1.13	1955	$+ 22 - a_2$
48 38	630.8 + 1.11	664	+ 33				

As there is a gap of 23 minutes in the observations after the beginning, we have, during this interval, no observations to compare with the corresponding ones near the end. The sum of the 14 equations after the beginning is,

$$13.65\,\delta\varepsilon = 309''; \;\therefore\; \delta\varepsilon = +22''.6$$

The sum of 24 equations most nearly corresponding to them after the middle is,

$$26.45\,\delta\varepsilon = 675''; \;\therefore\; \delta\varepsilon = +25''.5.$$

The remaining phases near the end which have none to correspond to them near the beginning would give

$$\delta\varepsilon = +27''.4.$$

I think this result should be rejected, and that we should take, as the result of the observation,

$$\delta\varepsilon = + 24''.1 \pm 2''.$$

Eclipse of 1715, *May* 2, *observed by the* Messrs. La Hire *at Paris.*

Moon's apparent semi-diameter at beginning . 1007″.5
Moon's apparent semi-diameter at end . . . 1011″.2
Sun's apparent semi-diameter . . . . 951″.2

La Hire, the father, using new micrometer.				La Hire, the son, using image on screen.			
Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.	Corr. to Tabular Dist.	Local Mean Time.	Tabular Dist. of Centres.	Observed Distance.	Corr. to Tabular Dist.
h m s	″	″	″	h m s	″	″	″
20 9 0	1971.6 − 1.15 $\delta\varepsilon$	1958.7 − a_1	− 12.9	20 9 0	1971.6 − 1.15 $\delta\varepsilon$	1958.7 − a_1	− 12.9
14 9	1813.9 − 1.15	1800.3	− 13.6	14 6	1810.4 − 1.15	1800.3	− 10.1
19 34	1649.5 − 1.15	1641.9	− 7.6	16 56	1729.2 − 1.15	1721.1	− 8.1
24 38	1496.8 − 1.15	1483.5	− 13.3	19 26	1653 5 − 1.15	1641.9	− 11.6
29 9	1361.7 − 1.15	1325.1	− 36.6	21 52	1579.9 − 1.15	1562.7	− 17.2
33 4	1245.4 − 1.15	1245.9	+ 0.5	24 40	1495.7 − 1.15	1483.5	− 12.2
38 20	1090.0 − 1.15	1087.6	− 2.4	27 33	1409.5 − 1.15	1404.3	− 5.2
40 47	1018.0 − 1.15	1008.5	− 9.5	30 11	1330.8 − 1.15	1325.1	− 5.7
43 29	939.2 − 1.15	929.2	− 10.0	33 1	1246.8 − 1.15	1245.9	− 0.9
46 0	866.3 − 1.15	850.0	− 16.3	35 19	1178.8 − 1.15	1166.7	− 12.1
48 50	784.6 − 1.15	770.9	− 13.7	37 58	1100.6 − 1.15	1087.6	− 13.0
51 40	703.7 − 1.14	691.7	− 12.0	40 56	1013.4 − 1.15	1008.5	− 4.9
54 14	631.1 − 1.13	612.5	− 18.6	45 47	872.5 − 1.15	850.0	− 22.5
56 48	559.9 − 1.12	533.3	− 26.6	49 7	776.4 − 1.15	770.9	− 5.5
21 0 12	467.0 − 1.11	454.1	− 12.9	52 14	687.6 − 1.14	691.7	+ 4.1
3 16	386.1 − 1.06	374.9	− 11.2	21 3 50	371.6 − 1.05	374.9	+ 3.3
6 24	308.1 − 0.90	295.7	− 12.4	6 38	302.6 − 0.87	295.7	− 6.9
12 4	197.1 − 0.58	208.9	+ 11.8	11 11	209.9 − 0.69	216.7	+ 6.8
18 44	201.6 + 0.50	190.3	− 11.3	15 37	175.4 + 0.02	216.8	+ 41.4
22 44	276.3 + 0.81	296.0	+ 19.7	22 10	264.0 + 0.78	296.0	+ 32.0
25 44	344.7 + 0.92	375.3	+ 30.6	25 51	349.0 + 0.92	375.4	+ 26.4
32 15	512.0 + 1.03	533.9	+ 21.9	28 59	427.5 + 0.99	454.8	+ 27.3
35 26	596.7 + 1.04	613.2	+ 16.5	32 0	506.2 + 1.03	534.1	+ 27.9
39 8	696.3 + 1.07	692.5	− 3.8	35 24	596.3 + 1.04	613.4	+ 17.1
41 30	760.2 + 1.08	771.8	+ 11.6	38 31	680.1 + 1.06	692.8	+ 12.7
44 54	852.5 + 1.09	851.2	− 1.3	41 14	753.4 + 1.08	772.1	+ 18.7
47 34	925.2 + 1.10	930.6	+ 5.4	44 32	842.8 + 1.09	851.5	+ 8.7
50 44	1011.1 + 1.10	1010.2	− 0.9	47 36	926.1 + 1.10	930.9	+ 4.8
53 35	1088.5 + 1.10	1089.7	+ 1.2	50 24	1002.1 + 1.10	1010.3	+ 8.2
56 6	1157.1 + 1.11	1169.2	+ 12.1	53 27	1084.9 + 1.10	1089.6	+ 4.7
58 54	1233.0 + 1.11	1248.5	+ 15.5	56 47	1174.6 + 1.11	1169.0	− 5.6
22 5 16	1404.9 + 1.12	1407.0	+ 2.1	59 34	1251.1 + 1.11	1248.3	− 2.8
8 58	1504.5 + 1.12	1486.8	− 17.7	22 2 44	1336.8 + 1.12	1327.7	− 9.1
11 56	1566.4 + 1.12	1566.0	− 0.4	5 36	1413.9 + 1.12	1407.0	− 6.9
13 53	1636.7 + 1.12	1645.1	+ 8.4	8 45	1498.7 + 1.12	1486.4	− 12.3
19 12	1779.2 + 1.12	1803.8	+ 24.6	14 12	1645.1 + 1.12	1645.1	0.0
22 17	1861.6 + 1.13	1883.1	+ 21.6	19 14	1780.0 + 1.12	1803.8	+ 23.8
25 31	1947.8 + 1.13	1962.4 − a_2	+ 14.7	25 29	1946.9 + 1.13	1962.4 − a_2	+ 15.5

The 16 measures of the father, following first contact, give	$\delta\varepsilon = +12''.0$
His 18 measures preceding last contact	$\delta\varepsilon = +\ 8''.8$
The 16 observations of the son following first contact .	$\delta\varepsilon = +\ 7''.1$
His 18 observations preceding last contact	$\delta\varepsilon = +\ 9''.2$
Contacts observed by the father	$\delta\varepsilon = +14''.1$
Contacts observed by the son	$\delta\varepsilon = +14''.6.$

The contacts noted by the two observers agree so well that there is a suspicion of their not being independent. The correspondence between the considerable errors of the three phases preceding last contacts might give rise to a similar suspicion respecting the observations of phase, but this correspondence does not seem to extend through the observations.

Giving the combined results from measures of phase four times the weight of those from contacts, we shall have

$$\delta\varepsilon = +10''.3 \pm 1''.5.$$

Eclipse of 1715, *May* 2, *observed by* CASSINI *at Marly.*

$\phi = 48^\circ\ 51'.7$; $\lambda = 8^m\ 24^s$ east from Greenwich.

The local mean times are taken without correction from the Memoirs of the Academy for 1715, pp. 83, 84, applying − $3^m\ 22^s$ for equation of time.

Local Mean Time.	Tabular Distance of Centres.	Observed Distance.	Corr. to Tab. Dist.	Local Mean Time.	Tabular Distance of Centres.	Observed Distance.	Corr. to Tab. Dist.
h m s	″	″	″	h m s	″	″	″
20 7 40	$1976.4 - 1.15\delta\varepsilon$	$1959-a_1$	$-17-a_1$	21 14 8	169.4	177	+ 8
12 18	1835.2 − 1.15	1800	− 35	16 8	180.2	177	− 3
17 6	1688.7 − 1.15	1642	− 47	18 38	214.8	218	+ 3
22 57	1512.1 − 1.15	1484	− 28	24 53	$349.0 + 0.92\delta\varepsilon$	376	+ 27
26 2	1419.8 − 1.15	1405	− 15	30 55	506.8 + 1.03	535	+ 28
29 8	1327.4 − 1.15	1326	− 1	37 54	693.2 + 1.07	693	0
34 15	1175.4 − 1.15	1167	− 8	43 42	849.8 + 1.09	852	+ 2
39 44	1014.5 − 1.15	1009	− 6	55 38	1174.5 + 1.11	1169	− 6
45 28	847.9 − 1.15	850	+ 2	22 8 8	1512.7 + 1.12	1486	− 27
52 2	658.5 − 1.14	692	+ 34	13 38	1660.7 + 1.12	1645	− 16
56 49	526.5 − 1.13	534	+ 7	19 8	1808.3 + 1.12	1803	− 5
21 2 48	366.6 − 1.06	375	+ 8	24 28	1951.7 + 1.13	$1962-a_2$	$+10-a_2$
9 18	219.0	217	− 2				

The systematic errors in the estimates of phases are so strongly marked that only corresponding phases can be combined. There are in all eight pairs of such observations, the sum of which give the equation

$$17.66\ \delta\varepsilon = +70''; \therefore \delta\varepsilon = +4''.$$

The observations of contact alone give

$$\delta\varepsilon = +12''.$$

Owing to the extreme irregularity of the observations of phase, I think the pair of contacts are entitled to as much weight as the whole eight pairs of observations of phase. The result of these observations will then be

$$\delta\varepsilon = +8'' \pm 4''.$$

Eclipse of the Sun, 1715, *May* 2–3, *as observed in England.*

This eclipse was total in England, where a great number of observations were made, the results of which were published in the *Philosophical Transactions.* Unfortunately, in the large majority of cases we have no data whatever for judging of the accuracy with which the time was determined, and the observers are mostly unknown as astronomers. The well-known observers were FLAMSTEED, HALLEY, POUND, and COTES. The latter was so "oppressed by too much company" that he could not observe the first two phases; it may therefore be feared that the same circumstances prevented an exact determination of clock-error. HALLEY, notwithstanding his scientific merits in some directions, seems to have been extremely unskilled in every branch of the art of practical astronomy. POUND made many observations, but there is no way of ascertaining how well his time was determined. FLAMSTEED was the best of the observers, but, unfortunately, his data for clock-error are far from being as certain as is desirable. These uncertainties are especially to be regretted, because the observed times of beginning and end of a total eclipse are not subject to the uncertainties which affect observations of the other phases.

There was, however, one class of determinations made during this eclipse with an accuracy which hardly leaves anything to be desired, and for which we are probably indebted to HALLEY, namely, the limits of the path of totality. We have here the most valuable single datum which astronomy possesses for determining the motion of the moon's node; it is, therefore, very surprising that it should have passed entirely unnoticed and unused.

In discussing this eclipse, we shall begin with the English observations of the times of the total phases, rejecting those of the beginning and end as uncertain in comparison. Last of all, we shall discuss the results of the shadow-limits.

Observations of FLAMSTEED.—Everything accessible respecting these observations is found in the *Historia Coelestis*, vol. ii, p. 551. I have examined the original manuscripts at Greenwich, but find nothing but what is printed. Some light respecting the observations may perhaps be gathered from a letter of FLAMSTEED, printed by BAILY in his *Account of the Rev^{d}. John Flamsteed*, pp. 315–316. The following are the essential observations, giving times of transit over mural quadrant, and phases of eclipse:—

Date. (Old style.)	Clock Time.			True Apparent Time.			Object.
1715.	*h*	*m*	*s*	*h*	*m*	*s*	
Apr. 21	11	1	7	.	.	.	τ Bootis.
		8	31	.	.	.	η Bootis.
		24	23	.	.	.	κ Virginis.
		30	3	.	.	.	α Bootis.
	20	11	45	20	5	54	Initium Ecl. ☉.
	21	14	41	21	9	0	Totalis obscuratis.
		17	52		12	12	Lux prima.
		19	1		13	21	Venus transit.
	22	25	32	22	19	51	Finis.
26	11	11	28	.	.	.	

The discrepancy of ten seconds in the clock-correction for beginning I cannot certainly explain; it exists in the MS., and may be a correction for phase.

To deduce the clock-corrections from the star-transits, we must know the deviation of the quadrant from the meridian. In KRUEGER's doctoral dissertation, *De Ascensionibus Rectis a Flamsteedio Quadrantis Muralis ope observatis*, Bonn, 1854, is found a discussion of the errors of the quadrant in 1690, in which the following values of *m* are quoted from a dissertation by ARGELANDER:—

1690, aetate vernali	$m = + 26^{s}.7$
1690, aestate . .	$+ 28^{s}.9$
1699, auctumno .	$+ 35^{s}.8$
1713, mense Junio	$+ 69^{s}.4$.

These are the corrections to reduce the observed time of transit of an equatorial star to the true meridian. Supposing the change to go on, the correction in 1715 would have been about $+ 73^{s}$. Neglecting, at first, the polar deviation from the meridian, we have the following clock-corrections from the star-transits:—

Date.	Star.	R. A. as computed.			Computed Mean Time of Transit over True Mer.			Clock-corr. minus Deviation.		Dec. of Star.
		h	*m*	*s*	*h*	*m*	*s*	*m*	*s*	°
May 2	τ Bootis .	13	33	44	10	52	57	− 8	10	+ 18
	η Bootis .		41	8	11	0	20	− 8	11	+ 19
	κ Virginis .		57	46		16	55	− 7	28	− 9
	α Bootis .	14	2	41		21	49	− 8	14	+ 20
May 7	α Bootis .		2	41		2	9	− 9	19	+ 20

From this it may be concluded that the clock-correction for an equatorial star on May 2 at $11^{h}.1$ would have been	$- 7^{m}\ 42^{s}$
Applying ARGELANDER's *m* negatively	$- 1^{m}\ 13^{s}$
Clock-error at $11^{h}.1$	$- 8^{m}\ 55^{s}$
Change in 10 hours, daily rate being $- 13^{s}$	$- \quad 5^{s}$
Clock-correction for middle of eclipse	$- 9^{m}\ 0^{s}$.

Another determination of the error of the quadrant has been attempted, as follows:—On 1713, June 16–27, the clock-time of transit of the sun over the true meridian, as derived from morning and afternoon altitudes, was $0^{h}\ 7^{m}\ 11^{s}$, while the transit over the quadrant occurred at $0^{h}\ 6^{m}\ 30^{s}$, showing a correction of $+ 41^{s}$. Again, on 1718, August 29–September 9, the true transit was found in the same way to be at $0^{h}\ 3^{m}\ 5^{s}$ clock-time, while the transit over the quadrant was marked at $0^{h}\ 1^{m}\ 54^{s}$. We, therefore, have, for the correction to the quadrant,

1713, at declination $+ 23°$: $c = + 0^{m}\ 41^{s}$.
1718, at declination $+ \ 5°$: $c = + 1^{m}\ 11^{s}$.

The mean declination of the three northern stars observed on May 2 was $+ 19°$, and the uncorrected clock-correction was $- 8^{m}\ 12^{s}$. The correction of quadrant interpolated to this declination is 48^s, making for the true clock-error $-9^m\ 0^s$. If we had taken all four stars, we should have had: mean clock-correction, $-8^m\ 1^s$; mean declination, $+12^\circ$; correction for quadrant, 59^s; and the resulting clock-correction would still be $-9^m\ 0^s$. Correcting, as before, for rate, the correction for the time of the eclipse is $-9^m\ 5^s$.

The correction to apparent time applied by FLAMSTEED is $-5^m\ 40^s$, and the equation of time is $-3^m\ 23^s$, so that the correction actually used by FLAMSTEED, of the derivation of which we have no knowledge, is $-9^m\ 3^s$. We have, then, the three following results for the correction to FLAMSTEED's clock on mean time at the moment of total eclipse:—

Using ARGELANDER's *m*	$-9^m\ 0^s$.
From an independent discussion	$-9^m\ 5^s$.
FLAMSTEED actually used	$-9^m\ 3^s$.

The value of ARGELANDER's *m* resting on an "extrapolation", and its applicability being questionable, not much weight can be given to the first result. I think, therefore, that we may put the clock-correction on mean time at $-9^m\ 4^s$, and that the error can then hardly exceed 3 or 4 seconds.

Observations by HALLEY.—These were made at the rooms of the Royal Society in Crane Court, Fleet Street, London. A re-reduction of his altitudes gives results scarcely differing from those he obtains. The correction of his clock on mean time is $-3^m\ 38^s$. I have assumed his position to be,

$$\varphi = 51^\circ\ 31'$$
$$\lambda = 0^m\ 25^s \text{ west.}$$

The longitude may be some seconds in error, but it would be a useless refinement to discuss it in connection with such observations.

Observations by POUND.—Here we have nothing but apparent times, and can do nothing but apply $-3^m\ 22^s$, the equation of time, to his results. POUND's position was,

$$\varphi = 51^\circ\ 34'$$
$$\lambda = 0^m\ 8^s \text{ east.}$$

Elements derived from Theory.—The Besselian elements of this eclipse are as follows:—

	h *m*	*h* *m*	*h* *m*	*h* *m*	*h* *m*
Greenwich Mean Times .	19 12	20 24	21 36	22 48	24 0
Values of *x*	−1.52076	−0.83934	0.15752	+0.52450	+1.20650
Hourly variation . . .	+0.56762	0.56802	0.56824	0.56810	0.56760
Values of *y*	+0.39727	+0.54586	+0.69408	+0.84170	+0.98870
Hourly variation . . .	+0.12388	0.12367	0.12327	0.12276	0.12223
Log sin *d*	9.42702	9.42742	9.42781	9.42821	9.42860
Radius of penumbra . .	0.53322	0.53333	0.53341	0.53345	0.53343
Radius of shadow . . .	0.01299	0.01288	0.01280	0.01276	0.01268
	° ′ ″	° ′ ″	° ′ ″	° ′ ″	° ′ ″
μ	288 50 17.7	306 50 29.4	324 50 40.8	342 50 52.4	0 51 3.9

The notation here used is that of § 7. The radii of the penumbra and shadow are those which correspond to the fundamental plane of reference, passing through the centre of the earth perpendicular to the axis of the shadow. The value of μ is that of μ' corresponding to the meridian of Greenwich.

From these data we obtain the following observed and computed local mean times:—

Place.	Observer.	Total Phase.	Local Mean Time obs.	Local Mean Time comp.	Correction.
			h m s	m s	s
Greenwich .	Flamsteed .	Beginning .	21 5 37	6 34	− 57
		End . . .	21 8 48	9 32	− 44
London . .	Halley . .	Beginning .	21 5 39	6 1	− 22
		End . . .	21 9 2	9 12	− 10
Wanstead .	Pound . .	Beginning .	21 6 6	6 48	− 42
		End . . .	21 9 26	9 52	− 26

At the general mean of these times, and for the position of Greenwich, we have, very nearly, for the change in the time of the phase produced by a change of 1″ in the longitude, λ, and the latitude, β, of the moon,

$$\text{Beginning of totality; } \delta t_1 = -\ 2.13\ \delta\lambda + 1.52\ \delta\beta$$
$$\text{End of totality; } \delta t_2 = -\ 2\ 04\ \delta\lambda - 2.04\ \delta\beta.$$

To make use of these quantities, we must express the correction of the moon's true longitude and latitude in terms of that of her mean longitude and longitude of the node. We find, from the formulæ already given,

$$\delta\lambda = \quad 1.14\ \delta\varepsilon$$
$$\delta\beta = -\,0.100\ \delta\varepsilon + 0.088\ \delta\theta,$$

which expressions are to be substituted in the preceding equations of condition.

We have now to combine the observations. Their remarkable discordance renders the final result greatly dependent on the relative weights assigned, and these are necessarily a matter of judgment. The most widely discordant ones are those which we should suppose, from the data before us, to have been the best, namely, HALLEY's and FLAMSTEED's. Altogether, I think, the most probable result will be obtained by giving HALLEY and POUND the weight 1, and FLAMSTEED weight 2. At the same time, I confess, that my judgment may be influenced in this decision by the entirely improbable correction to the tabular times which is indicated by FLAMSTEED's observations, and that but for this I might assign a greater relative weight to the latter. On the other hand, were it not for the equally great deviation of HALLEY's observations from probability in the opposite direction, I might assign him a greater weight than POUND, and the result would then be but little altered. I shall, therefore, adhere to the above weights. This combination will give,

$$\text{Mean correction to beginning} \quad . \; . \; . \; . \; . \quad \delta t_1 = -\ 44^s$$
$$\text{Mean correction to end} \quad . \; . \; . \; . \; . \; . \; . \; . \quad \delta t_2 = -\ 31^s.$$

By substituting the values of δt, $\delta\lambda$, etc., in the equations of condition, they become,

$$2.58\ \delta\varepsilon - 2.0\ \delta L - 0.134\ \delta\theta = 44$$
$$1.76\ \delta\varepsilon - 2.0\ \delta L + 0.179\ \delta\theta = 31.$$

Putting δL, the correction to the sun's longitude, equal to zero, we derive from these equations

$$\delta\varepsilon = + 16''.2 \pm 2''.5$$
$$\delta\theta = - 20''.$$

The correction to θ will be obtained so much more accurately from other observations that we need not consider it here.

§ 15.

DISCUSSION OF DEVIATIONS IN THE MOON'S MEAN MOTION AS INDICATED BY THE PRECEDING OBSERVATIONS.

We now employ the preceding results for the study of the principal problem in view as the object of these researches. If we suppose no deviation in the mean motion of the moon except that which is due to the gravitation of other bodies of our system, this mean motion would be constant with the exception of a secular acceleration, the amount of which has been accurately fixed by theory. It is, however, well known that the secular acceleration given by observation is not the same as that deduced from theory, and astronomers have generally been agreed that the apparent difference may be due to a retardation of the earth's axial rotation. Thus, the apparent secular acceleration will be made up of two parts,—the one a real acceleration; the other an apparent one, due to the change in our measure of time.

But when we study the problem more closely, we shall find that the hypothesis of a constant tidal retardation fails to account for the observed mean motion of the moon, and that we must either suppose this retardation variable, sometimes even becoming an acceleration, or we must suppose the mean motion of the moon subject to changes which have not yet been accounted for. Let as now inquire what deviations of the moon's mean motion remain unaccounted for. For this purpose, we collect from the two preceding sections the following system of residual corrections, obtained from the observations of eclipses and occultations made since the invention of the telescope. We begin with individual results from each eclipse and from groups of occultations. It may once more be remarked that the probable errors here assigned are, for the most part, mere estimates, founded on a consideration of all the attendant circumstances. Some such estimate is absolutely necessary for the subsequent combination of the observations; and, as there are no data for the rigorous computation of probable errors, we are necessarily left in part to the exercise of our judgment.

Individual Corrections to the Mean Longitude of the Moon in HANSEN'S *Tables, with the Sources whence derived.*

1621.4, $\delta\varepsilon =$	$+ 78''$	$\pm 14''$	GASSENDUS, beginning and end of eclipse.
1630.4	$+ 35$	± 25	GASSENDUS, beginning of eclipse.
1633.3	$+ 53$	± 13	GASSENDUS, eclipse ⊙, phases.
1635.7	$+ 57$	± 9	BULLIALDUS and GASSENDUS, 13 occultations.
1639.4	$+ 34$	± 11	Eclipse ⊙, by GASCOIGNE.
1639.4	$+ 23$	± 9	Eclipse ⊙, by GASSENDUS.
1639.4	$+ 27$	± 5	Eclipse ⊙, by HORROX.

1639.4, $\delta\varepsilon =$	$-27''$	$\pm$ (?)″	Eclipse ⊙, by **Hevelius**.
1645.2	+ 34	± 10	4 phases of occultations, by **Hevelius**.
1645.6	+ 51	± 8	Eclipse ⊙, by **Hevelius**.
1652.3	+ 38	± 10	Eclipse ⊙, by **Hevelius**.
1654.6	+ 31	± 8	Eclipse ⊙, by **Walterius**.
1661.2	+ 37	± 6	Eclipse ⊙, by **Hevelius**.
1662.0	+ 38	± 5	Occultations, by **Hevelius**.
1666.5	+ 25	± 10	Eclipse ⊙, by **Hevelius**.
1673.9	+ 39	± 4	Occultations, by **Hevelius**.
1676.4	+ 23	± 6	Eclipse ⊙, by **Flamsteed**.
1680.0	+ 31	± 5	Occultations, by **Hevelius**.
1680.0	+ 29.4	± 1.0	Occultations by **Flamsteed** and the Paris astronomers.
1684.5	+ 24	± 4	Eclipse ⊙, by **Flamsteed**.
1684.5	+ 32	± 2	Eclipse ⊙, by **La Hire**.
1699.7	+ 24.8	± 2.0	Eclipse ⊙, by **La Hire**.
1706.4	+ 24.1	± 2.0	Eclipse ⊙, by **La Hire**.
1712.5	+ 14.8	± 0.6	Occultations, by the Paris astronomers.
1715.3	+ 16.2	± 2.5	Eclipse ⊙, by **Flamsteed**, **Halley**, and **Pound**.
1715.3	+ 8	± 4	Eclipse ⊙, by **Cassini**, at Marly.
1715.3	+ 10.3	± 1.5	Eclipse ⊙, by the **La Hires**, at Paris.
1728.5	+ 7.3	± 1.5	Occultations, by **Delisle**, etc.

The discordances among the older results are, on the whole, not greater than what we should expect from the probable errors assigned, except in the case of the eclipse of 1639. In fact, if we suppose the error of the tables to diminish uniformly from 60″, in 1620, to 30″, in 1680, the deviation of the result will in no case exceed 1.5 × the probable error assigned, except in the case of the observations of the eclipse of 1639, by Gassendus and Horrox, where the deviations are, respectively, 3.0 and 4.6 × probable error. The question whether the observations are or are not to be taxed with this apparent error cannot now be settled.

To investigate the questions now under consideration, we must have the correction to Hansen's Tables given by observations from 1750 to the present time. From the comparisons published by Hansen himself in the *Monthly Notices of the Royal Astronomical Society*, it would appear that the correction from 1750 to 1850, inclusive, is very nearly zero. The course of the moon since 1850 has been investigated in Part III of the *Papers published by the Commission on the Transit of Venus*, from which it appears that, at the epoch 1875.0, the meridian observations at Greenwich and Washington indicate a correction to the moon's mean longitude of $-9''.7$. But the occultations about the same time give a correction nearly two seconds less, so that we may consider the correction at this epoch to be $-8''$.

The first question to be considered is how nearly the observations can be represented by theory without any empirical correction. It is well known that Hansen introduced into his tables a term depending on the argument 8 times the mean motion of Venus minus 13 times the mean motion of the earth, which is to be regarded as empirical, since it has never been satisfactorily shown to have any theoretical existence. We must therefore remove this term from the theory to be compared with observation. The secular acceleration is, however, to be left arbitrary, because it depends in part on the unknown tidal retardation of the earth's rotation.

For convenience in solving the equations, we shall graphically interpolate the individual corrections to the moon's mean longitude just collected, so as to give the value of that correction for intervals of a quarter of a century. The values of the corrections to HANSEN's Tables thus interpolated, of HANSEN's doubtful term, and of the resulting correction to a pure theory, are as follows; V_2 representing the doubtful term and $\delta\varepsilon'$ the correction to pure theory:—

1625,	$\delta\varepsilon = +50'' \pm 13''$;	$V_2 = -17''.1$;	$\delta\varepsilon' = +33''$
1650	$+39 \pm 5$	-21.4	$+18$
1675	$+32 \pm 1$	-16.8	$+15$
1700	$+21 \pm 1$	-5.2	$+16$
1725	$+7 \pm 1$	$+8.6$	$+16$
1750	0 ± 1	$+18.9$	$+19$
1775	0 ± 1	$+21.2$	$+21$
1800	0 ± 1	$+14.7$	$+15$
1825	0 ± 1	$+2.1$	$+2$
1850	0 ± 1	-11.4	-11
1875	-8 ± 1	-20.1	-28

It is clear, without computation, that these residuals cannot be represented by corrections to the epoch, mean motion, and secular acceleration. The only secular acceleration we can obtain is an approximation to a mean value, which may have different values according to the mode of using the data, because the mean in question does not admit of precise definition. The deviation during recent years is such that the secular acceleration will come out smaller the greater the weight we assign to the modern observations. To obtain the best result from the ancient and modern observations combined, it seems advisable to assign a minimum probable error of 4″ or 5″ to each residual of the modern observations.

The equations of condition given by the ancient and modern corrections are as follow. In these equations we have put $\delta\varepsilon$ for the correction to the moon's mean longitude in seconds in 1700, and δn for the correction of the centennial mean motion at the same epoch, while δs is the correction to HANSEN's secular acceleration. The first four equations are those given by PTOLEMY's lunar eclipses, p. 44, while the next three are those from the Arabian observations, p. 54. To obtain a more convenient treatment of the equations, the residuals of the ancient observations are expressed in minutes of arc instead of seconds. The equations expressed in seconds may be considered as divided by 60 throughout, and the weights as multiplied by 3600. The unit of weight is supposed to correspond to a probable error of about 6 units

Equations of Condition for the Moon's Mean Motion, etc.

Date — 687;	0.017 $\delta\varepsilon$	— 0.40 δn	+ 9.55 δs	= — 11;	Wt. = 3;	r = + 16′
— 381;	.017	— 0.35	+ 7.28	— 27	2	— 7
— 189;	.017	— 0.31	+ 5.95	— 20	4	— 4
+ 134;	.017	— 0.26	+ 4.11	— 16	3	— 6
850;	.017	— 0.14	+ 1.20	— 4.4	8	— 2.4
927;	.017	— 0.13	+ 0.99	— 1.1	16	+ 0.3
986;	0.017	— 0.12	+ 0.84	— 4.8	30	— 3.8
1625;	1.00	— 0.75	+ 0.56	+ 33	1	+ 6″.1
1650;	1.00	— 0.50	+ 0.25	18	1	— 6.9
1675;	1.00	— 0.25	+ 0.06	15	2	— 7.4
1700;	1.00	0.00	0.00	16	2	— 3.6
1725;	1.00	+ 0.25	+ 0.06	16	2	— 0.3
1750;	1.00	0.50	+ 0.25	19	2	+ 6.4
1775;	1.00	0.75	+ 0.56	21	2	+ 12.5
1800;	1.00	1.00	+ 1.00	15	2	+ 11.1
1825;	1.00	1.25	+ 1.56	+ 2	2	+ 3.0
1850;	1.00	1.50	+ 2.25	— 11	2	— 4.6
1875;	1.00	1.75	+ 3.06	— 28	2	— 15.8

It will be noticed that the corrections from the Arabian observations employed in the equations are a little different from those given on p. 54. This arises from the fact that equal weight was given to all the eclipses in forming these equations. The final result is substantially the same on either system.

Treating the above equations by the method of least squares, we have the normals:—

$$\begin{array}{llll} 20.02\,\delta\varepsilon & +\,12.07\,\delta n & +\,20.62\,\delta s & =+\,174.0 \\ 12.07 & +\,20.60 & -\,9.66 & =+\,15.2 \\ 20.62 & -\,9.66 & +\,657.1 & =-\,1687.0 \end{array}$$

The solution of which gives:—

$$\left.\begin{array}{l} \delta\varepsilon = +\,19''.57 \\ \delta n = -\,12''.31 \\ \delta s = -\,3''.36 \end{array}\right\} \text{Epoch, 1700.}$$

If we transfer the epoch to 1800, the corrections will be:—

$$\left.\begin{array}{l} \delta\varepsilon = +\,3''.90 \\ \delta n = -\,19''.03 \\ \delta s = -\,3''.36 \end{array}\right\} \text{Epoch, 1800.}$$

If we substitute these values of the unknown quantities in the equations of condition, we shall have the residuals following the equations. We see that in the case of the modern observations the residuals are of an entirely inadmissible magnitude;

it is therefore certain that the existing theory will not represent observations with any value whatever of the secular acceleration. Still, the correction which we have deduced for the secular acceleration is clearly indicated by the combination of all the observations. HANSEN'S adopted value being 12″.17, we are led to the value

$$s = 8''.8$$

as that which, on the whole, best satisfies the observations which we have discussed.

Respecting the cause of the outstanding deviations, we may make two hypotheses:—

(1) That these deviations are only apparent ones, arising from inequalities in the axial rotation of the earth. The deviation of the observed secular acceleration from the theoretical value 6″.18 has long been attributed to a retardation of the earth's rotation, and by supposing this retardation to be itself a variable quantity, and indeed sometimes to change into an acceleration, we may completely account for the observed deviations.

(2) We may suppose the deviations to arise from one or more inequalities of long period in the actual mean motion of the moon.

Let us consider these two hypotheses in order. We have first to see what results follow, if we suppose the theory of gravitation to correctly account for all real changes in the mean motion of the moon, and attribute the observed deviations to changes in the earth's axial rotation, or the length of the mean day. To find what these deviations really are, we must take out the effect of HANSEN'S increase of the secular acceleration as well as the empirical term due to the action of Venus from the theory to be compared. The latter has been taken out wherever necessary in the preceding exhibit of the corrections to the moon's mean longitude, and it now remains to consider the former.

The sidereal acceleration adopted in HANSEN'S tables is	$12''.18\ T^2$
While DELAUNAY has found from theory	$6''.18\ T^2$
So that the excess of HANSEN'S tables is	$+\ 6''.00\ T^2$.

If we apply this correction to the tabular residuals, we shall have the results of the hypothetical deviations from a certain uniform measure of time. This measure being arbitrary, we shall take it so that the observed and the assumed measures shall agree in 1750 and 1850. This will be effected by correcting the residuals by the quantity

$$-\ 29''.5 + 18''.0\,T + 6''.0\ T^2,$$

T being counted in centuries from 1700. Applying this correction to the fundamental residuals, we have the series of outstanding corrections to pure theory given in the second column of the following table, while, in the third column, these residuals are converted into seconds of time. The significance of the numbers in question is this:—

If we suppose the accepted theory of the moon's motion to be perfect, and the observed deviations from theory to be due to inequalities in the earth's axial rotation, then the last *column of this table shows the amount in time by which the earth is in advance of an assumed uniformly revolving earth. These numbers must therefore be subtracted from the times indicated by astronomical observations in order to reduce them to a uniform measure of time.*

Epoch -687;	$\delta\varepsilon = +38'.6$,	$\Delta t = -70^m$
-381	$+9.9$	-18
-189	$+9.6$	-17
$+134$	$+3.5$	-6
846	-0.2	0
926	$+2.1$	-4
986	-1.3	$+2$
1625	$-6''.6$	$+12^s$
1650	-19.0	$+35$
1675	-18.6	$+34$
1700	-13.5	$+25$
1725	-8.6	$+16$
1750	0.0	0
1775	$+8.4$	-15
1800	9.5	-17
1825	$+4.4$	-8
1850	0.0	0
1875	-7.6	$+14$

These corrections are so minute that their independent detection by existing observations is barely possible. The most promising means of detection is afforded by the eclipses of the first satellite of Jupiter, which have been observed since 1670. Next in order come meridian observations of Venus during several months on each side of her superior conjunction, the discussion of which would be extremely laborious, and would involve a complete re-examination of the theory of the motion of Venus. Transits of Mercury also afford some hope, but, unfortunately, HALLEY's excellent observation of the transit of 1678 is vitiated by some defect in his clock-error, which cannot be investigated for want of data.

If the hypothesis in question is correct, the problem of predicting the moon's motion with accuracy through long intervals of time must be regarded as hopeless, since it cannot be expected that variations in the earth's axial rotation will conform to any determinable law. Success in tracing the deviations in question to the moon itself and to the theory of gravitation is therefore a consummation to be hoped for.

Passing now to the second hypothesis, a glance at the residuals of the equations of condition on page 263 shows that the modern observations may be very nearly represented by a term having a period of between 250 and 300 years. Let us then inquire how good this representation can be made if we suppose an empirical correction to HANSEN's first term depending on the action of Venus, the period of which is 273 years. In this inquiry, we confine ourselves to the modern observations; and we must introduce, in addition to the term sought, new corrections to the moon's epoch and mean motion. Let us put

$$A = 18\,V - 16\,E - g;$$

V being the mean longitude of Venus, E that of the earth, and g the mean anomaly of the moon. The residual corrections will then be of the form

$$\delta\varepsilon + T\delta n + x \sin A + y \cos A.$$

Counting T in centuries from 1800, the equations of condition will be:—

$$\begin{array}{llllll}
\delta\varepsilon - 1.75\,\delta n & -0.73x & +0.68y & = + & 6''.1 & \text{Wt.} = \tfrac{1}{2} \\
\delta\varepsilon - 1.50 & -0.24 & +0.96 & = - & 6''.9 & 1 \\
\delta\varepsilon - 1.25 & +0.33 & +0.95 & = - & 7''.4 & 5 \\
\delta\varepsilon - 1.00 & +0.79 & +0.62 & = - & 3''.6 & 5 \\
\delta\varepsilon - 0.75 & +1.00 & -0.09 & = - & 0''.3 & 3 \\
\delta\varepsilon - 0.50 & +0.88 & -0.47 & = + & 6''.4 & 4 \\
\delta\varepsilon - 0.25 & +0.48 & -0.87 & = + & 12''.5 & 4 \\
\delta\varepsilon \quad 0.00 & -0.07 & -1.00 & = + & 11''.1 & 4 \\
\delta\varepsilon + 0.25 & -0.60 & -0.80 & = + & 3''.0 & 4 \\
\delta\varepsilon + 0.50 & -0.94 & -0.34 & = - & 4''.6 & 8 \\
\delta\varepsilon + 0.75 & -0.97 & +0.22 & = - & 15''.8 & 10
\end{array}$$

The unit of weight is supposed to correspond to a probable error of about ± 2″.

The treatment by least squares leads to the normals:—

$$\begin{array}{lllll}
48.500\,\delta\varepsilon & -\ 6.375\,\delta n & -\ 6.465\,x & -\ 3.660\,y & = -\ 122''.55 \\
-6.375 & +27.401 & -21.138 & -\ 9.975 & = -\ 89''.26 \\
-6.465 & -21\ 138 & +28.946 & +\ 3.107 & = +\ 196''.17 \\
-3.660 & -\ 9.975 & +\ 3.107 & +19.492 & = -\ 182''.72.
\end{array}$$

The solution of these equations gives:—

$$\left.\begin{array}{l} \delta\varepsilon = -\ 5''.04 \\ \delta n = -\ 10''.14 \end{array}\right\} \text{epoch, 1800.}$$

$$x = -\ 0''.09$$

$$y = -\ 15''.49.$$

The outstanding residuals are:—

1625	+ 3″.9	1775	+ 1″.6
50	− 2″.2	1800	+ 0″.6
75	− 0″.3	25	− 1″.9
1700	+ 1″.0	50	+ 0″.2
25	− 0″.8	1875	+ 0″.2.
50	− 0″.8		

The empirical alteration in question, therefore, represents the observations quite satisfactorily.

The additional diminution of 10″ per century in the mean motion of the moon at the present time will necessitate a farther diminution of 0″.5 in the value of the secular acceleration in order that the ancient observations may still be well represented. This will leave the moon's longitude unaltered by the last correction at the epoch −250.

To represent the Arabian observations without any mean residual, the diminution should be about 3″, so that the observed secular acceleration would be reduced fully to its theoretical value, leaving no tidal retardation whatever. The best mean representation of the ancient observations is, however, given with the acceleration

$$8''.3.$$

The total correction to the mean longitude of HANSEN'S Tables now becomes

$$-1''.14 - 29''.17\,T - 3''.86\,T^2 - V_2 - 0''.09 \sin A - 15''.49 \cos A;$$

V_2 representing, as before, the empirical term due to the action of Venus; A, the angle $18\,V - 16\,E - g$; and T, the time counted in centuries from 1800.

To give a clear view of the course of these corrections, they have been tabulated for ten-year intervals from 1620 to 1900. The results are shown in the following table:—

Year.	A	$-V_2$	$-15''.5 \times \cos A$	Secular Terms.	Total Corr.
	°	″	″	″	″
1620	306.5	+ 15.3	− 9.2	+ 39.0	+ 45.1
30	319.6	+ 18.7	− 11.8	+ 37.4	+ 44.3
40	332.8	+ 20.8	− 13.8	+ 35.7	+ 42.7
50	346.0	+ 21.5	− 15.0	+ 33.9	+ 40.4
60	359.2	+ 20.7	− 15.5	+ 32.1	+ 37.3
70	12.4	+ 18.5	− 15.1	+ 30.2	+ 33.6
80	25.6	+ 15.0	− 14.0	+ 28.2	+ 29.2
90	38.8	+ 10.4	− 12.1	+ 26.2	+ 24.5
1700	52.0	+ 5.2	− 9.5	+ 24.1	+ 19.8
10	65.1	− 0.4	− 6.5	+ 21.9	+ 15.0
20	78.3	− 5.9	− 3.1	+ 19.7	+ 10.7
30	91.5	− 11.1	+ 0.4	+ 17.4	+ 6.7
40	104.7	− 15.5	+ 3.9	+ 15.0	+ 3.4
50	117.9	− 18.9	+ 7.3	+ 12.5	+ 0.9
60	131.0	− 20.8	+ 10.2	+ 10.0	− 0.6
70	144.3	− 21.4	+ 12.6	+ 7.3	− 1.5
80	157.5	− 20.6	+ 14.3	+ 4.6	− 1.7
90	170.7	− 18.3	+ 15.3	+ 1.8	− 1.2
1800	183.9	− 14.7	+ 15.5	− 1.1	− 0.3
10	197.0	− 10.2	+ 14.8	− 4.1	+ 0.5
20	210.2	− 4.9	+ 13.4	− 7.1	+ 1.4
30	223.4	+ 0.7	+ 11.3	− 10.3	+ 1.7
40	236.6	+ 6.2	+ 8.5	− 13.5	+ 1.2
50	249.8	+ 11.4	+ 5.4	− 16.7	+ 0.1
60	263.0	+ 15.7	+ 1.9	− 20.0	− 2.4
70	276.2	+ 19.0	− 1.7	− 23.4	− 6.1
80	289.4	+ 20.9	− 5.2	− 26.9	− 11.2
90	302.6	+ 21.5	− 8.4	− 30.4	− 17.3
1900	315.8	+ 20.6	− 11.1	− 34.1	− 24.6

It will be instructive to notice how these resulting corrections compare with those which have been already deduced from individual observations or groups of observations. This is shown in the following table. The observed corrections and the probable errors $\pm \varepsilon$ are taken without change from the table given on pages 261 and 262.

Date.	Observed Correction.	Formula.	Difference.	$\pm \varepsilon$	Wt.
	″	″	″	″	
1621.4	+ 78	+ 45	+ 33	14	3
1630.4	35	44	− 9	25	1
1633.3	53	44	+ 9	13	3
1635.7	57	43	+ 14	9	6
1639.4	34	43	− 9	11	5
"	23	43	− 20	9	6
"	27	43	− 16	5	6
1645.2	34	41	− 7	10	2
1645.6	51	41	+ 10	8	3
1652.3	38	40	− 2	10	2
1654.6	31	39	− 8	8	3
1661.2	37	37	0	6	3
1662.0	38	37	+ 1	5	4
1666.5	25	35	− 10	10	1
1673.9	39	32	+ 7	4	6
1676.4	23	31	− 8	6	3
1680.0	31	29	+ 2	5	4
"	29.4	29.0	+ 0.4	1.0	100
1684.5	24	27	− 3	4	6
"	32	27	+ 5	2.0	25
1699.7	24.8	19.8	+ 5.0	2.0	25
1706.4	24.1	16.6	+ 7.5	2.0	25
1712.5	14.8	13.9	+ 0.9	0.6	45
1715.3	16.2	12.6	+ 3.6	2.5	3
"	8.0	12.6	− 4.6	4.0	1
"	10.3	12.6	− 2.3	1.5	7
1728.5	7.3	7.5	− 0.2	1.5	7

By comparing the corrections with the probable errors it will be seen that

The residuals are less than the probable error in 11 cases;
The residuals are equal to the probable error in 2 cases;
The residuals are greater than the probable error in 14 cases.

If the theory were itself perfect, this would indicate that the probable errors assigned are, in the mean, somewhat too small. In the case of the eclipse of 1639, by HORROX, it may be regarded as certain that the assigned probable error is too small, as, through inadvertence, proper account was not taken of the uncertainty of his clock-correction.

The results are divided into groups, and the mean by weights has been taken. It will be remarked that each group has its own unit of weight. The mean results for the corrections still outstanding will then be as follows:—

$$\begin{array}{lr}
1635.9, & \delta\varepsilon = -\,2''.0 \pm 4''.2 \\
1649.5 & -\,1''.2 \pm 4''.2 \\
1662.3 & -\,0''.8 \pm 3''.5 \\
1681.7 & +\,1''.3 \pm 0''.8 \\
1699.7 & +\,5''.0 \pm 2''.0 \\
1706.4 & +\,7''.5 \pm 2''.0 \\
1713.1 & +\,0''.5 \pm 0''.5 \\
1728.5 & -\,0''.2 \pm 1''.5.
\end{array}$$

It will be seen that the results are, on the whole, as good as could be expected except in the case of the solar eclipses of 1699 and 1706, where the observations of LA HIRE indicate a correction of several times the probable error. Whether this arises from some systematic error in the observations, or from a real deviation of the moon at those times, must be left to future investigation.

§ 16.

OBSERVED LIMITS OF THE MOON'S SHADOW DURING ITS PASSAGE OVER ENGLAND IN THE TOTAL ECLIPSE OF 1715, WITH A DETERMINATION OF THE CORRECTION TO THE MOTION OF THE MOON'S NODE.

The most remarkable and valuable of the observations of this eclipse were those organized by HALLEY for the purpose of determining the limits of the shadow-path. As the duration of totality increases very rapidly when we first enter the limits of this path, this limit can be fixed with great precision by an observation of duration made a short distance within. Such an observation is of especial value for determining the position of the moon's node. The mode of treating observations of this class is as follows:—

Putting τ_0 for the central duration corresponding to the position of the observer, τ for the observed duration, and ρ_1 for the radius of the shadow, if we compute k from the formula

$$\sin k = \frac{\tau}{\tau_0},$$

the shortest distance of the observer from the centre of the shadow will be

$$\Delta = \rho_1 \cos k.$$

The value of τ_0 is given by the formula

$$\tau_0 = \frac{\rho_1}{\sqrt{X'^2 + Y'^2}}.$$

If only one limit is observed, this result will be subject to errors of the semi-diameters of the sun and moon; but these errors will be eliminated from the mean observations made near the two limits.

The observations we are now to use are found in HALLEY's paper in the *Philosophical Transactions* for 1715. The fixing of the exact geographical positions of the places of observation at first presented a difficulty, which was entirely removed through the kindness of General Sir HENRY JAMES, Chief of the Ordnance Survey of England, who sent me a complete and accurate list of the positions in question.

The following is a summary of all the observations, as given by HALLEY:—

A.—*Stations near Southern Limit.*

1. Norton Court, about 10 miles this side Canterbury. Observer, Rev. Dr. JOHN HARRIS, S. T. D., R. S. S., Prebendary of Rochester. Duration, one minute, or rather less.

2. Bocton, about midway between Norton Court and Canterbury. Observers, the inhabitants. Eclipse, hardly total, a small star being left on the lower part of the sun at greatest obscuration.

3. Cranbrook, in Kent. Observer, WILLIAM TEMPLE, Esq., R. S. S. Sun extinguished for a moment and then reappeared.

4. Wadhurst, beyond Turnbridge Wells. Total, but no duration given.

5. Lewis. Eclipse total for "some short time".

6. Brightling. Not quite total.

The following quantities may be assumed as having the same value for all these stations:—

Value of ε or distance from place of reference	0.658
Augmentation of radius of shadow	.00305
Radius of shadow on plane of reference	.01284
Radius of shadow at points of observation	.01589
Relative velocity, or $\sqrt{X'^2 + Y'^2}$ . . . . (Log.)	9.6720
Duration on central line	$243^s.4$.

We now take the stations in the order in which they are given.

1. *Norton Court.*—In all probability, the duration was between 52^s and one minute.*

$$\text{If } \tau = 52^s\text{, then } \sin k = 0.214;\ \Delta = .01552.$$
$$\text{If } \tau = 60^s\text{, then } \sin k = 0.247;\ \Delta = .01540.$$

The mean of these two results is .01546, with a probable error of less than 6 in the last place.

2. *Bocton.*—The sun could not have presented this appearance at any appreciable distance outside the shadow. Probably the point was exactly on the limit, the sun's limb shining through a depression in the moon's limb. Possibly, the appearance described may have been due to a protuberance; but this does not seem likely. We may therefore put $\Delta = .01589$.

3. *Cranbrook.*—Here also observed $\Delta = \rho_1 = .01589$.

4 and 5.—These stations give only $\Delta < .01589$, but, in the case of Lewis, probably not much less, since a duration of 30^s would correspond to $\Delta = .01577$.

6. *Brightling.*—This only gives $\Delta > .01589$.

---

* At the time of writing this I did not notice that HALLEY elsewhere gave data showing the duration to be exactly 59^s.

The comparison of these results with the tables is as follows; the positions are those furnished by Sir HENRY JAMES. The tabular values of Δ, the minimum distance of the point of observation from the axis of the shadow, are computed by the formulæ of § 7:—

	Latitude.	Longitude.	Tabular Δ.	Observed Δ.	Correction.
	° ′	′			
Norton Court .	51 19.0	− 49.4	+ .01597	.01546	− .00051
Bocton . . .	51 17.7	− 57.4	.01679	.01589	− .00090
Cranbrook .	51 5.7	− 32.4	.01682	.01589	− .00093
Wadhurst . .	51 3.8	− 20.5	.01624	.01589 minus.	− .00035 and more.
Lewis . . .	50 52.6	− 0.8	.01656	.01589 minus. .01577 .	− .00067 and more. − .00079:
Brightling .	50 57.7	− 22.9	.01740	.01589 plus.	− .00167 and less.

The mean of the first three results, giving double weight to Norton Court, is .00071 ± .00010. But since the Lewis observation gives a minimum limit of .00067, the most probable value of the correction may be estimated at − .00075 ± .00008.

B.—*Stations near Northern Limit.*

1. Haverford-West. Observer, Rev. ROGER PROSSER. Eclipse total a minute and a half.

2. Shrewsbury in Shropshire. Observer, Dr. HOLLINGS. Duration of totality, $1^m\ 40^s$.

3. Darrington, about 2 miles this side Pontefract. Observer, THEOPHILUS SHELTON, Esq. The sun reduced almost to a point resembling the planet Mars, and then the light began to increase.

4. Barnsdale, 3 miles south of Darrington. The eclipse "just total".

5. Badsworth. Authority, the Rev. and Learned Mr. DAUBUZ. The corona seen, and therefore the eclipse total.

6. Witley, the seat of Lord FOLEY. Duration, $3^m\ 15^s$.

We have from the elements:—

	Hav. W.	Other st.
Mean value of ζ	0.608	0.632
Augmentation of radius of shadow	.00281	.00291
Radius of shadow on plane	.01284	.01284
Radius of shadow at station	.01565	.01575
Relative velocity . . . . (Log.)	9.6862	9.6805
Duration on central line	$232^s.0$	$236^s.6$

The following values of Δ are derived from the observations:—

1. *Haverford.*—$\sin k = .388$; $\Delta = .01443$.

2. *Shrewsbury.*—$\sin k = .423$; $\Delta = .01427$.

3. *Darrington.*—Here the phenomenon corresponds almost exactly to that at Bocton in the south; we therefore put $\Delta =$ radius of shadow $= .01575$.

4. *Barnsdale.*—Same value of Δ.

5. *Badsworth.*—$\Delta < .01575$, but probably very little less.

6. *Witley.*—So far from the limit as to be entirely unreliable; the results, however, are, $\sin k = .825$; $\Delta = .00891$.

Exhibiting the tabular results in the same form as for the southern limits, they will be shown as follows:—

	Latitude.	Longitude.	Tab. Δ.	Obs. Δ.	Corr. to Δ.
	° ′	° ′			
Haverford W.	51 48.1	+ 4 58.3	− .01418	− .01443	− .00025
Shrewsbury .	52 42.5	+ 2 44.5	− .01266	− .01427	− .00161
Darrington .	53 40.5	+ 1 16.0	− .01511	− .01575	− .00064
Barnsdale . .	53 37.1	+ 1 13.7	− .01441	− .01575	− .00134
Badworth . .	53 37.8	+ 1 18.0	− .01484	− .01564:	− .00080:
Witley . . .	52 16.9	+ 2 20.2	− .00701	− .00891:	− .00190:

The mean correction derived from the first four stations is —.00096. But the observation of the corona at Badworth would indicate a correction numerically less than .00091, which, however, we cannot regard as certain. Altogether, I think we may regard —.00090 as the most probable correction.

We thus have, for the correction to the tabular position of the shadow-path:—

From observations of southern limit,	—.00075
From observations of northern limit,	—.00090
Mean correction,	—.00082.

The correction expressed in terms of the geocentric co-ordinates of the moon, relative to the sun, and of the moon's parallax, is, in units of the 5th place of decimals,

$$-0.44\,\delta\lambda + 27.3\,\delta\beta + 13\,\delta\Pi.$$

The same quantity, being expressed in terms of the correction to the moon's mean longitude, ε, the sun's true longitude, L, and the correction to the longitude of the moon's node, is,

$$\delta\Delta = -3.26\,\delta\varepsilon + 0.4\,\delta L + 2.40\,\delta\theta + 13\,\delta\Pi = -82,$$

the units of the corrections being seconds of arc. The value of $\delta\varepsilon$ given by all the observations of the eclipse is $+11''.2$, while the formula gives $+12''.6$. The most probable value is perhaps the mean of these two results, or $+11''.9$. We necessarily suppose δL and $\delta\Pi$ equal to zero, so that the value of $\delta\theta$ for this epoch will be,

$$\delta\theta = -18'' \pm 5''.$$

From the occultations, we have found (p. 235), $i\,\delta\theta = -0''.14 \pm 1''.2$, which would give

$$\delta\theta = -1'' \pm 13''.$$

The most probable mean result for 1710 is

$$\delta\theta = -16''.$$

In *Investigation of Corrections to* HANSEN'S *Tables of the Moon*,* p. 36, is deduced for 1868

$$\delta\theta = +4''.5.$$

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* Part III of *Papers published by the Commission on the Transit of Venus.*

The correction to HANSEN's motion of the moon's node in one century, therefore, comes out,

$$+13''.0 \pm 4''.$$

In this result, however, no weight is given to the observations used by HANSEN himself. Altogether, I think we may regard the most probable correction as about 10″. The motion of the node being negative, this correction diminishes both its absolute value and the argument of latitude by the quantity

$$10''\,T,$$

T being counted in centuries from 1850. This result, though nearly certain with respect to its algebraic sign, cannot be regarded as definitive, as it will be affected by any correction to HANSEN's value of the moon's parallax.

§ 17.

CONCLUDING REMARKS ON THE VALUE OF THE SECULAR ACCELERATION DEDUCED IN THIS PAPER.

The author is conscious that there may be room for differences of opinion respecting the reality of the very large diminution of the secular acceleration which is indicated by the preceding discussion. A clear summary of the evidence on both sides of the question, and a statement of the data by which it may be settled, may form a fitting conclusion to this investigation. In the first place, it is to be remarked that there are three pieces of evidence, all of which militate against the diminution here deduced, and in favor of the large value found by HANSEN. They are as follows:—

1. The supposed ancient total eclipses known respectively as the eclipse of THALES and the eclipse at Larissa. If the total eclipse of — 584, May 28, really passed over the region in which the celebrated battle described by HERODOTUS is supposed to have been fought, and if the eclipse of — 556, May 19, was really total at the supposed site of Larissa, then no appreciable change of HANSEN's longitude of the moon during those times is admissible. The reasons for doubting the reality of these eclipses are set forth so fully in § 3 that they need not be repeated here.

2. The lunar eclipse of — 382, reported as observed at Babylon. It is certain that if this eclipse was really seen at Babylon, no appreciable diminution of HANSEN's longitude at this time can be admitted.

3. Those lunar eclipses cited by PTOLEMY without a statement of the phase observed, it being hitherto assumed that the times noted are those of the middle of the eclipse. These eclipses are in every way so uncertain that no great stress can be laid upon them.

The sources of evidence which indicate the diminution here deduced are these two:—

α. The Ptolemaic eclipses of the *Almagest*, discussed in § 4 of this paper.

β. The Arabian eclipses, discussed in § 5.

It must be remarked that this is not a case in which the discordant data can be combined by weights. The evidence included under heads 1 and 2 is either conclusive, or false, and therefore worthless. Either the solar eclipses were total at the points supposed, or they were not. If they were, we cannot change HANSEN's longitude; if they were not, we can deduce nothing from them.* The same remark applies to the lunar eclipse of — 382, according to whether we suppose it to have been really seen at Babylon or not. Data α and β do not admit of being disposed of so precisely, but we cannot suppose the acceleration much greater than $8''.3$ without supposing systematic errors which seem quite improbable. To me these errors seem more improbable than mistakes in data 1 and 2, and therefore I regard the small value of the secular acceleration as having the preponderance of evidence in its favor.

The Arabian observations are far more reliable than those of PTOLEMY; it is therefore of interest to know what value of the secular acceleration would be obtained by combining them with the modern observations. The uncertainty respecting the inequalities of long period prevents us from deducing a precise result in this way, but we may safely say that it will differ very little from $7''$, and will therefore be scarcely larger than the theoretical value of the acceleration.

Let us now view the question from the opposite standpoint. Granting the reality of the problematical total eclipses, and therefore the correctness of HANSEN's longitude five or six centuries before CHRIST, how will the undoubted eclipses of PTOLEMY and the Arabians be represented? In considering this question, we must remember that this representation will not be the same as by HANSEN's unaltered tables, because the modern observations have shown that the latter need a correction to the mean motion of the moon at the present time, and the secular acceleration must be taken to accord with this change. It will be remembered that HANSEN's value of the secular acceleration has in itself no foundation whatever either in observation or correct theory, and may therefore be changed at pleasure to fit the foundation which was found for it after its deduction, namely, the ancient eclipses. Since if we retain it unaltered, and admit the mean motion of the moon deduced from modern observations, the ancient eclipses will no longer be represented, we must, to place its value on any foundation at all, change it so that these eclipses shall be represented. The correction to the centennial mean motion given by modern observations we have already found to be $-29''.2$. If, then, we represent by δs the correction to HANSEN's secular acceleration, the total correction to the moon's mean longitude T centuries after 1800 will be

$$-29''\,T + \delta s\,T^2.$$

To represent the ancient total eclipses as required, this quantity should be zero about five and a half centuries before CHRIST, or for $T = -23.5$. This condition will give

$$\delta s = -1''.25;\quad s = 10''.9$$

for the secular acceleration which will represent at the same time the modern observations and the total eclipses of **Thales** and Larissa. The correction to the moon's mean longitude T centuries after 1800 will then be

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* In pronouncing the evidence to admit of no intermediate qualification between conclusiveness on the one hand, and falsity and worthlessness on the other, the author refers not so much to the historic narrative as to that interpretation of the narrative on which the hypothesis of a total eclipse is founded. Making allowance for the exaggerations and uncertainties to which narratives are liable when they pass through uncritical minds, he considers it not at all improbable that the narrative of HERODOTUS respecting the termination of a battle by darkness may have originated from a partial eclipse of the sun, which terrified or impressed the combatants, especially if this eclipse was almost total when the sun set. Hence, conceding that the phenomenon was really the eclipse of — 584, he considers that the narrative does not enable us to decide whether the eclipse was total or partial.

$$-T\,(29'' + 1''.25\;T).$$

We now desire to know how these corrections will alter the representation of the Ptolemaic and Arabian eclipses. For the former, the representation will be substantially the same as by the unaltered tables of **Hansen**, because the factor $29'' + 1''.25\;T$ vanishes in the course of the observations. If the ancient solar eclipses are real, we must still suppose that the great mass of **Ptolemy**'s eclipses are more than half an hour in error.

For the Arabian eclipses, T ranges from -9.7 to -8.0, and the consequent corrections to the tabular mean longitudes of the moon are:—

$$\text{For }\ 829,\ \delta\varepsilon = +2'.7$$
$$\text{For }1000,\ \delta\varepsilon = +2'.5.$$

To find how the Arabian observations represent the revised theory, we must suppose that in the comparisons given on page 52 the tabular longitude is increased by these amounts before being compared with observation. We must therefore apply these values of $\delta\varepsilon$ negatively to the column Δl to obtain the new corrections. These new corrections are then converted into time by dividing them by the factor F, whereby we obtain the following corrections to the tabular times given by all the Arabian observations. In order to facilitate a discussion of the results, and the detection of any systematic error among the observations, a threefold classification is made according to whether the eclipse was of the sun or of the moon, whether the beginning or end was observed, and whether the altitude on which the time depends was observed east or west of the meridian. The latter distinction is important, because any constant error in determining the altitudes will have opposite effects on the two sides of the meridian.

BAGDAD.

Year 829,	Ecl. ⊙,	Beg.,	$\delta t = (+51^{\rm m})$	Alt. E.
829	⊙	End	$+24$	E.
854	☽	Beg.	$+12$	E.
856	☽	Beg.	$+\ 9$	E.
923	☽	End	$+12$	E.
923	⊙	End	$+23$	E.
925	☽	Beg.	$+\ 1$	E.
925	☽	End	$+\ 7$	E.
927	☽	Beg.	$-\ 8$	E.
928	⊙	End	$+16$	E.
929	☽	Beg.	(-53)	
933	☽	Beg.	$+\ 7$	E.

CAIRO.

Year 977,	Ecl. ⊙,	Beg.,	(*S*),	$\delta t = +16^m$	Alt. E.
977	⊙	End		$+10$	E.
978	⊙	Beg.	(*S*)	$+34$	W.
978	⊙	End		$+9$	W.
979	☽	End		$+16$	?
979	⊙	Beg.	(*S*)	$+15$	W.
979	☽	Beg.		$+8$	E.
979	☽	End		$+19$	W.
980	☽	End		$+10$	?
981	☽	Beg.		$+8$	W.
981	☽	End		$+3$	?
981	☽	Beg.		$+20$	W.
983	☽	End		$+22$	W.
985	⊙	Beg.		$+30$	W.
985	⊙	End		$+19$	W.
986	☽	Beg.	(*S*)	$+27$	W.
990	☽	Beg.		-20	E.
993	⊙	Beg.		$+6$	E.
993	⊙	End		$+25$	E.
1002	☽	Beg.		$+6$	E. and $+10^m$ W.
1004	⊙	Beg.		$+16$	W.

Taking the means by classes, we find:—

From ⊙, Beginning, mean $\Delta t = +19^m$
⊙, End, $+18$
☽, Beginning, $+6$ or $+9^m$
☽, End, $+9$

The large difference between the solar and lunar eclipses arises in part from the fact that a change in the moon's longitude will generally cause a greater change in the time of a lunar than in that of a solar eclipse. The two means for ☽ beginning are derived, the one by retaining, and the other by rejecting, the discordant observation of 990.

In the Bagdad eclipses, the altitudes were all observed in the east, so that we should omit them entirely in comparing east and west observations. From the Cairo eclipses, we have:—

Mean result from east altitudes, $\Delta t = +7^m$ or $+12^m$,

according as the discordant observation of 990 is retained or rejected;

Mean result from west altitudes, $\Delta t = +20^m$.

That the positive correction of ten or fifteen minutes thus indicated should be unreal seems to me out of the question. If one had to explain their unreality, the most natural way of doing so would be to suppose that the observations were tampered with to suit some theory. But this explanation seems inadmissible, because the consistency with the modern theory of the inequalities of the sun and moon is, I think, greater than that of the best theory the Arabians could have constructed. This consideration seems to me to be conclusive in favor of the genuineness of the Arabian observations. To suppose the differences to result from purely accidental errors seems so far beyond the bounds of reasonable probability that no discussion of such a proposition is necessary. Apparently, therefore, we can hardly avoid accepting one of these propositions :—

Either the recently accepted value of the acceleration and the usual interpretation of the ancient solar eclipses are to be radically altered, the eclipse of — 556 not having been total at Larissa, and that of — 584 not having been total in Asia Minor;

Or the mean motion of the moon is, in the course of centuries, subjected to changes so wide that it is not possible to assign a definite value to the secular acceleration.

In conclusion, it may be interesting to inquire what light other material than that discussed in the preceding pages may throw on the questions at issue. The most important of these questions is that of the moon's mean longitude from twenty to twenty-four centuries ago, on which must depend our interpretation of the ancient solar eclipses. I am aware of only two classes of data which can be reasonably expected to throw light upon this question separate from any theory of the moon's motion founded on modern observations. The first of these are historical total eclipses described in other writings than those of the Greek and Roman classic authors. Some of the Chinese eclipses were discussed by SCHJELLERUP in a paper presented to the Danish Academy of Sciences about 1875. The remains of Assyrian tablets, discovered during the last few years, contain descriptions of or allusions to eclipses which may hereafter be found to be total. The other class includes the occultations of stars, or the positions of the moon relative to certain stars, which are described by PTOLEMY in Book VII of the *Almagest.* In this class, we might also include the so-called eclipse of THEON, described by THEON in his commentary on the *Almagest.*

The author has used none of this material, because the whole of it seemed to be unreliable. It has been his aim, in the preceding investigation, to confine his discussions to observations which could be received with some approach to entire confidence. Had other material been admitted, the probable result would have been a great mass of discordant results, much of which would have to be rejected on account of its incompatibility with other portions. The result to be finally accepted would then have depended very largely on what observations were rejected and what retained, and this would necessarily have depended on the judgment of the investigator. It would hardly have been possible to have formed such a judgment without the suspicion of its being influenced by his wishes or prejudices. It therefore seemed better to avoid this necessity, as far as possible, by employing no material on the general reliability of which the author would have felt unwilling to stake the correctness of his conclusion, or, speaking more plainly, which he would have meant to retain if it came out right, and reject if it came out wrong. It was, of course, impossible to have an assurance of every datum proving compatible with every other one, as is shown by the rejection of one Ptolemaic and two or three Arabian eclipses. But this proportion of rejected material seems small, considering the necessary uncertainty of the channels through which the observations have reached us.

Now, returning to the material which, though rejected, may not be valueless, the objection to the use of the Chinese and Assyrian eclipses was substantially the same as that to the classical eclipses: the accounts inspired no reasonable certainty that the eclipses were severally total at definite points of the earth's surface. The occultations cited by Ptolemy seemed worthy of more confidence, and I went so far as to make a summary of Ptolemy's statements, but they were so far from being precise that some hesitancy was felt in deciding whether they were worth employing. I finally concluded to omit them from the fact that they are cited by Ptolemy, not for the purpose of presenting a complete series of observations, but to prove that the erroneous value of the constant of precession deduced by Hipparchus, namely, one degree in a century, was correct. Being in all probability selected for the purpose of proving an erroneous hypothesis, it was hardly possible to employ them without the reservation above alluded to, that they should be accepted or rejected according as their results did or did not agree with those derived from other data.

The eclipse of Theon was observed in the year 364, less than five centuries before the commencement of the series of eclipses given by Ebn Jounis. It seems to me scarcely worthy of confidence. He begins by stating that he accurately calculated the time of beginning, and found it to be two hours and fifty minutes, and then, that having carefully observed the time of beginning, he found it exactly the same. The time of ending is given as observed, and as it was not stated to have been predicted, less suspicion may attach to it. In the absence of any indication how his times were determined, and in the suspicious coincidence of observed and computed time of beginning, to say nothing of a certain vagueness which runs through his narrative, it seems to me that we have reason to place this eclipse in the same category with other rejected material.[1]

Granting that the question whether Hansen's tabular mean longitude of the moon does or does not require a large negative correction during the centuries which preceded the Christian era (which question is the fundamental one) remains undecided, the question may arise how a decisive answer can be reached. This depends upon whether a correct theory of the apparent inequalities of long period in the moon's mean motion can be constructed. If such a theory cannot be formed, and if the mean motion of the moon is subject to such changes from age to age that no constant and well-defined value can be assigned to the secular acceleration, then it is not certain that the question can ever be conclusively settled, because, in this case, no conclusion can be drawn from observations made at any other time than during or near the period in question. The only course will be to make a complete re-examination of all ancient eclipses and other data which may throw light on the question, and to compare them with the results of the two hypotheses: first, that Hansen's Tables are correct during the period in question; and, second, that they require a correction of sixteen minutes, subtractive. Should the evidence prove to be mainly in favor of one hypothesis, that hypothesis would have to be accepted; should it be hopelessly discordant, the question would remain undecided. The author would be very glad to see the question examined in this way by some independent authority.

If, on the other hand, a perfect theory of all the inequalities in the moon's mean motion can be formed independently of observations, the question will, in all probability, admit of being settled by the modern observations alone. On page 25 of the present paper is given an estimate showing how accurately, on the hypothesis in question, the secular acceleration can be determined when the observations between 1620 and 1720 are substituted for the ancient observations. Comparing the probable errors there assumed with those of the final results given in the preceding sections, it will be seen that while the results of the observations near 1700 are perhaps a little less accurate than is there assumed, those between 1630 and 1670 appear more accurate. Making the most liberal allowance for uncertainty of every kind, the probable error of the secular acceleration to be derived from the modern observations alone could scarcely amount to 1″ in the case supposed, and would be considerably reduced by the observations which will be made before the end of the present century. Since the competing values, 8″.4 and 10″.9, differ from each other by 2″.5, a result derived in the way we have described would be likely to decide between them if its probable error was 1″, and would be almost sure to do so if it did not exceed 0″.5, which I think would prove to be the case.

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WASHINGTON OBSERVATIONS FOR 1875—APPENDIX III.

CHRONOMETER RATES

AS AFFECTED BY

CHANGE OF TEMPERATURE AND OTHER CAUSES.

BY

LIEUTENANT COMMANDER C. H. DAVIS, JR., U. S. N.
IN CHARGE OF CHRONOMETERS AT THE U. S. N. OBSERVATORY.

WASHINGTON:
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1878.

CHRONOMETER RATES AS AFFECTED BY CHANGE OF TEMPERATURE AND OTHER CAUSES.

During the past twenty-five years much has been written on the subject of chronometer rates and the influences of temperature on them, and various formulæ have been proposed by the aid of which it was hoped that changes in rates due to change of temperature and other causes might be predicted.

The French have taken the lead in this investigation, and the writings of MM. Lieussou, Yvon Villarceau, Mouchez, Pagel, A. de Magnac, Fleurais ,and others, have thrown much light upon the subject.

M. Lieussou was the first published authority in France, although in this country his formula had been derived independently by Mr. Bond. (See Report of United States Coast Survey, 1854.) Mr. Hartnup has used Lieussou's formula since 1863.

Some of the authors above quoted have written with the object of establishing a theory, and their works, although instructive, are apt to mislead.

An impartial discussion of the various formulæ is the object of this paper.

The records of chronometers at the Naval Observatory afford abundant data for the investigation, extending over many years, and embracing records of chronometers of every degree of excellence.

To those who have seen the published accounts of Mr. Hartnup's labors at the Liverpool observatory (almost the only publications in the English language which bear upon our subject), the impression may have been conveyed that some apparatus for changing and maintaining an artificial temperature, to which chronometers under investigation are subjected, is absolutely necessary. Such impression is an erroneous one. It may be true that the apparatus referred to would facilitate investigation. By its means chronometers could be kept exposed to an unvarying temperature for a definite time, and the temperature changed at regular intervals. In this way the effects of anomalous and other causes, incidental to long periods, would be reduced to a minimum, and it would be safe to ascribe the changes of rate observed to change of temperature alone. But when a chronometer is in use change of rate does not depend alone on change of temperature. The causes which induce change of rate are always at work, and their gross result appears in observations extending over long periods of time. The value of the formulæ is not so great for predicting rates, which in ordinary navigation with good chronometers is a matter of small importance, but rather for affording a means of weighing the results of chronometer observations.

The causes which induce changes of rate in chronometars are :

1st. Change of temperature.

2d. Lapse of time, including condition and age of oil used in lubricating, wear of pivots, etc.

3d. Influence of magnetism, or polarity of balance.

4th. Anomalous causes, such as motion of the chronometer, shocks received in transportation or on board ship, etc.

Chronometers are so constructed as to make the influence of all these causes (with the exception of the 3d) as slight as possible.

They are regulated as nearly as may be to a uniform rate, and compensated for change of temperature.

They are cleaned once in five years at least, and the finest oil is used in lubricating.

They are hung on gimbals, in order that they shall maintain a constant perpendicularity.

Finally, the degree of success with which these operations are performed, second to the perfection of construction, makes the chronometer a reliable or unreliable one.

However well the chronometer may be compensated, it is impossible to entirely overcome the influence of these various causes. They make themselves felt, more or less, in every instrument.

In investigating their influence, these causes are classified under two heads:

1st. Temperature alone.

2d. Time elapsed, which embraces all the causes which influence the rate, except temperature. Hereafter, when the influence of time is spoken of, it must be understood as including the others.

The following brief description of the method of rating chronometers at the Naval Observatory is essential to a clear understanding of the pages which follow.

All chronometers are compared daily at noon with the standard mean time clock. The clock (which is a most excellent one) is rated by observations with the transit-circle, taken as often as convenient.

Every tenth day is *rate-day*, on which day the error of each chronometer on Greenwich mean time, together with its rate during the preceding ten days, is determined. The error of the standard clock used in rating chronometers is always computed from the nearest observations preceding and following *rate-day*.

Observations of temperature are made daily at noon by means of a self-registering Fahrenheit thermometer.

The results of rating are kept in the *rate-book*. The rate-book, therefore, shows:

1st. The actual error of each chronometer on Greenwich mean time for every tenth day.

2d. Its rate for the preceding ten days.*

3d. The mean temperature corresponding to this rate

Suppose, now, that we draw axes of coördinates, and construct a curve of temperatures and a curve of rates taken from our observations for a convenient period.

Let the abscissas be a scale of dates, and the ordinates a scale of degrees of temperature. The observed mean temperatures and the corresponding dates give us a series of points on the curve of temperatures.

Using the same abscissas, and the corresponding mean rates, measured by a scale of seconds of time as ordinates, we get the corresponding curve of rates. Fig. 1 is

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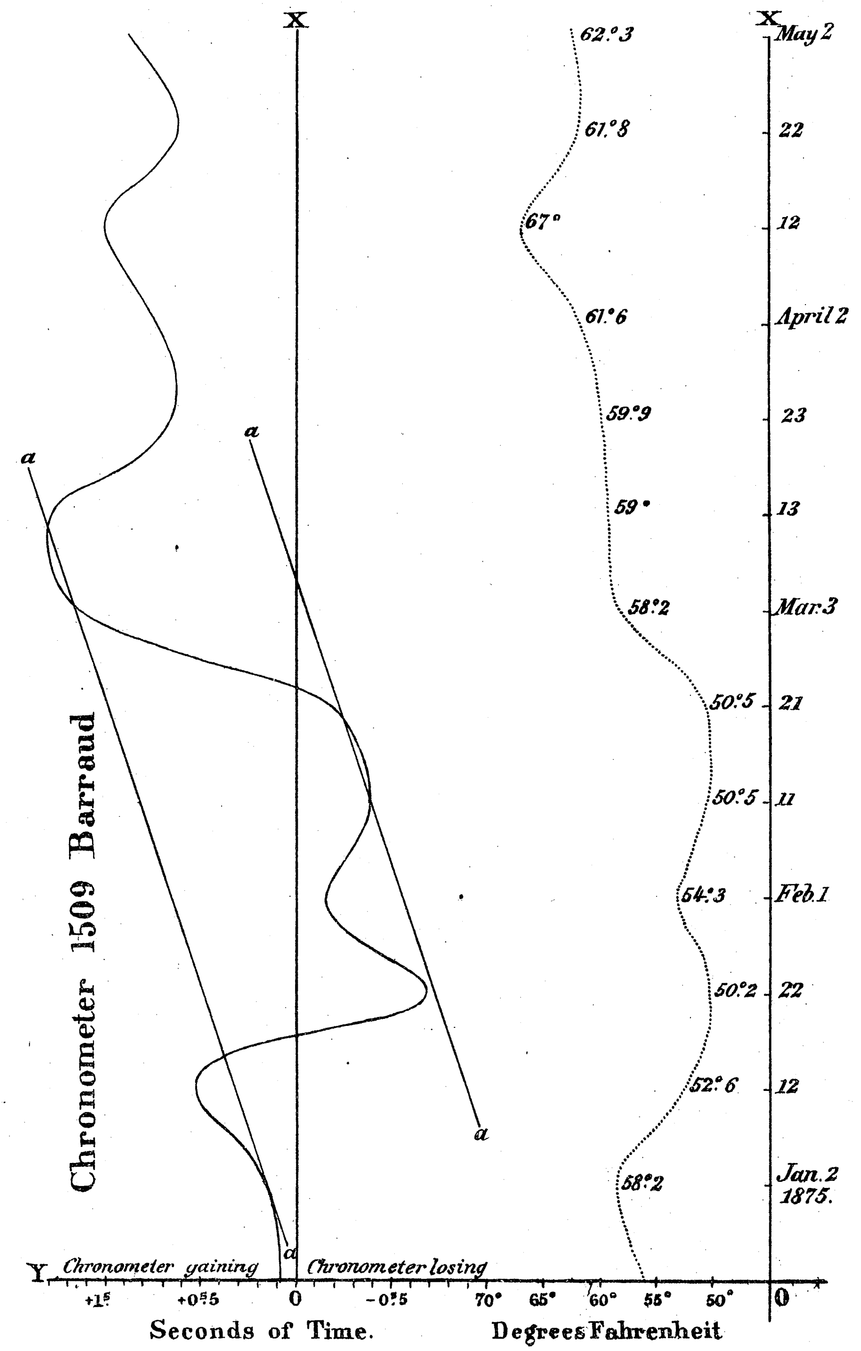
* In speaking of chronometer errors and rates, + signifies fast, or gaining, and – signifies slow, or losing.

Fig. 1.


Chronometer 1509 Barraud
X
X
a
a
a
a
May 2
22
12
April 2
23
13
Mar. 3
21
11
Feb. 1
22
12
Jan. 2
1875.
62.°3
61.°8
67°
61.°6
59.°9
59°
58.°2
50.°5
50.°5
54.°3
50.°2
52.°6
58.°2
Y
Chronometer gaining
Chronometer losing
+1s
+0s.5
0
-0s.5
70°
65°
60°
55°
50°
0
Seconds of Time.
Degrees Fahrenheit

the construction of the curves, extending over a period of four months, for chronometer 1509 Barraud. The dotted line is the curve of temperatures, and the full line the curve of rates.

Find on the curve of rates points corresponding to equal temperatures on the curve of temperatures. Connect these points by lines drawn from one to the other. These lines are *lines of isothermal rates*, and represent what the curve of rates would be at a constant temperature. In the figure the *lines of isothermal rates* are drawn for 58°.2 and for 50°.5 (a, a).

If the rate of the chronometer were influenced only by temperature, these lines would be straight lines, parallel to the axis of X.

If the lines are straight, not parallel to the axis of X, but parallel to each other, their common inclination to the axis of X is the measure of influence of time elapsed.

If the lines are neither parallel to the axis of X nor to each other, they may be regarded as tangents to a curve, whose equation, if it be a regular curve, may give the measure of influence of time elapsed.

THE FORMULA OF LIEUSSOU.

The first formula to be considered, that of M. Lieussou, is based on the assumption that the lines of isothermal rates may be regarded as straight lines, parallel to each other, and having a common inclination to the axis of X.

This being granted—

1st. The inclination of the lines to the axis of X represents the variation of rate at a constant temperature.

2d. The distance between these parallels, counted on the ordinates, represents the variation of rate, at the same date, effected by change of temperature.

It follows that by cutting the curve of rates by a series of isothermal parallels corresponding to different degrees of temperature, the increase of the ordinates, in passing from one abscissa to another on the same parallel, will give the change of rate due to change of date, while the increase of an ordinate, in passing from one parallel to another on the same abscissa, will give the change of rate due to change of temperature.

The system of isothermal parallels, drawn on the curve of rates, has a marked inclination to the axis of X. There is one *parallel of greatest (gaining) rate*, corresponding to a certain temperature θ°, special to each chronometer, and a sensible coincidence between the two parallels corresponding to any two temperatures, $(\theta^\circ + \mathrm{K})$ and $(\theta^\circ - \mathrm{K})$, equidistant from θ°, whose distance from the *parallel of greatest gaining rate*, reckoned on an ordinate, is proportional to K^2.

If, then, r is the rate observed at θ°, a the inclination of the isothermal parallels to the axis of X, and c the constant relation between the distances of the parallels from the *parallel of greatest gaining rate* and the squares of the differences of temperature from the temperature θ°, the rate at θ°, and at any date $(t'-t)$, will be $r + a\,(t'-t)$, and the rate r', at the same date $(t'-t)$, and at the temperature θ' will be

$$(1) \qquad r' = r + a\,(t' - t) - c\,(\theta - \theta')^2$$

This, then, is the equation of a chronometer, in terms of the time and temperature considered as independent variables, provided that the lines of isothermal rates are straight lines, parallel to each other.

The four constants, a, r, c, and θ, which enter into this equation, and have particular values for each chronometer, may be determined by means of any four rates, observed at different dates and temperatures, represented by r_1, r_2, r_3, and r_4, the four daily rates observed at the temperatures, θ_1, θ_2, θ_3, and θ_4, supposing them, to facilitate the computation of the constants, to be separated by an equal interval h; we have then the four equations of condition:

$$\begin{aligned} r_1 &= r + 0a - c(\theta - \theta_1)^2 \\ r_2 &= r + ha - c(\theta - \theta_2)^2 \\ r_3 &= r + 2ha - c(\theta - \theta_3)^2 \\ r_4 &= r + 3ha - c(\theta - \theta_4)^2 \end{aligned}$$

whence

$$\begin{aligned} r_1 - 2r_2 + r_3 &= -c\left(\theta_1^2 - 2\theta_2^2 + \theta_3^2 - 2\theta(\theta_1 - 2\theta_2 + \theta_3)\right) \\ r_2 - 2r_3 + r_4 &= -c\left(\theta_2^2 - 2\theta_3^2 + \theta_4^2 - 2\theta(\theta_2 - 2\theta_3 + \theta_4)\right) \\ r_3 + r_4 - r_1 - r_2 &= 4ha - c\left(\theta_3^2 + \theta_4^2 - \theta_1^2 - \theta_2^2 - 2\theta(\theta_3 + \theta_4 - \theta_1 - \theta_2)\right) \\ r_1 + r_2 + r_3 + r_4 &= 4r + 6ha - c\left((\theta - \theta_1)^2 + (\theta - \theta_2)^2 + (\theta - \theta_3)^2 + (\theta - \theta_4)^2\right) \end{aligned}$$

or, by abbreviation,

$$\begin{aligned} \alpha &= -c(\beta - 2\theta\gamma) \\ \alpha' &= -c(\beta' - 2\theta\gamma') \\ \alpha'' &= 4ha - c(\beta'' - 2\theta\gamma'') \\ \alpha''' &= 4r + 6ha - c\left((\theta - \theta_1)^2 + (\theta - \theta_2)^2 + (\theta - \theta_3)^2 + (\theta - \theta_4)^2\right) \end{aligned}$$

These relations lead to the following expressions:

$$(a) \qquad \theta^{\circ} = \frac{1}{2} \cdot \frac{\alpha\beta' - \alpha'\beta}{\alpha\gamma' - \alpha'\gamma}$$

$$(b) \qquad c^{s} = \frac{\alpha\gamma' - \alpha'\gamma}{\beta'\gamma - \beta\gamma'}$$

$$(c) \qquad \alpha^{s} = \frac{1}{4h}\left(\alpha'' + c(\beta'' - 2\theta\gamma'')\right)$$

$$(d) \qquad r^{s} = \frac{1}{4}\left(\alpha''' - 6ha + c\left((\theta - \theta_1)^2 + (\theta - \theta_2)^2 + (\theta - \theta_3)^2 + (\theta - \theta_4)^2\right)\right)$$

These four equations determine the four constants in terms of the rates and temperatures. In order to obviate, as much as possible, errors of observation, we should substitute for r_1, r_2, r_3, r_4, and θ_1, θ_2, θ_3, θ_4, the mean rates and corresponding mean temperatures observed in 10, 20, or 30 days; that is, each one of our equations of condition should be made up from a group of equations of observation, care being had that the same number of observations be taken to form each equation of condition, in order that they may all have the same weight.

In equation (1) there are four constants, r, a, c, and θ.

The constant θ is the special temperature at which the chronometer has its greatest gaining rate. For a well-regulated chronometer, its value should be about 70° Fahrenheit, or between 60° and 70°.

The coëfficient c is the diminution of daily rate for a change of temperature of one degree Fahrenheit, more or less, from θ°. It is the measure of imperfection of compensation, and should remain constant as long as the compensation of the balance is unchanged. In a good chronometer, this coëfficient should not exceed $0^s.006$.

The coëfficient a is the change of rate of the chronometer in the unit of time at the same temperature. This coëfficient cannot be depended on to remain constant. It is an expression, not only for change of rate due to time elapsed, but also for change due to every other cause which affects the rate, except temperature (see p. 4). It may be assumed as constant only within certain limits of observation.

The constant r is the rate of the chronometer at θ°; it is the measure of imperfection of rating on mean time at the temperature θ°. This initial rate is augmented or diminished by a quantity $a\ (t' - t)$, proportional to the number of days $(t' - t)$ elapsed since its first determination. If a changes, the value of r must also change.

In a good chronometer, therefore, the values of θ and c may be depended on for a much longer period than those of a and r. These latter can only be depended on within certain limits of observation, or only for short periods beyond those limits.

The values of the four constants may be determined by means of four equations of condition, each equation of condition being the mean of an equal number of observations. In forming the equations of condition, it must be noticed that the intervals covered by the observations should neither be too long nor too short. For too short an interval, the constants are liable to be affected by errors of observation. For too long an interval, with great changes of temperature, they will be affected by the error of accepting the mean rate for the rate corresponding to the mean temperature.

We now proceed to the practical adaptation of this formula to several chronometers.

In the case of No. 273 Bond, the record of observations gives the following table, the rates and temperatures being the mean of observations for 30 days:

Mean date.	Rate observed.	Temperature observed.	Chronometer No. 273 Bond. Equations of condition.
1874, April 12	$-0^s.958$	$61^\circ.1$	$-0.958 = r + 0\,a - c\,(\theta^\circ - 61^\circ.1)^2$
1874, July 11	$-1^s.631$	$83^\circ.8$	$-1.631 = r + 90\,a - c\,(\theta^\circ - 83^\circ.8)^2$
1874, Oct. 9	$-0^s.687$	$69^\circ.4$	$-0.687 = r + 180\,a - c\,(\theta^\circ - 69^\circ.4)^2$
1875, Jan. 7	$-0^s.688$	$54^\circ.0$	$-0.688 = r + 270\,a - c\,(\theta^\circ - 54^\circ.0)^2$

Whence (see p. 6),

$$\begin{array}{lll} \alpha = +1.617 & \beta = -5495.31 & \gamma = -37.1 \\ \alpha' = -0.695 & \beta' = +305.72 & \gamma' = -1. \\ \alpha'' = +1.254 & \beta'' = -3023.29 & \gamma'' = -21.5 \\ \alpha''' = -3.964 & & \end{array}$$

$$\theta = \frac{1}{2} \cdot \frac{+494.349 - 3819.24}{-1.617 - 25.784} = \frac{-3324.891}{-54.803} = 60^\circ.7$$

$$c = \frac{-27.4015}{-16837.52} = .0016$$

$$a = \frac{1}{360} \left\{ +1.254 + .0016\,(-3023.29 + 2610.10) \right\} = +.0016$$

$$r = \frac{1}{4} \left\{ -3.964 - .864 + .0016\,(454.35) \right\} = -1.025$$

$t =$ April 27, 1874.

On April 12, 1874, the equation of chronometer 273 Bond may be written—

$$r' = -1^s.025 + .0016\,(t' - t) - .0016\,(60^\circ.7 - \theta')^2$$

By substituting in this equation the proper values of t, t', and θ', we may obtain a series of computed rates, which are to be compared with the corresponding observed rates.

This has been done, and the results in this case and four others are contained in the following tables. It is proper to observe that the equations of condition being formed from the mean of observations for 30 days, the computed rates should properly be compared with the mean of the observed rates for 30 days The mean of 10 days used in these tables is very little in error, and the difference is insignificant

At the head of each table are written the equations of condition used in determining the constants. These indicate the limits of observation in each case, which are marked in the tables with a line drawn across the page. All computed rates below the line are predictions.

CHRONOMETER 273 BOND.

t = April 12, 1874.

Rate-day.	Mean date corresponding to rate.	θ'	Rate computed.	Rate observed.	Diff.
		°	s.	s.	
April 27, 1874	April 22, 1874	62.	−1.011	−1.099	.088
May 7, 1874	May 2, 1874	63.5	−1.005	−0.971	.034
May 17, 1874	May 12, 1874	71.3	−1.157	−1.218	.061
May 27, 1874	May 22, 1874	69.8	−1.093	−1.624	.531
June 6, 1874	June 1, 1874	76.1	−1.324	−1.604	.280
June 16, 1874	June 11, 1874	81.2	−1.551	−1.730	.179
June 26, 1874	June 21, 1874	80.	−1.509	−1.242	.267
July 6, 1874	July 1, 1874	84.6	−1.991	−1.595	.396
July 16, 1874	July 11, 1874	84.	−1.750	−1.706	.044
July 26, 1874	July 21, 1874	82.9	−1.653	−1.592	.061
Aug. 5, 1874	July 31, 1874	79.7	−1.427	−1.243	.184
Aug. 15, 1874	Aug. 10, 1874	80.2	−1.441	−1.203	.238
Aug. 25, 1874	Aug. 20, 1874	81.4	−1.502	−1.220	.282
Sept. 4, 1874	Aug. 30, 1874	73.6	−1.067	−0.874	.193
Sept. 14, 1874	Sept. 9, 1874	79.3	−1.338	−1.046	.292
Sept. 24, 1874	Sept. 19, 1874	74.8	−1.079	−1.023	.056
Oct. 4, 1874	Sept. 29, 1874	72.	−0.992	−0.784	.208
Oct. 14, 1874	Oct. 9, 1874	69.5	−0.861	−0.722	.139
Oct. 24, 1874	Oct. 19, 1874	66.8	−0.780	−0.555	.225
Nov. 3, 1874	Oct. 29, 1874	67.5	−0.779	−0.646	.133
Nov. 13; 1874	Nov. 8, 1874	65.3	−0.723	−0.586	.137
Nov. 23, 1874	Nov. 18, 1874	60.9	−0.673	−0.635	.038
Dec. 3, 1874	Nov. 28, 1874	59.2	−0.661	−0.768	.107
Dec. 13, 1874	Dec. 8, 1874	60.4	−0.591	−0.510	.081
Dec. 23, 1874	Dec. 18, 1874	57.2	−0.645	−0.449	.196
Jan. 2, 1875	Dec. 28, 1874	58.2	−0.618	−0.335	.283
Jan. 12, 1875	Jan. 7, 1875	52.6	−0.698	−0.770	.072
Jan. 22, 1875	Jan. 17, 1875	50.2	−0.753	−0.961	.208
Feb. 1, 1875	Jan. 27, 1875	54.3	−0.626	−0.588	.038
Feb. 11, 1875	Feb. 6, 1875	50.5	−0.711	−0.701	.010
Feb. 21, 1875	Feb. 16, 1875	50.5	−0.695	−0.668	.027
Mar. 3, 1875	Feb. 26, 1875	58.2	−0.523	−0.402	.121
Mar. 13, 1875	Mar. 8, 1875	59.0	−0.502	−0.270	.232
Mar. 23, 1875	Mar. 18, 1875	59.9	−0.483	−0.298	.185
April 2, 1875	Mar. 28, 1875	61.6	−0.466	−0.193	.273
April 12, 1875	April 7, 1875	67.0	−0.512	−0.266	.246
April 22, 1875	April 17, 1875	61.8	−0.435	−0.237	.198
May 2, 1875	April 27, 1875	62.3	−0.421	−0.164	.257
May 12, 1875	May 7, 1875	65.9	−0.544	−0.317	.227
May 22, 1875	May 17, 1875	69.3	−0.503	−0.450	.053
June 1, 1875	May 27, 1875	76.4	−0.763	−1.102	.339
June 11, 1875	June 6, 1875	74.5	−0.657	−1.059	.402
June 21, 1875	June 16, 1875	73.3	−0.591	−1.046	.455
July 1, 1875	June 26, 1875	83.3	−1.138	−1.609	.471
July 11, 1875	July 6, 1875	82.3	−1.051	−1.561	.510
July 21, 1875	July 16, 1875	81.3	−0.967	−1.574	.607

CHRONOMETER 777 NEGUS.

t = July 21, 1874.

$$\left.\begin{aligned} &1874,\ \text{July}\ 21: -0.742 = r + 0\,a - c\,(\theta^\circ - 82.9)^2 \\ &1874,\ \text{Oct.}\ 19: -1.005 = r + 90\,a - c\,(\theta^\circ - 66.8)^2 \\ &1875,\ \text{Jan.}\ 17: -4.011 = r + 180\,a - c\,(\theta^\circ - 50.2)^2 \\ &1875,\ \text{Apr.}\ 17: -2.387 = r + 270\,a - c\,(\theta^\circ - 61.8)^2 \end{aligned}\right\}\ \text{Mean of 10 days.}$$

$$\text{Equation}: r' = -0^s.339 - .005\,(t' - t) - .005\,(73^\circ.6 - \theta)'^2$$

Rate-day.	Mean date corresponding to rate.	θ'	Rate computed.	Rate observed.	Diff.
		°	s.	s.	
Aug. 5, 1874	July 31, 1874	79.7	−0.575	−0.243	.332
Aug. 15, 1874	Aug. 10, 1874	80.2	−0.656	−0.503	.153
Aug. 25, 1874	Aug. 20, 1874	81.4	−0.798	−0.720	.078
Sept. 4, 1874	Aug. 30, 1874	73.6	−0.539	−0.374	.165
Sept. 14, 1874	Sept. 9, 1874	79.3	−0.751	−0.496	.245
Sept. 24, 1874	Sept. 19, 1874	74.8	−0.646	−0.823	.177
Oct. 4, 1874	Sept. 29, 1874	72.	−0.702	−0.634	.068
Oct. 14, 1874	Oct. 9, 1874	69.5	−0.823	−0.772	.051
Oct. 24, 1874	Oct. 19, 1874	66.8	−1.020	−1.005	.015
Nov. 3, 1874	Oct. 29, 1874	67.5	−1.025	−1.146	.121
Nov. 13, 1874	Nov. 8, 1874	65.3	−1.233	−1.236	.003
Nov. 23, 1874	Nov. 18, 1874	60.9	−1.745	−2.285	.540
Dec. 3, 1874	Nov. 28, 1874	59.2	−2.026	−2.868	.842
Dec. 13, 1874	Dec. 8, 1874	60.4	−1.910	−2.460	.550
Dec. 23, 1874	Dec. 18, 1874	57.2	−2.434	−2.649	.215
Jan. 2, 1875	Dec. 28, 1874	58.2	−2.325	−2.535	.210
Jan. 12, 1875	Jan. 7, 1875	52.6	−3.394	−3.520	.126
Jan. 22, 1875	Jan. 17, 1875	50.2	−3.977	−4.011	.034
Feb. 1, 1875	Jan. 27, 1875	54.3	−3.151	−3.338	.187
Feb. 11, 1875	Feb. 6, 1875	50.5	−4.007	−3.351	.656
Feb. 21, 1875	Feb. 16, 1875	50.5	−4.057	−3.318	.639
Mar. 3, 1875	Feb. 26, 1875	58.2	−2.625	−2.456	.169
Mar. 13, 1875	Mar. 8, 1875	59.	−2.555	−2.470	.085
Mar. 23, 1875	Mar. 18, 1875	59.9	−2.477	−2.448	.029
April 2, 1875	Mar. 28, 1875	61.6	−2.309	−1.993	.316
April 12, 1875	April 7, 1875	67.	−1.807	−1.316	.491
April 22, 1875	April 17, 1875	61.8	−2.385	−2.387	.002
May 2, 1875	April 27, 1875	62.3	−2.377	−1.864	.413
May 12, 1875	May 7, 1875	65.9	−2.085	−1.367	.718
May 22, 1875	May 17, 1875	69.3	−1.931	−1.000	.931
June 1, 1875	May 27, 1875	76.4	−1.928	−1.202	.726
June 11, 1875	June 6, 1875	74.5	−1.943	−1.259	.684
June 21, 1875	June 16, 1875	73.3	−1.989	−1.296	.693
July 1, 1875	June 26, 1875	83.3	−2.509	−1.859	.650
July 11, 1875	July 6, 1875	82.3	−2.467	−1.991	.556
July 21, 1875	July 16, 1875	81.3	−2.435	−1.974	.461
July 31, 1875	July 26, 1875	80.2	−2.407	−1.890	.517
Aug. 10, 1875	Aug. 5, 1875	77.5	−2.315	−1.793	.552
Aug. 20, 1875	Aug. 15, 1875	80.3	−2.513	−1.860	.653
Aug. 30, 1875	Aug. 25, 1875	74.3	−2.341	−1.817	.524
Sept. 9, 1875	Sept. 4, 1875	72.4	−2.396	−1.872	.524
Sept. 19, 1875	Sept. 14, 1875	78.6	−2.564	−1.830	.734
Sept. 29, 1875	Sept. 24, 1875	63.6	−2.989	−2.558	.431
Oct. 9, 1875	Oct. 4, 1875	67.9	−2.701	−2.321	.480

CHRONOMETER 1509 BARRAUD.

$t =$ October 14, 1875.

$$\left.\begin{array}{llcl} \text{1875, Oct. } 14: & +.562 & = & r + 0\,a - c\,(\theta^\circ - 65)^2 \\ \text{1876, Jan. } 12: & +.112 & = & r + 90\,a - c\,(\theta^\circ - 57)^2 \\ \text{1876, Apr. } 11: & +.833 & = & r + 180\,a - c\,(\theta^\circ - 60.5)^2 \\ \text{1876, July } 10: & -.488 & = & r + 270\,a - c\,(\theta^\circ - 86.1)^2 \end{array}\right\}\text{ Mean of 30 days.}$$

$$\text{Equation: } r' = +\,0^{\text{s}}.618 + .0034\,(t' - t) - .0064\,(68^\circ.3 - \theta')^2$$

Rate-day.	Mean date corresponding to rate.	θ'	Rate computed.	Rate observed.	Diff.
		°	s.	s.	
Nov. 8, 1875	Nov. 3, 1875	59.1	+0.144	+0.236	.092
Nov. 18, 1875	Nov. 13, 1875	60.2	+0.300	+0.330	.030
Nov. 28, 1875	Nov. 23, 1875	58.4	+0.127	+0.057	.030
Dec. 8, 1875	Dec. 3, 1875	53.9	−0.539	−0.246	.293
Dec. 18, 1875	Dec. 13, 1875	54.4	−0.426	−0.113	.313
Dec. 28, 1875	Dec. 23, 1875	56.0	−0.110	+0.073	.183
Jan. 7, 1876	Jan. 2, 1876	59.8	+0.429	+0.472	.043
Jan. 17, 1876	Jan. 12, 1876	54.2	−0.350	−0.381	.031
Jan. 27, 1876	Jan. 22, 1876	57.3	+0.184	+0.244	.060
Feb. 6, 1876	Feb. 1, 1876	53.9	−0.335	−0.221	.114
Feb. 16, 1876	Feb. 11, 1876	56.3	+0.104	+0.270	.166
Feb. 26, 1876	Feb. 21, 1876	54.3	−0.194	+0.087	.281
Mar. 7, 1876	Mar. 2, 1876	53.2	−0.365	+0.106	.471
Mar. 17, 1876	Mar. 12, 1876	57.9	+0.437	+0.665	.228
Mar. 27, 1876	Mar. 22, 1876	50.6	−0.841	−0.226	.615
April 6, 1876	April 1, 1876	56.0	+0.230	+0.335	.095
April 16, 1876	April 11, 1876	61.3	+0.916	+1.087	.171
April 26, 1876	April 21, 1876	62.4	+1.040	+1.078	.038
May 6, 1876	May 1, 1876	63.7	+1.164	+0.906	.258
May 16, 1876	May 11, 1876	69.5	+1.326	+0.999	.327
May 26, 1876	May 21, 1876	69.8	+1.347	+0.941	.406
June 5, 1876	May 31, 1876	73.8	+1.202	+0.721	.481
June 15, 1876	June 10, 1876	80.7	+0.448	+0.502	.054
June 25, 1876	June 20, 1876	79.2	+0.706	+0.340	.366
July 5, 1876	June 30, 1876	85.5	−0.392	−0.474	.082
July 15, 1876	July 10, 1876	88.	−0.947	−0.851	.096
July 25, 1876	July 20, 1876	84.7	−0.152	−0.141	.011
Aug. 4, 1876	July 30, 1876	77.	+1.120	+0.335	.785
Aug. 14, 1876	Aug. 9, 1876	81.	+0.606	−0.098	.704
Aug. 24, 1876	Aug. 19, 1876	79.6	+0.856	−0.059	.915
Sept. 3, 1876	Aug. 29, 1876	77.8	+1.128	+0.126	1.002
Sept. 13, 1876	Sept. 8, 1876	72.8	+1.610	+0.592	1.018
Sept. 23, 1876	Sept. 18, 1876	69.6	+1.764	+0.494	1.270
Oct. 3, 1876	Sept. 28, 1876	66.1	+1.778	+0.854	0.924
Oct. 13, 1876	Oct. 8, 1876	63.5	+1.695	+0.559	1.136
Oct. 23, 1876	Oct. 18, 1876	58.8	+1.299	+0.436	0.863
Nov. 2, 1876	Oct. 28, 1876	61.7	+1.631	+0.641	0.990
Nov. 12, 1876	Nov. 7, 1876	60.8	+1.843	+0.525	1.059

CHRONOMETER 775 NEGUS.

$t = \text{April } 12,\ 1874.$

$$\left.\begin{array}{lll} 1874,\ \text{Apr.} & 12: & +.362 = r + 0\,a - c\,(\theta^\circ - 61.1)^2 \\ 1874,\ \text{July} & 11: & +.436 = r + 90\,a - c\,(\theta^\circ - 83.8)^2 \\ 1874,\ \text{Oct.} & 9: & +.942 = r + 180\,a - c\,(\theta^\circ - 69.4)^2 \\ 1875,\ \text{Jan.} & 7: & -.738 = r + 270\,a - c\,(\theta^\circ - 54)^2 \end{array}\right\}\ \text{Mean of 30 days.}$$

$$\text{Equation: } r' = +\,1^{s}.050 - .0002\,(t' - t) - .0048\,(72^\circ.8 - \theta')^2$$

Rate-day.	Mean date corresponding to rate.	θ'	Rate computed.	Rate observed.	Diff.
		°	s.	s.	
May 7, 1874	May 2, 1874	63.5	+0.631	+0.979	.348
May 17, 1874	May 12, 1874	71.3	+1.032	+1.482	.450
May 27, 1874	May 22, 1874	69.8	+0.999	+1.276	.277
June 6, 1874	June 1, 1874	76.1	+0.988	+1.346	.358
June 16, 1874	June 11, 1874	81.2	+0.699	+0.170	.529
June 26, 1874	June 21, 1874	80.	+0.787	+0.908	.121
July 6, 1874	July 1, 1874	84.6	+0.366	+0.255	.111
July 16, 1874	July 11, 1874	84.	+0.831	+0.544	.287
July 26, 1874	July 21, 1874	82.9	+0.540	+0.508	.068
Aug. 5, 1874	July 31, 1874	79.7	+0.800	+1.107	.307
Aug. 15, 1874	Aug. 10, 1874	80.2	+0.763	+1.047	.284
Aug. 25, 1874	Aug. 20, 1874	81.4	+0.669	+0.880	.211
Sept. 4, 1874	Aug. 30, 1874	73.6	+1.019	+0.876	.143
Sept. 14, 1874	Sept. 9, 1874	79.3	+0.817	+0.804	.013
Sept. 24, 1874	Sept. 19, 1874	74.8	+0.999	+0.577	.422
Oct. 4, 1874	Sept. 29, 1874	72.	+1.013	+0.966	.047
Oet. 14, 1874	Oct. 9, 1874	69.5	+0.972	+0.978	.006
Oct. 24, 1874	Oct. 19, 1874	66.8	+0.839	+0.895	.056
Nov. 3, 1874	Oct. 29, 1874	67.5	+0.875	+0.954	.079
Nov. 13, 1874	Nov. 8, 1874	65.3	+0.738	+0.764	.026
Nov. 23, 1874	Nov. 18, 1874	60.9	+0.326	+0.065	.261
Dec. 3, 1874	Nov. 28, 1874	59.2	+0.116	−0.118	.234
Dec. 13, 1874	Dec. 8, 1874	60.4	+0.264	+0.140	.124
Dec. 23, 1874	Dec. 18, 1874	57.2	−0.168	−0.299	.131
Jan. 2, 1875	Dec 28, 1874	58.2	−0.025	+0.015	.040
Jan. 12, 1875	Jan. 7, 1875	52.6	−0.962	−0.820	.142
Jan. 22, 1875	Jan. 17, 1875	50.2	−1.457	−1.411	.046
Feb. 1, 1875	Jan. 27, 1875	54.3	−0.651	−0.488	.163
Feb. 11, 1875	Feb. 6, 1875	50.5	−1.397	−1.101	.296
Feb. 21, 1875	Feb. 16, 1875	50.5	−1.399	−1.068	.331
Mar. 3, 1875	Feb. 26, 1875	58.2	−0.037	+0.248	.285
Mar. 13, 1875	Mar. 8, 1875	59.	+0.070	+0.530	.460
Mar. 23, 1875	Mar. 18, 1875	59.9	+0.183	+0.352	.169
April 2, 1875	Mar. 28, 1875	61.6	+0.378	+0.757	.379
April 12, 1875	April 7, 1875	68.0	+0.817	+1.334	.517
April 22, 1875	April 17, 1875	61.8	+0.405	+0.813	.408
May 2, 1875	April 27, 1875	62.3	+0.445	+1.036	.591
May 12, 1875	May 7, 1875	65.9	+0.744	+1.483	.739
May 22, 1875	May 17, 1875	69.3	+0.911	+1.800	.889
June 1, 1875	May 27, 1875	76.4	+0.906	+1.548	.642
June 11, 1875	June 6, 1875	74.5	+0.922	+1.691	.769
June 21, 1875	June 16, 1875	73.3	+0.963	+1.804	.841
July 1, 1875	June 26, 1875	83.3	+0.433	+1.241	.808
July 11, 1875	July 6, 1875	82.3	+0.527	+1.189	.662

CHRONOMETER 6604 FRENCH.

$t =$ October 14, 1875.

$$\left.\begin{array}{l}1875, \text{Oct. } 14: -2.738 = r + 0\,a - c\,(\theta^\circ - 65)^2 \\ 1876, \text{Jan. } 12: -3.485 = r + 90\,a - c\,(\theta^\circ - 57)^2 \\ 1876, \text{Apr. } 11: -2.717 = r + 180\,a - c\,(\theta^\circ - 60.5)^2 \\ 1876, \text{July } 10: -3.205 = r + 270\,a - c\,(\theta^\circ - 86.1)^2\end{array}\right\} \text{Mean of 30 days.}$$

$$\text{Equation}: r' = -2^s.536 + .0026\,(t' - t) - .006\,(71^\circ - \theta')^2$$

Rate-day.	Mean date corresponding to rate.	θ'	Rate computed.	Rate observed.	Diff.
		°	s.	s.	
Nov. 8, 1875	Nov. 3, 1875	59.1	−3.336	−3.214	.122
Nov. 18, 1875	Nov. 13, 1875	60.2	−3.160	−3.020	.140
Nov. 28, 1875	Nov. 23, 1875	58.4	−3.386	−3.443	.057
Dec. 8, 1875	Dec. 3, 1875	53.9	−4.158	−3.846	.312
Dec. 18, 1875	Dec. 13, 1875	54.4	−4.036	−3.733	.303
Dec. 28, 1875	Dec. 23, 1875	56.0	−3.704	−3.577	.127
Jan. 7, 1876	Jan. 2, 1876	59.8	−3.080	−3.078	.002
Jan. 17, 1876	Jan. 12, 1876	54.2	−3.935	−3.981	.046
Jan. 27, 1876	Jan. 22, 1876	57.3	−3.404	−3.406	.002
Feb. 6, 1876	Feb. 1, 1876	53.9	−4.002	−3.921	.081
Feb. 16, 1876	Feb. 11, 1876	56.3	−3.688	−3.230	.458
Feb. 26, 1876	Feb. 21, 1876	54.3	−3.872	−3.563	.309
Mar. 7, 1876	Mar. 2, 1876	53.2	−4.074	−3.644	.430
Mar. 17, 1876	Mar. 12, 1876	57.9	−3.176	−2.985	.191
Mar. 27, 1876	Mar. 22, 1876	50.6	−4.616	−3.776	.840
April 6, 1876	April 1, 1876	56.0	−3.444	−3.215	.229
April 16, 1876	April 11, 1876	61.3	−2.632	−2.513	.119
April 26, 1876	April 21, 1876	62.4	−2.486	−2.422	.064
May 6, 1876	May 1, 1876	63.7	−2.334	−2.394	.060
May 16, 1876	May 11, 1876	69.5	−2.002	−2.101	.099
May 26, 1876	May 21, 1876	69.8	−1.972	−2.309	.337
June 5, 1876	May 31, 1876	73.8	−1.986	−2.179	.193
June 15, 1876	June 10, 1876	80.7	−2.470	−2.298	.178
June 25, 1876	June 20, 1876	79.2	−2.288	−2.710	.422
July 5, 1876	June 30, 1876	85.5	−3.060	−3.174	.114
July 15, 1876	July 10, 1876	88.0	−2.968	−3.401	.433
July 25, 1876	July 20, 1876	84.7	−2.936	−3.041	.105
Aug. 4, 1876	July 30, 1876	77.0	−1.998	−1.865	.133
Aug. 14, 1876	Aug. 9, 1876	81.0	−2.356	−3.198	.842
Aug. 24, 1876	Aug. 19, 1876	79.6	−2.174	−3.459	1.285
Sept. 3, 1876	Aug. 29, 1876	77.8	−1.981	−3.074	1.093
Sept. 13, 1876	Sept. 8, 1876	72.8	−1.717	−2.308	.591
Sept. 23, 1876	Sept. 18, 1876	69.6	−1.664	−2.306	.642
Oct. 3, 1876	Sept. 28, 1876	66.1	−1.770	−2.646	.876
Oct. 13, 1876	Oct. 8, 1876	63.5	−1.937	−2.091	.154
Oct. 23, 1876	Oct. 18, 1876	58.5	−2.467	−2.764	.297
Nov. 2, 1876	Oct. 28, 1876	61.7	−2.067	−2.459	.392
Nov. 12, 1876	Nov. 7, 1876	60.8	−2.148	−2.675	.427

An examination of these tables shows that, between the limits of observation, the changes in the computed rates do correspond, though not always closely, with the changes in the actual observed rates, and that between certain limits of observation the formula offers a method of *weighing* chronometer observations.

For example, in the case of 1509 Barraud the error of carrying forward the observed rate of October 29, 1875 ($+ 0^s.630$), to December 18, 1875, would be $29^s.06$ in the chronometer correction, while the error of adopting the rates computed by the formula would be $7^s.38$. One observed rate being had on October 29, 1875, and one on January 27, 1876, the error of adopting the mean of these observed rates for computing the chronometer correction on December 18, 1875, would be $19^s.41$, while the error of adopting the *mean correction* given by computed rates would only be $2^s.44$.

Beyond the limits of observation, the predictions of rates are unreliable in most cases. They depend on the degree of reliance to be placed on the values of r and a. It has been shown that these values are not reliable for long periods, but that the values of θ and c may be depended on as constant for some time. This has been verified by a recomputation of the constants. If, then, it is desirable to predict changes of rate with more certainty, we may form, from our observations, new equations of condition with only two unknown quantities, r and a, retaining the old values of θ and c. This will necessitate only two equations in which great differences of temperature are not necessary, and the intervals of time must be as long as circumstances will permit.

M. Lieussou, in commenting on the results of his work, accounts for the discrepancies of prediction by the inference that the lines of isothermal rates are not in reality straight lines, but arcs of parabolas, and proposes to modify his formula, in cases requiring it, by the introduction of a term depending on $(t' - t)^2$.

It is not necessary to follow the subject any further at this point. The remarks of the last two paragraphs will be taken up again in the discussion of the *general equation of the chronometer.*

THE FORMULA OF YVON VILLARCEAU.

M. Yvon Villarceau, astronomer at the Paris observatory, in an article published in "Annales de l'Observatoire Impérial de Paris, Mémoires, tome vii," discusses at length the whole subject of chronometers. His remarks on the subject of a formula for predetermining the rates of chronometers are as follows:

"The theory of any phenomenon has for an object the determination of relations which exist between certain functions and the variables on which they depend. It is not always possible to obtain these relations, but it may be requisite to know not only the analytical expression of these functions, but the numerical value of their variations between determined limits. We may generally solve the problem by means of Taylor's theorem. It is only necessary that between these limits the functions should not be subject to sudden variations. In the doubt which may exist in any case it is always convenient to try the application of the theorem, for the comparison of the results obtained with observations corresponding to values of the variables sufficiently near will always show, *a posteriori*, whether we have a case of exception.

"Let, for instance, r' be a function of two variables, t' and θ', r the value of the function corresponding to the particular values t and θ of t' and θ'; Taylor's theorem gives

$$\left\{\begin{aligned} &r' = r + \frac{dr}{dt}(t'-t) + \frac{dr}{d\theta}(\theta'-\theta) + \frac{d^2r}{d\theta^2}\left(\frac{\theta'-\theta}{1\cdot 2}\right)^2 \\ &+ \frac{d^2r}{dt\,d\theta}\left(\frac{t'-t}{1}\right)\left(\frac{\theta'-\theta}{1}\right) + \frac{d^2r}{dt^2}\left(\frac{t'-t}{1\cdot 2}\right)^2 + \cdots\cdots\cdots \end{aligned}\right. \tag{2}$$

"We may seek to obtain directly the derivatives of the function r with regard to t and θ which this expression contains, since the form of r is by hypothesis unknown Then we are led to borrow from observation the necessary data for the determination of their numerical values. Admitting that observation has given several systems of corresponding values of r', t', and θ', the preceding equation being applied to each one of these systems, we will have as many equations of observation, which would serve to obtain as many unknown quantities, if it was not necessary to take into account errors of observation, and if, besides, the terms depending on the coëfficients not determined could be neglected.

"The values of t and θ being arbitrary, it will do to take them at about the middle of the intervals comprised between the assigned limits of the variables, or better, to take for t and θ the respective means of the observed values of t' and θ'."

We may, therefore, accept Taylor's theorem as a rigorous method of solving the problem, *provided always* that we may assume the change of rate due to lapse of time and incidental causes to be regular. It is well to remark that the formulæ of M. Lieussou and others are, to a certain extent, identical with that of M. Yvon Villarceau. M. Lieussou has taken into account terms proportional to the time and the first two powers of the temperature. He has even indicated the possibility of taking into account, in certain cases, terms depending on the square of the times. M. le Capitaine Pagel has introduced a term depending on the product of the time and temperature (Recherches Chronométriques, v^e cahier). These formulæ all contain terms of Taylor's series, the series being carried further in some cases than in others.

In other words, if, as M. Lieussou assumes, the lines of isothermal rates are straight lines and parallel to each other, his formula is exact; if the lines are tangents to a parabola or other line of regular curvature, we should, by using a sufficient number of terms of Taylor's series, be able to assign to each chronometer its proper equation. But if, on the other hand, the lines are neither parallel nor tangents to any regular curve, if their direction is affected by causes purely anomalous, we cannot depend with certainty on any of these equations. The latter we know to be the case, and we may therefore conclude that no formula yet proposed will give perfectly reliable results. In fact, it is not possible that any formula could meet the requirements of the case, for the reason already stated, viz, that changes of rate are due not only to change of temperature and lapse of time, both of which may be regular elements of change, but also to accidental and anomalous causes, such as shocks received in transportation, motion of a ship, etc., and to causes little understood and intricate, such as condition of the oil used in lubricating, polarity of balance, etc.

M. A. de Magnac, lieutenant de vaisseau in the French navy, has adapted the formula of M. Yvon Villarceau to chronometers afloat, and his results are published in "Recherches sur les Chronomètres, cahier ix".

His method has been followed with three chronometers at the Observatory, and a description of this method, with the results obtained, is here given.

Cauchy's method of interpolation, adopted in this case as particularly applicable, is an extension of the theory of arithmetical means for the compensation for errors equally possible. Given, by observation, erroneous values of certain variables, to see if we can represent easily by the terms of a series, and within certain limits, a function depending thereon.

Let the equations

$$(3)\qquad \begin{cases} Aa + Bb + Cc + \;\ldots\ldots = r \\ A'a + B'b + C'c + \;\ldots\ldots = r' \\ A''a + B''b + C''c + \;\ldots\ldots = r'' \\ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \end{cases}$$

represent equations of condition greater in number than the unknown quantities to be determined. The first members come from the development of a series, but are written as above for simplicity. The coëfficients

$A, A', A'', \ldots\ldots\ldots\; B, B', B'', \ldots\ldots\ldots\; C, C', C'', \ldots\ldots\ldots$

of these equations may be affected by errors of observation. These errors are generally insensible. On the contrary, the observed quantities $r, r', r'', \ldots\ldots$ are almost always affected by important errors, of which it is necessary to avoid the influence on the values of the unknown quantities $a, b, c \ldots$ We do not know how many terms of the series may be necessary; perhaps one will suffice. Reduce the *first members* of the equations to the first term (making the other coëfficient 0): we have

$$\begin{aligned} Aa &= r \\ A'a &= r' \\ A''a &= r'' \\ &\ldots\ldots \end{aligned}$$

Take the sum of these equations, member for member,

$$(A + A' + A'')\,a = r + r' + r''$$

or, to abbreviate, write

$$a\Sigma A = \Sigma r$$

$$a = \frac{\Sigma r}{\Sigma A}$$

The errors are partly destroyed in the two sums; but if the coëfficients A, A′, A″, have contrary signs, it may happen that ΣA is nothing or very small. In the first case, according as the value of Σr is finite or 0, we would have $a = \infty$, or $a = \frac{0}{0}$, two results which cannot represent the solution of the problem proposed. In the second case, the remainder of the errors not destroyed would be divided by a very small quantity, consequently the error only a little reduced. Now we will evidently avoid these difficulties by substituting for ΣA a sum always finite, SA, which we seek to make as great as possible. We accomplish this without disturbing existing relations by giving A the same sign throughout, which is done by changing the signs of certain equations. This operation being performed, we have a new equation:

$$a\mathrm{S}A = \mathrm{S}r$$

$$a = \frac{\mathrm{S}r}{\mathrm{S}A}$$

It must be noticed that the greater the number of equations the greater the chance of eliminating errors. The greater SA the greater the probability of exactitude in the result. Therefore it is an advantage to have as many observations as possible.

We have obtained a; multiply it successively by A, A′, A″, ... , and subtract these products from r, r', r'', . . . , we obtain certain differences,

$$r - \mathrm{A}\frac{\mathrm{S}r}{\mathrm{SA}}, \qquad r' - \mathrm{A}\frac{\mathrm{S}r'}{\mathrm{SA}}, \qquad r'' - \mathrm{A}\frac{\mathrm{S}r''}{\mathrm{SA}}, \qquad \ldots\ldots$$

If these quantities are very small, and within the limit of error of observation, either a is exact, for if it is exact we should find just such differences as we are supposing, or the error of taking a alone of the series is less than the possible error of observation, consequently inappreciable with the means which we possess. It suffices, then, in this case, not to push the investigation further.

Suppose, now, that the remainders $r - \frac{\mathrm{AS}r}{\mathrm{SA}},$ etc., are greater than the limit of error of observation; a alone will not suffice, but a and b may perhaps. Let us return to the equations (3), using the first two terms of the first members,

$$(4) \qquad \begin{cases} \mathrm{A}a + \mathrm{B}b = r \\ \mathrm{A}'a + \mathrm{B}'b = r' \\ \mathrm{A}''a + \mathrm{B}''b = r'' \end{cases}$$

we must eliminate a. Add the equations member for member, we have

$$a\mathrm{SA} + b\,\mathrm{SB} = \mathrm{S}r$$

The errors are not destroyed as much as possible in the sums S; divide by SA:

$$(5) \qquad a + \frac{\mathrm{SB}}{\mathrm{SA}}b = \frac{\mathrm{S}r}{\mathrm{SA}}$$

We have given A the same sign in all the equations. According to what we have already seen, the errors in equation (5) must be greatly reduced. Multiply by A, A′, A″, we have

$$\begin{aligned} \mathrm{A}a + \mathrm{A}\frac{\mathrm{SB}}{\mathrm{SA}}b &= \mathrm{A}\frac{\mathrm{S}r}{\mathrm{SA}} \\ \mathrm{A}'a + \mathrm{A}'\frac{\mathrm{SB}}{\mathrm{SA}}b &= \mathrm{A}'\frac{\mathrm{S}r}{\mathrm{SA}} \\ \mathrm{A}''a + \mathrm{A}''\frac{\mathrm{SB}}{\mathrm{SA}}b &= \mathrm{A}''\frac{\mathrm{S}r}{\mathrm{SA}} \\ &\ldots\ldots\ldots\ldots \end{aligned}$$

It is very probable that the errors of these equations are still small. Subtract them, member for member, from equations (4). We obtain the following, in which a has disappeared, and in which the primitive errors affecting the several coëfficients will not have sensibly changed:

$$(6) \qquad \begin{cases} \left(\mathrm{A}\frac{\mathrm{SB}}{\mathrm{SA}} - \mathrm{B}\right)b = \mathrm{A}\frac{\mathrm{S}r}{\mathrm{SA}} - r \\ \left(\mathrm{A}'\frac{\mathrm{SB}}{\mathrm{SA}} - \mathrm{B}'\right)b = \mathrm{A}'\frac{\mathrm{S}r}{\mathrm{SA}} - r' \\ \left(\mathrm{A}''\frac{\mathrm{SB}}{\mathrm{SA}} - \mathrm{B}''\right)b = \mathrm{A}''\frac{\mathrm{S}r}{\mathrm{SA}} - r'' \end{cases}$$

To get the value of b we are led to the same reasoning as in supposing the equations reduced to Aa, A$'a$, etc. Having b, we substitute its value in equations (6), we substract the results from their second members, and, according as the results are greater or less than the limit of error of observation, we are led to stop at b, or to proceed to eliminate c, d, e, until we arrive at second members of the desired value.

If we stop at b, by substituting its value in (5) we get a. In the same way, if it is necessary to obtain the values of several other unknown quantities, c, d, e, by substituting them in the various equations of the form of (5) successively, we will get all the values we need for the proposed system.

There is one more remark to make, important because it facilitates computation. Reducing to a common denominator in (6),

$$\frac{A\,.\,SB - B\,.\,SA}{SA}\,b = \frac{A\,.\,Sr - r\,.\,SA}{SA}$$
$$\frac{A'\,.\,SB - B'\,.\,SA}{SA}\,b = \frac{A'\,.\,Sr - r'\,.\,SA}{SA}$$
$$\frac{A''.\,SB - B''.\,SA}{SA}\,b = \frac{A''.\,Sr - r''.\,SA}{SA}$$
$$\cdots\cdots\cdots\cdots\cdots$$

Taking the sum of these equations, member for member, we have

$$\frac{(A + A' + A'' + \dots)\,SB - (B + B' + B'' + \dots)\,SA}{SA}\,b$$
$$= \frac{(A + A' + A'' + \dots)\,Sr - (r + r' + r'' + \dots)\,SA}{SA}$$
$$\text{or } \frac{SA\,.\,SB - SB\,.\,SA}{SA}\,b = \frac{SA\,.\,Sr - Sr\,.\,SA}{SA}$$

The numerators of these equations being o, without their denominators being o, they are equal to o. Consequently, when we have eliminated an unknown quantity, we must make the sum of the resulting equations, and should find each coëfficient o, saving the errors arising from neglected decimals.

We now proceed to the practical application of this method to three chronometers, 991 Negus, 273 Bond, and 953 Negus.

Turning to equation (2), we find the quantities to be determined to be certain coëfficients of $(t' - t)$, $(\theta' - \theta)$, $\left(\frac{(\theta' - \theta)}{2}\right)^2$, etc., which we simplify by representing them successively by the letters a, b, c, d, e. The rate r at the date t and the temperature θ is an initial rate, corresponding to an adopted time and temperature. The rate r' at the temperature θ' and date t' is given by observation. We may, therefore, write our equation

$$(7)\quad r' = r + (t' - t)\,a + (\theta' - \theta)\,b + \frac{(\theta' - \theta)^2}{2}\,c + (\theta' - \theta)\,(t' - t)\,d + \frac{(t' - t)^2}{2}\,e$$

The following table is taken from the records of the three chronometers:

Rate-day.	Mean date corresponding to rate. (t')	Rates observed. (r')			Mean temperature. (θ')
		991 Negus.	273 Bond.	953 Negus.	
		s.	s.	s.	°
Jan. 2, 1875	1874, Dec. 28	+0.215	−0.335	+1.765	58.2
Jan. 12, 1875	1875, Jan. 7	−0.470	−0.770	+1.480	52.6
Jan. 22, 1875	1875, Jan. 17	−0.771	−0.961	+1.089	50.2
Feb. 1, 1875	1875, Jan. 27	+0.162	−0.588	+1.712	54.3
Feb. 11, 1875	1875, Feb. 6	−0.501	−0.701	+1.399	50.5
Feb. 21, 1875	1873, Feb. 16	−0.318	−0.668	+1.332	50.5
Mar. 3, 1875	1875, Feb. 26	+0.798	−0.402	+1.948	58.2
Mar. 13, 1875	1875, Mar. 8	+1.030	−0.270	+1.780	59.
Mar. 23, 1875	1875, Mar. 18	+0.202	−0.298	+1.552	59.9
April 2, 1875	1875, Mar. 28	+0.407	−0.193	+1.857	61.6
April 12, 1875	1875, April 7	+0.734	−0.266	+2.234	67.
April 22, 1875	1875, April 17	+0.113	−0.237	+1.813	61.8
May 2, 1875	1875, April 27	+0.136	−0.164	+2.136	62.3
May 12, 1875	1875, May 7	+0.333	−0.317	+1.983	65.9
May 22, 1875	1875, May 17	+0.500	−0.450	+1.950	69.3
June 1, 1875	1875, May 27	+0.598	−1.102	+1.498	76.4
June 11, 1875	1875, June 6	+0.591	−1.059	+1.591	74.5
June 21, 1875	1875, June 16	+0.604	−1.046	+1.454	73.3
July 1, 1875	1875, June 26	+0.191	−1.609	+0.441	83.3
July 11, 1875	1875, July 6	+0.039	−1.561	+0.339	82.3
July 21, 1875	1875, July 16	+0.024	−1.574	+0.226	81.3

The columns of this table give the values of t', r', and θ'. We adopt for our value of t May 17, 1875, and for θ the corresponding value 69°.3. Substituting the proper values of t, t', θ, θ', and r' in our equation (7), we will have the following series of equations from which to determine r, a, b, c, d, and e. In order to make the values of the coëfficients small, we call 10 days the unit of time.

	991 Negus.	273 Bond.	953 Negus.
(1) $r - 14.0\,a - 11.1\,b + 61.6\,c + 155.4\,d + 103.0\,e =$	+0.215	−0.335	+1.765
(2) $r - 13.0\,a - 16.7\,b + 139.4\,c + 217.1\,d + 84.5\,e =$	−0.470	−0.770	+1.480
(3) $r - 12.0\,a - 19.1\,b + 182.4\,c + 229.2\,d + 72.0\,e =$	−0.711	−0.961	+1.089
(4) $r - 11.0\,a - 15.0\,b + 112.5\,c + 165.0\,d + 60.5\,e =$	+0.162	−0.588	+1.712
(5) $r - 10.0\,a - 18.8\,b + 176.7\,c + 188.0\,d + 50.0\,e =$	−0.501	−0.701	+1.399
(6) $r - 9.0\,a - 18.8\,b + 176.7\,c + 169.2\,d + 40.5\,e =$	−0.318	−0.668	+1.332
(7) $r - 8.0\,a - 11.1\,b + 61.6\,c + 88.8\,d + 32.0\,e =$	+0.798	−0.402	+1.948
(8) $r - 7.0\,a - 10.3\,b + 53.0\,c + 72.1\,d + 24.5\,e =$	+1.030	−0.270	+1.780
(9) $r - 6.0\,a - 9.4\,b + 44.2\,c + 56.4\,d + 18.0\,e =$	+0.202	−0.298	+1.552
(10) $r - 5.0\,a - 7.7\,b + 29.6\,c + 38.5\,d + 12.5\,e =$	+0.404	−0.193	+1.857
(11) $r - 4.0\,a - 2.3\,b + 2.6\,c + 9.2\,d + 8.0\,e =$	+0.734	−0.226	+2.234
(12) $r - 3.0\,a - 7.5\,b + 28.1\,c + 22.5\,d + 4.5\,e =$	+0.113	−0.237	+1.813
(13) $r - 2.0\,a - 7.0\,b + 24.5\,c + 14.0\,d + 2.0\,e =$	+0.136	−0.164	+2.136
(14) $r - 1.0\,a - 3.4\,b + 5.8\,c + 3.4\,d + 0.5\,e =$	+0.333	−0.317	+1.983
(15) $r + 1.0\,a + 7.1\,b + 25.2\,c + 7.1\,d + 0.5\,e =$	+0.598	−1.102	+1.498
(16) $r + 2.0\,a + 5.2\,b + 13.5\,c + 10.4\,d + 2.0\,e =$	+0.591	−1.059	+1.594
(17) $r + 3.0\,a + 4.0\,b + 8.0\,c + 12.0\,d + 4.5\,e =$	+0.604	−1.046	+1.454
(18) $r + 4.0\,a + 14.0\,b + 98.0\,c + 56.0\,d + 8.0\,e =$	+0.191	−1.609	+0.441
(19) $r + 5.0\,a + 13.0\,b + 84.5\,c + 65.0\,d + 12.5\,e =$	+0.039	−1.561	+0.339
(20) $r + 6.0\,a + 12.0\,b + 72.0\,c + 72.0\,d + 18.0\,e =$	+0.024	−1.574	+0.226

In these equations the observations are at equal intervals of 10 days. If such were not the case it would be necessary to reduce them to a common weight. This would be done by dividing each equation through by the number of days in the interval used in determining the rate.

We proceed to eliminate r. Its sign is positive in all the equations. We therefore add the equations, member for member, and write the result as follows, calling the sum of the first terms SA, the second SB, etc.:

$$\overset{\mathrm{SA}}{20\,r} - \overset{\mathrm{SB}}{84\,a} - \overset{\mathrm{SC}}{102.9\,b} + \overset{\mathrm{SD}}{1399.9\,c} + \overset{\mathrm{SE}}{1651.3\,d} + \overset{\mathrm{SF}}{558\,e} = \overset{\mathrm{S}r}{+\,4.177}\,;\ \overset{\mathrm{S}r}{-\,14.081}\,;\ \overset{\mathrm{S}r}{+\,29.629}.$$

The process of elimination is performed by means of logarithms, and is too lengthy to give in detail. The description will suffice. Write across the top of a sheet of paper the logarithms of SA, SB, SC, ... , Sr. Compute logs. $\frac{\mathrm{SB}}{\mathrm{SA}}$, $\frac{\mathrm{SC}}{\mathrm{SB}}$, $\frac{\mathrm{SD}}{\mathrm{SC}}$, ... , $\frac{\mathrm{S}r}{\mathrm{SF}}$, and write them in a line under the above On another piece of paper, or in a side column, write the logarithms of the coëfficients of the first terms (log A, log A′, log A″, etc.). Turn to the first sheet, and write log A under log $\frac{\mathrm{SB}}{\mathrm{SA}}$; add them, and write the sum under log $\frac{\mathrm{SC}}{\mathrm{SB}}$; add these two, and write their sum under log $\frac{\mathrm{SD}}{\mathrm{SC}}$, and so on to the end of the line.* We have in these sums all the logarithms necessary for the elimination of the first term in the first equation. Take from the tables the numbers corresponding to these logarithms, and subtract them, in the order in which they are written, from the coëfficients of the first equation, *beginning at the second term.* The resulting equation is the first equation of the second series, in which the first term has disappeared. Proceed with log A′ in the same way as with log A and we will get the second equation, and so on with logs A″, A‴, etc.

In the present case, the coëfficient of the first term, r, is unity in all the equations; A, A′, A″, etc., are, therefore, the same, and the process will have to be gone through with only once. The resulting numbers, subtracted from the coëfficients in the first series of equations, give the following series, in which r has disappeared.

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*To verify the additions thus far performed, compute log $\frac{\mathrm{S}r}{\mathrm{SA}}$, and add it to log A. The sum should be the same as the last logarithm of the line.

Equations resulting from the elimination of r.

	991 Negus.	273 Bond.	953 Negus.
(1) $- 9.8\,a - 6.\ b - 8.4\,c + 72.8\,d + 75.1\,e =$	+ .006	+ .369	+ .283
(2) $- 8.8\,a - 11.6\,b + 69.4\,c + 134.5\,d + 56.6\,e =$	− .679	− .066	− .002
(3) $- 7.8\,a - 14.\ b + 112.4\,c + 146.6\,d + 44.1\,e =$	− .920	− .257	− .393
(4) $- 6.8\,a - 9.9\,b + 52.5\,c + 82.4\,d + 32.6\,e =$	− .047	+ .116	+ .230
(5) $- 5.8\,a - 13.7\,b + 106.7\,c + 105.4\,d + 22.1\,e =$	− .710	+ .003	− .083
(6) $- 4.8\,a - 13.7\,b + 106.7\,c + 86.6\,d + 12.6\,e =$	− .527	+ .036	− .149
(7) $- 3.8\,a - 6.\ b - 8.4\,c + 6.2\,d + 4.1\,e =$	+ .589	+ .302	+ .466
(8) $- 2.8\,a - 5.2\,b - 17.0\,c - 10.5\,d - 3.4\,e =$	+ .821	+ .434	+ .298
(9) $- 1.8\,a - 4.3\,b - 25.8\,c - 26.2\,d - 9.9\,e =$	− .007	+ .406	+ .070
(10) $- 0.8\,a - 2.6\,b - 40.4\,c - 44.1\,d - 15.4\,e =$	+ .198	+ .511	+ .375
(11) $+ 0.2\,a + 2.8\,b - 67.4\,c - 73.4\,d - 19.9\,e =$	+ .525	+ .478	+ .752
(12) $+ 1.2\,a - 2.4\,b - 41.9\,c - 60.1\,d - 23.1\,e =$	− .096	+ .467	+ .331
(13) $+ 2.2\,a - 1.9\,b - 45.5\,c - 68.6\,d - 25.9\,e =$	− .073	+ .540	+ .654
(14) $+ 3.2\,a + 1.7\,b - 64.5\,c - 79.2\,d - 27.4\,e =$	+ .124	+ .387	+ .501
(15) $+ 5.2\,a + 12.2\,b - 44.8\,c - 75.5\,d - 27.4\,e =$	+ .389	− .398	+ .016
(16) $+ 6.2\,a + 10.3\,b - 56.5\,c - 72.2\,d - 25.9\,e =$	+ .382	− .355	+ .109
(17) $+ 7.2\,a + 9.1\,b - 62\;0\,c - 70.6\,d - 23.4\,e =$	+ .395	− .342	− .028
(18) $+ 8.2\,a + 19.1\,b + 18.0\,c - 26.6\,d - 19.9\,e =$	− .018	− .905	−1.041
(19) $+ 9.2\,a + 18.1\,b + 14.5\,c - 17.6\,d - 15.4\,e =$	− .170	− .857	−1.143
(20) $+ 10.2\,a + 17.1\,b + 2.0\,c - 10.6\,d - 9.9\,e =$	− .185	− .870	−1.256
+53.0 +90.4 +482.2 +634.5 +247.2 −53.0 −91.3 −482.6 −635.2 −246.9	+3.429 −3.432	+4.049 −4.050	+4.085 −4.095
00.0 −00.9 −000.4 −000.7 +000.3	−0.003	−0.001	−0.010

To verify the work, add these equations, member for member. We must find each coëfficient of the sum equal to zero, saving the error of neglected decimals, which ought not to exceed 20 of the lowest place involved. We proceed in the same manner to eliminate *a*, only we must here change the signs of the first ten equations in order to give the first term the same sign throughout (see page 16).

It is unnecessary to follow the work any farther by giving the succeeding series of equations. Enough has been given to show how the operations of elimination are performed. We are only interested in the second members of the equations at present. These we designate by $\varDelta_1$, $\varDelta_2$, $\varDelta_3$, $\varDelta_4$, etc. When, by the elimination of successive unknown quantities, we arrive at values of $\varDelta$ equal to or less than the probable error of observation, we know that the series so far complete will be sufficient for our purpose.

The errors of observation entering into a chronometer error, in this case, are:

1st. Error of comparison.

2d. Error of assumed clock correction.

The errors of observation in determining the clock correction are so small that we may neglect them altogether; but as several days sometimes elapse between these observations, during which time the clock may have changed its rate sensibly, and as a rate-day may occur at an equal interval between these two observations, the error of the clock correction on a rate-day may possibly be as great as $0^s.1$.

The first, or error of comparison, may be as great as $0^s.45$.

The resulting mean error of a chronometer error will therefore be

$$\pm \sqrt{(\pm 0.45)^2 + (\pm 0.1)^2} = \pm 0.46$$

If, now, we consider two chronometer errors whose difference divided by 10 determines the rate, the mean error of a chronometer rate will be

$$\frac{\pm 0.46 \sqrt{2}}{10} = \pm 0^s.065$$

Its maximum may be taken at double this value, or ± $0^s.13$.

Again, there may be a sensible error in the observations of temperature, which would affect the terms depending thereon. Admitting this to be as great as 1° in the mean result, we may allow for it by computing the variation due to 1° difference of temperature by means of the formula of M. Lieussou. This has been done in the case of 991 Negus and 273 Bond. Taking the mean variation due to 1° change of temperature between the limits 40° and 80°, we have for 991 Negus ± $0^s.02$, and for 273 Bond ± $0^s.04$.

These results seem to show that this error is so small that it may be neglected in the case of a well compensated chronometer.

Unless, therefore, we arrive at values of Δ less than or equal to $0^s.1$, or, at the outside, $0^s.2$, we must conclude that the formula will not give good results.

In the case of the three chronometers under consideration, the values of Δ are given in the following tables:

991 NEGUS.

Date.	Δ_1	Δ_2	Δ_3	Δ_4	Δ_5	Δ_6
1874, Dec. 28	+ .006	− .241	+ .058	+ .538	− .429	+ .109
1875, Jan. 7	− .679	+ .467	− .518	+ .455	− .194	+ .395
Jan. 17	− .920	+ .733	+ .709	− .259	− .145	+ .281
Jan. 27	− .047	− .116	+ .094	+ .141	− .140	− .129
Feb. 6	− .710	+ .575	+ .498	+ .026	+ .074	− .006
Feb. 16	− .527	+ .412	+ .304	+ .281	− .070	+ .310
Feb. 26	+ .589	− .680	+ .676	− .435	− .417	− .278
Mar. 8	+ .821	− .887	− .898	− .648	− .607	− .482
Mar. 18	− .007	− .036	− .051	+ .198	+ .247	+ .347
Mar. 28	+ .198	− .217	− .241	+ .077	+ .124	+ .224
April 7	+ .525	+ .520	+ .474	+ .020	+ .193	+ .265
April 17	− .096	− .125	+ .047	+ .259	+ .273	− .219
April 27	− .073	− .126	+ .027	+ .209	− .194	− .058
May 7	+ .124	+ .047	− .111	+ .175	− .090	+ .112
May 27	+ .389	+ .264	+ .197	− .092	+ .165	− .111
June 6	+ .382	+ .233	+ .229	− .114	+ .201	− .093
June 16	+ .395	+ .222	− .269	− .183	+ .497	− .404
June 26	− .018	− .215	− .319	+ .154	+ .174	− .063
July 6	− .170	− .391	− .448	+ .066	− .023	+ .062
July 16	− .185	− .440	− .449	+ .042	+ .361	− .264

273 BOND.

Date.	Δ_1	Δ_2	Δ_3	Δ_4	Δ_5	Δ_6
1874, Dec. 28	+ .369	− .026	+ .634	− .087	+ .144	+ .093
1875, Jan. 7	− .066	+ .374	− .204	− .147	− .010	− .009
Jan. 17	− .257	+ .530	+ .609	− .196	− .136	+ .123
Jan. 27	+ .116	+ .122	− .049	− .005	+ .006	+ .005
Feb. 6	+ .003	+ .200	+ .455	+ .027	+ .026	− .032
Feb. 16	+ .036	+ .132	+ .490	+ .048	+ .063	− .086
Feb. 26	+ .302	− .169	+ .181	+ .040	+ .051	+ .038
Mar. 8	+ .434	− .336	− .300	− .070	− .049	− .061
Mar. 18	+ .406	− .343	− .255	− .017	+ .009	.000
Mar. 28	+ .511	− .483	− .404	− .112	− .087	− .096
April 7	+ .478	+ .485	+ .637	− .183	− .092	− .099
April 17	+ .467	+ .509	− .248	− .053	− .046	+ .041
April 27	+ .540	+ .617	− .294	− .126	+ .134	+ .121
May 7	+ .387	+ .499	− .286	− .023	+ .068	− .070
May 27	− .398	− .216	+ .009	+ .087	+ .223	− .228
June 6	− .355	− .138	− .126	+ .232	− .186	+ .176
June 16	− .342	− .090	+ .248	+ .327	− .162	+ .153
June 26	− .905	− .618	− .272	+ .162	+ .011	− .022
July 6	− .857	− .535	− .347	+ .126	− .103	+ .099
July 16	− .870	− .513	− .483	− .031	+ .137	− .146

953 NEGUS.

Date.	Δ_1	Δ_2	Δ_3	Δ_4	Δ_5	Δ_6
1874, Dec. 28	+ .283	− .080	+ .534	+ .198	− .169	− .224
1875, Jan. 7	− .002	+ .185	− .058	+ .019	+ .089	− .110
Jan. 17	− .393	+ .555	+ .614	− .061	− .030	+ .016
Jan. 27	+ .230	− .089	+ .143	+ .201	− .201	− .202
Feb. 6	− .083	+ .203	+ .394	+ .251	− .224	+ .217
Feb. 16	− .149	+ .249	+ .517	+ .202	− .145	+ .120
Feb. 26	+ .466	− .387	+ .396	− .100	− .094	− .108
Mar. 8	+ .298	− .240	− .213	+ .094	+ .105	+ .092
Mar. 18	+ .070	− .033	+ .031	+ .350	+ .363	+ .356
Mar. 28	+ .375	− .358	− .299	+ .091	+ .104	+ .094
April 7	+ .752	+ .756	+ .870	− .263	− .217	− .224
April 17	+ .331	+ .356	− .161	+ .100	+ .104	− .109
April 27	+ .654	+ .699	− .454	− .230	+ .234	+ .220
May 7	+ .501	+ .567	− .408	− .056	+ .079	− .081
May 27	+ .016	+ .124	+ .292	− .163	− .094	+ .089
June 6	+ .109	+ .238	+ .247	− .106	+ .129	− .140
June 16	− .028	+ .121	− .008	+ .098	− .013	+ .003
June 26	−1.041	− .871	− .612	− .031	+ .119	− .130
July 6	−1.143	− .952	− .811	− .179	+ .190	− .194
July 16	−1.256	−1.044	−1.021	− .417	− .331	+ .321

Examine these tables. We find that the values of Δ diminish, generally, from Δ_1 to Δ_6. In the case of 991 Negus and 953 Negus, they diminish very slowly beyond Δ_4.

Very little will therefore be gained by carrying the formula beyond four terms. In the case of 273 Bond, they diminish with more regularity For 991 Negus, the mean value of $\varDelta_6$ is 0.210; for 273 Bond, it is 0085; and for 953 Negus, 0.152. For 991 Negus, five values of $\varDelta_6$ are less than $0^s.1$; four values are greater than $0^s.1$ and less than $0^s.2$, while eleven values are greater than $0^s.2$. We must not expect good results in this case. For 273 Bond, fourteen values of $\varDelta_6$ are less than $0^s.1$, five values are greater than $0^s.1$ and less than $0^s.2$, and only one value exceeds $0^s.2$. We may expect better results here. For 953 Negus, six values of $\varDelta_6$ are less than $0^s.1$, seven values are greater than $0^s.1$ and less than $0^s.2$, and seven values are greater than $0^s.2$. The results will be little better than those of 991.

It must be borne in mind that this reasoning is based on the assumption that the coëfficients shall remain constant. If any of these vary, the method, as a means of *predicting* rates, becomes valueless.*

The computation of rates of these three chronometers, shown in the following tables, is carried far enough to show how much reliance can be placed on this method. It is unnecessary to recapitulate what has already been said on the subject (see pp. 15, 16). These tables, which are given without further comment, will show whether our conclusions have been just.

991 NEGUS.

$$r = +0^s.5874 \quad a = -.200519 \quad b = +.08381$$
$$c = -.013037 \quad d = +.013609 \quad e = -.03586$$
$$t = \text{May } 17,\ 1875;\ \theta = 69^\circ.3;\ \text{unit of time} = 10 \text{ days.}$$

Rate-day.	t'	θ'	Rate predicted.	Rate observed.	Diff.
		°	s.	s.	s.
July 31, 1875	July 26, 1875	80.2	−0.417	+0.160	0.577
Aug. 10, 1875	Aug. 5, 1875	77.5	−1.028	+0.257	1.285
Aug. 20, 1875	Aug. 15, 1875	80.3	−1.189	+0.240	1.429
Aug. 30, 1875	Aug. 25, 1875	74.3	−2.274	+0.283	2.557
Sept. 9, 1875	Sept. 4, 1875	78.6	−2.187	+0.328	2.515
Sept. 19, 1875	Sept. 14, 1875	72.4	−3.697	+0.370	4.067
Sept. 29, 1875	Sept. 24, 1875	63.6	−6.748	+0.212	6.960
Oct. 9, 1875	Oct. 4, 1875	67.9	This minus rate goes on steadily increasing until the temperature rises above 69°.3. Enough is given to show the dependence to be placed on the formula in this case.	+0.479	. .
Oct. 19, 1875	Oct. 14, 1875	62.9		+0.228	. .
Oct. 29, 1875	Oct. 24, 1875	64.3		+0.590	. .
Nov. 8, 1875	Nov. 3, 1875	59.1		−0.014	. .
Nov. 18, 1875	Nov. 13, 1875	60.2		+0.280	. .
Nov. 28, 1875	Nov. 23, 1875	58.4		−0.343	. .
Dec. 8, 1875	Dec. 3, 1875	53.9		−0.896	. .
Dec. 18, 1875	Dec. 13, 1875	54.4		−0.833	. .
Dec. 28, 1875	Dec. 23, 1875	56.0		−0.277	. .
Jan. 7, 1876	Jan. 2, 1876	59.8		+0.372	. .
Jan. 17, 1876	Jan. 12, 1876	54.2		−1.031	. .
Jan. 27, 1876	Jan. 22, 1876	57.3		−0.006	. .

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*In reality, while the values of the coëfficients of temperature may remain constant for some time, the values of the coëfficients of time vary arbitrarily. Consequently it is not safe to assume that the values determined from equations of condition extending over a period of 200 days shall remain constant much longer.

273 BOND.

$r = -0^{s}.53536 \quad a = -.043431 \quad b = -.03685$

$c = +.000935 \quad d = -.0084861 \quad e = +.0033871$

$t =$ May 17, 1875; $\theta = 69^{\circ}.3$; unit of time $=$ 10 days.

Rate-day.	t'	θ'	Rate predicted.	Rate observed.	Diff.
		°	s.	s.	s.
July 31, 1875	July 26, 1875	80.2	−1.750	−1.440	0.310
Aug. 10, 1875	Aug. 5, 1875	77.5	−1.602	−1.343	0.259
Aug. 20, 1875	Aug. 15, 1875	80.3	−1.798	−1.560	0.238
Aug. 30, 1875	Aug. 25, 1875	74.3	−1.397	−1.217	0.180
Sept. 9, 1875	Sept. 4, 1875	78.6	−1.979	−1.572	0.407
Sept. 19, 1875	Sept. 14, 1875	72.4	−1.238	−1.180	0.058
Sept. 29, 1875	Sept. 24, 1875	63.6	+0.040	−1.088	1.128
Oct. 9, 1875	Oct. 4, 1875	67.9	−0.593	−1.071	0.478
Oct. 19, 1875	Oct. 14, 1875	62.9	+0.264	−1.122	1.386
Oct. 29, 1875	Oct. 24, 1875	64.3	+0.078	−0.920	0.998
Nov. 8, 1875	Nov. 3, 1875	59.1	+1.112	−1.214	1.326
Nov. 18, 1875	Nov. 13, 1875	60.2	+0.993	−1.020	2.013
Nov. 28, 1875	Nov. 23, 1875	58.4	+0.343	−1.193	1.536
Dec. 8, 1875	Dec. 3, 1875	53.9	+2.562	−1.596	4.158
Dec. 18, 1875	Dec. 13, 1875	54.4	+2.644	−1.333	3.977
Dec. 28, 1875	Dec. 23, 1875	56.0	+2.745	−1.277	4.022
Jan. 7, 1876	Jan. 2, 1876	59.8	+1.608	−1.228	2.836
Jan. 17, 1876	Jan. 12, 1876	54.2	+3.150	−1.881	5.031
Jan. 27, 1876	Jan. 22, 1876	57.3	+2.492	−1.156	3.648

953 NEGUS.

$r = +1^{s}.78126 \quad a = -.04499 \quad b = -.028654$

$c = -.004025 \quad d = -.005723 \quad e = +.003695$

$t =$ May 17, 1875; $\theta = 69^{\circ}.3$; unit of time $=$ 10 days.

Rate-day.	t'	θ'	Rate predicted.	Rate observed.	Diff.
		°	s.	s.	s.
July 31, 1875	July 26, 1875	80.2	+0.568	+0.410	0.158
Aug. 10, 1875	Aug. 5, 1875	77.5	+0.794	+0.507	0.287
Aug. 20, 1875	Aug. 15, 1875	80.3	+0.398	+0.290	0.108
Aug. 30, 1875	Aug. 25, 1875	74.3	+1.036	+0.483	0.553
Sept. 9, 1875	Sept. 4, 1875	78.6	+0.484	+0.278	0.206
Sept. 19, 1875	Sept. 14, 1875	72.4	+1.241	+0.770	0.471
Sept. 29, 1875	Sept. 24, 1875	63.6	+2.032	+0.812	1.220
Oct. 9, 1875	Oct. 4, 1875	67.9	+1.662	+0.929	0.733
Oct. 19, 1875	Oct. 14, 1875	62.9	+2.172	+0.828	1.344
Oct. 29, 1875	Oct. 24, 1875	64.3	+2.085	+0.930	1.155
Nov. 8, 1875	Nov. 3, 1875	59.1	+2.626	+0.336	1.290
Nov. 18, 1875	Nov. 13, 1875	60.2	+2.602	+0.430	2.172
Nov. 28, 1875	Nov. 23, 1875	58.4	+2.259	+0.107	2.152
Dec. 8, 1875	Dec. 3, 1875	53.9	+3.345	+0.104	3.241
Dec. 18, 1875	Dec. 13, 1875	54.4	+3.422	−0.183	3.605
Dec. 28, 1875	Dec. 23, 1875	56.0	+3.386	−0.277	3.663
Jan. 7, 1876	Jan. 2, 1876	59.8	+3.065	+0.472	3.537
Jan. 17, 1876	Jan. 12, 1876	54.2	+3.813	−0.381	4.194
Jan. 27, 1876	Jan. 22, 1876	57.3	+3.582	+0.144	3.726

THE GENERAL EQUATION OF THE CHRONOMETER.

Taylor's theorem gives the general equation of the chronometer, which will satisfy any conditions of observation, provided a sufficient number of terms of the series be used. Beyond the limits of observation, the rates predicted by its means will only be reliable on the condition that the values of the coëfficients remain unchanged.

The general equation has been written by M. Yvon Villarceau,

$$(7)\ r' = r + a(t'-t) + b(\theta'-\theta) + c\frac{(\theta'-\theta)^2}{2} + d(\theta'-\theta)(t'-t) + e\frac{(t'-t)^2}{2} + \ldots .$$

By a further abbreviation of the coëfficients, it may be written,

$$(8)\ r' = r + a(t'-t) + b(\theta'-\theta) + c(\theta'-\theta)^2 + d(\theta'-\theta)(t'-t) + e(t'-t)^2 + \ldots$$

A sufficient number of terms of this equation will give approximately, within limits of observation, the rate of a chronometer.

Suppose we take only the terms of the first degree, and assume the temperature to be constant, or $\theta' = \theta$, or $\theta' - \theta = \theta = 0$, the equation becomes

$$r' = r + a(t'-t)$$

This gives the method usually employed for determining the rate r' at the time t' from the known rate r at the time t, where the variation of rate due to change of temperature is altogether neglected.

Including the term $c(\theta'-\theta)^2$, and assuming, as before, $\theta' = \theta$, the equation remains

$$r' = r + a(t'-t)$$

This is the equation of a line of isothermal rate for the time $(t'-t)$. It is the equation of a straight line; and if the value of a remains constant for all time, then all the lines of isothermal rates are parallel. The formula of Lieussou is founded on this supposition.

If, however, a varies slowly, the lines are not parallel, but are tangents to some curve whose equation is given by the law of change of a.

Including the sixth term of the series, and still assuming $\theta' = \theta$, the equation becomes

$$r' = r + a(t'-t) + e(t'-t)^2$$

which is the equation of a conic. The general equation of a conic is

$$ar^2 + br'(t'-t) + c(t'-t)^2 + dr' + e(t'-t) + r = 0$$

and, if the curve is a parabola,

$$b^2 - 4ac = 0$$

In this case, $b = 0$ and $a = 0$; therefore the curve is a parabola. In other words, if the six terms of the series will satisfy the conditions, and a varies slowly, the line of isothermal rate for any temperature is arc of a parabola, and the straight lines connecting points of equal temperature on the curve of rates are tangents to the *parabola* of isothermal rates for that temperature.

It is unnecessary to carry the discussion farther than the sixth term of the series.

Should it be necessary to introduce terms of the third degree to satisfy the conditions, the formula would become altogether too cumbersome for any practical purposes. Indeed, we have already seen that the formula of six terms is open to that objection. In practice, our object must be to simplify the equation as much as possible.

In discussing the general equation of the chronometer, we necessarily include all the formulæ that have been proposed. All include certain terms of the series. Thus the formula of Yvon Villarceau is

$$r' = r + a\,(t' - t) + b\,(\theta' - \theta) + c\,(\theta' - \theta)^2 + d\,(t' - t)\,(\theta' - \theta) + e\,(t' - t)^2$$

that of Lieussou,

$$r' = r + a\,(t' - t) + c\,(\theta' - \theta)^2$$

of MM. Cornulier and Mouchez,

$$r' = r + a\,(t' - t) + b\,(\theta' - \theta)$$

We have seen, in the practical adaptation of the formula of six terms to three chronometers, that it is wanting in one element necessary to adapt it to practice, viz, simplicity. The number of equations of condition must necessarily be great, the processes of elimination laborious, and the results uncertain. We have also been able to recognize the fact that but little is gained in accuracy by the introduction of the two last terms, while much is saved by rejecting them. Again, in the process employed by M. de Magnac, the value of θ is assumed, and must correspond to the time t in the equations of condition, whereas M. Lieussou makes θ an unknown quantity, setting it at the value for which the chronometer has its greatest gaining (or least losing) rate, and making the sign of the coëfficient of the term depending on change of temperature minus. This is a positive advantage, since it enables us to retain the values of c and θ, while recomputing those of r and a If we use the method of M. de Magnac, should it become necessary to redetermine the values of the coëfficients, the whole process must be gone over again with a new assumed value of θ.

We have spoken of the values of θ and c in Lieussou's formula as constant. They are not really so. They suffer a change, as will appear by the following table, in which the results of a recomputation of the coëfficients in the case of several chronometers are shown :

	r	a	c	θ
Chronometer 273 Bond :	s.	s.	s.	°
April 12, 1874	−1.025	+.0016	.0016	60.7
April 7, 1875	−0.229	−.0045	.0017	59.
April 11, 1876	−0.904	−.00106	.0027	64.9
Chronometer 1509 Barraud :				
Oct. 9, 1874	+1.678	−.0036	.0049	70.2
Oct. 14, 1875	+0.618	+.0034	.0064	68.3
Chronometer 775 Negus :				
April 12, 1874	+1.050	−.0002	.0048	72.8
April 7, 1875	+1.699	+.0083	.0068	70.9
April 11, 1876	+2.923	−.00202	.0023	65.1

This table indicates that the values of θ and c should not be depended on for more than a year. An increase in the value of c will show a gradual diminution of force in the compensation.

With regard to the term $b\,(\theta'-\theta)$, which is neglected in Lieussou's formula, it may be remarked that in the case of a well compensated chronometer little will be gained in accuracy by its introduction. If the chronometer were not compensated at all for change of temperature, its rate would vary directly with the first power of the difference of temperature; b would therefore be great and c insignificant. As the compensation approaches perfection, the importance of b diminishes. If we introduce b into the formula, and retain θ as an unknown quantity, our problem becomes complicated. We have five unknown quantities to determine, for it must be noticed that the value of c in the equation

$$r' = r + a\,(t'-t) + b\,(\theta'-\theta) + c\,(\theta'-\theta)^2$$

will not be the same as in Lieussou's formula. The value of θ will also be different, and if of θ, then also of r and a. It will not do to simply introduce the term $b\,(\theta'-\theta)$ into Lieussou's formula with the values of the coëfficients already determined. If we assume a value of θ with a corresponding value of t, the method is open to the same objection as that of M. de Magnac, viz, that the values of the coëfficients are only good for the time being.

We are led to conclude that, for practical purposes, with good chronometers, the method of M. Lieussou is the best. For predicting rates, we may retain the last determined values of θ and c, and form two new equations of condition, from the latest observations, to redetermine r and a. In the following example the interval between the equations is 30 days. The observed rates are each the mean of 10 days. The *date* of the formula is retained at that corresponding to the values of θ and c. The rates are predicted for 60 days, which is as far as would generally be necessary in navigation. In comparing the observed with the predicted rates, it must be borne in mind that the probable error in an observed rate is $\pm\,0^{s}.06$.

Example.

CHRONOMETER 273 BOND.

April 12, 1874: $c = 0.0016$; $\theta = 60^{\circ}.7$.

OBSERVATIONS.

Mean date.	r'	θ'	$(t'-t)$
	s.	°	
Jan. 27, 1875	−0.588	54.3	290
Feb. 26, 1875	−0.402	58.2	320

Equations of condition.

$$-0.588 = r + 290\,a - .065536$$
$$-0.402 = r + 320\,a - .01$$

Solving,

$$r = -1^{s}.834$$
$$a = +\ .0045$$

The equation of the chronometer may now be written

$$r' = -1^{s}.834 + .0045\,(t' - \text{April } 12,\ 1874) - .0016\,(60^{\circ}.7 - \theta')^2$$

Rate-day.	Mean date.	θ	Rate predicted.	Rate observed.	Diff.
		°	s.	s.	
Mar. 13, 1875	Mar. 8, 1875	59.	−0.350	−0.270	.080
Mar. 23, 1875	Mar. 18, 1875	59.9	−0.301	−0.298	.003
April 2, 1875	Mar. 28, 1875	61.6	—0.260	−0.193	.067
April 12, 1875	April 7, 1875	67.0	−0.277	−0.266	.011
April 22, 1875	April 17, 1875	61.8	−0.171	−0.237	.066
May 2, 1875	April 27, 1875	62.3	−0.128	−0.164	.036

Accumulated error in chronometer correction, using predicted rates . . $=0^{s}.59$
Accumulated error in chronometer correction, neglecting predicted rates $= 9^{s}.81$

In using Lieussou's formula, it is not necessary that the equations of condition should be separated by equal intervals of time. The intervals should be as nearly equal as circumstances of observation will permit, and the equations should all have the same weight. The equations may be solved by the ordinary algebraical processes. The term $c\vartheta^2$ in the expanded equations will disappear in the first subtraction for the elimination of r.

Finally, the values of θ and c might readily be furnished with each chronometer on its issue from the Naval Observatory,* which would leave only r and a to be determined. The *date* of the equation, or value of t, would of course be given, and new values of θ and c might be established by the navigator, or person having charge of the chronometer, as soon as a sufficient number of observations with sufficient variation of temperature could be had.

CONSTRUCTION AND USE OF THE CURVES—GRAPHIC METHOD OF PREDICTING RATES.

If the curves of chronometer rates, and corresponding curves of temperature, are kept on a sheet of paper of convenient size, they present graphically the changes of rate due to changes of temperature. Paper ruled in squares of a fraction of an inch is convenient for the purpose. An eighth of an inch may represent two days on the scale of dates, one degree Fahrenheit on the scale of temperatures, and one-tenth of a second on the scale of seconds of time.

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*It would not be possible to furnish from the Observatory reliable values of r and a. They would change in transporting the chronometer to its destination.

The observed mean temperatures should be plotted for every 24 hours, in order to have as many points on the curve of temperatures as possible The curve is then completed by connecting these points by straight lines. If a self-registering thermometer is not to be had, the temperatures should be observed at 9 o'clock a. m., that being the hour at which the ordinary thermometer indicates about the mean temperature of the day. In any case, the temperatures should be observed every day at the same hour.

The points on the curve of rates for the standard chronometer should be plotted from observations. It must be remembered that the oftener observations are had the more points will be got on the curve, and consequently the more accurate will be its form. The rates used in plotting these points should all be deduced from observations of the same kind (the method of equal altitudes, when the sextant is used, being, of course, preferable to any other). The observations and comparisons should always be made by the same person, and no rate should be determined from observations made at different places.

Having a sufficient number of observed rates, plot the corresponding points on the curve of the standard chronometer. The temperatures being plotted every day, the rates should be plotted on their corresponding mean date. For example, if observations are had on January 10 and 20 from which a certain rate is deduced, that rate will correspond to the mean date January 15, and should be plotted on that day.

Complete the form of the curve of rates of the standard chronometer, between the determined points, by analogy, drawing it first in lead-pencil, in order to allow for correction of form.

For the curves of the other chronometers, the points should be plotted *daily* from comparisons made with the standard chronometer, always, of course, at the same hour. These points can be laid off by direct measurement from the curve of the standard chronometer by using the *second differences* of daily comparisons, and will show accidental causes of variation to which all three chronometers are equally exposed, and thus give a means of correcting the form of the standard curve. For example, if a deviation is observed between determined points common to both curves plotted by daily comparison, it is fair to infer that such deviation should appear on the standard curve, and its form may be corrected accordingly.

The three curves being drawn in lead-pencil, and their figures corrected, they may be gone over in ink.

Draw as many lines of isothermal rates as possible, using only for this purpose points of equal temperature on the curve of rates whose position has been determined by observation, and connecting each point so determined with the *next* one to it of corresponding temperature. An error may here arise from using the observed mean temperature for 24 hours, instead of the mean temperature for the number of days determining the rate. Where these two differ greatly, the point should be avoided in drawing lines of isothermal rates. The more lines we can get the better, though three or four will serve to determine the mean direction of the lines. If we follow the above precautions, the mean direction of the lines of isothermal rates will be correctly indicated on our sheet for the time over which the observations extend.

To predict the rate for any day, find on the curve of rates already established the last point corresponding to the same temperature as that observed on the day for which the rate is required. From this point draw a straight line parallel to the mean direction of the lines of isothermal rates. The ordinate of the point at which this line cuts the line of the given date is the rate required, approximately

If a sufficient number of lines of isothermal rates has been plotted, we may be able to determine the direction of the curves to which these lines are tangents. These curves will be found generally to take the form of parabolas, whose arc of curvature will be abrupt or gradual according as we are near to or remote from the origin. If the direction of the curve at the specified temperature can be determined, we may prolong this direction as nearly as possible, instead of using the mean direction of the lines of isothermal rates.

This method of predicting rates is rough at the best. The curves of rates plotted from observations will generally show whether it may be used to advantage. In any case, it is well to keep the curves of chronometers. They show graphically the variations of rate, and are much more easily studied and comprehended than a mass of figures.

In the plate, the curves of four chronometers are laid down for the year 1875, with the corresponding curve of daily temperatures. The points on the rate-curves are determined for every tenth day, and each curve is constructed independently. Beyond October 24, the curve of predicted rates is laid down in dotted lines, the points being determined for every second day. In the following table, the results of comparing the accumulated error by the predicted rates with the actual observed error in the same time, and with the error obtained by carrying forward the rate of October 24, are given; the chronometer error on October 24 being assumed, for convenience, as 0.

	3276 Frodsham.	1232 Negus.	1231 Negus.	413 Eggert.
	s.	s.	s.	s.
Accumulated error, using predicted rates.	+146.34	+36.44	−62.16	−234.56
Accumulated error, by observation . .	+129.89	−15.74	−76.26	−214.56
Accumulated error, by rate of October 24.	+136.15	+49.00	−46.00	−211.00
in fifty days.				

By comparing the results with the constructed curves, it will be seen that where the deflection in the curve of observed rates is slight beyond October 24, there is no advantage gained in using the predicted rates; but where the deflection is great, there is a positive advantage. Again, where the deflection is slight beyond October 24, there is a corresponding slight deflection in the curve at points of corresponding temperature in the first part of the year; but where there is a great deflection beyond October 24, there is a corresponding great deflection in the first part of the year. We may justly conclude that, when the curve of rates shows great variation due to change of temperature, we may gain by the use of predicted rates. When the rate of the chronometer varies little with change of temperature, this method is of no great practical value.

At sea, where the corrections of the three chronometers are frequently compared, it may be found advisable to use predicted rates for one or two chronometers, while neglecting them for others; and if the curves have been drawn from observations made in port we may generally know by inspection whether it is advisable to adopt predicted rates or not.

If the sheets are regularly kept up, it is well to note on the margin, under the scale of dates, the time passed at sea and in port, and also such events as are likely to affect the rates of chronometers, such as exercises at the battery with powder, salutes, sudden squalls, heavy rolling or lurching of the ship, etc., etc.

In using the formulæ, the same precautions with regard to observations for rates and temperature should be followed. Bad observations or observations carelessly taken are worse than useless. When the sextant is used, rates should only be adopted that have been determined by observations of equal altitudes. A constant personal error of the observer in setting the sextant is eliminated in equal altitudes. In computing the probable error of an observation, it may be noted that an error of comparison may be as great as $0^s.45$; errors of altitude and counting time during the observation may be as great as $0^s.6$ Besides these, the variation of the comparing-watch between comparisons must be taken into account. The probable error is the square root of the sum of the squares of the possible errors. A rate is determined from two observations, and its probable error is the probable error of one observation multiplied by the square root of 2 and divided by the number of days between the observations.

It is not intended in this paper to insist on the use of the formulæ with all chronometers afloat. The chronometers of the Navy are reliable instruments, and in the ordinary routine of navigation it is perfectly safe to neglect variation of rate due to change of temperature, especially when the change is slight. A ship of war carries three chronometers, which serve as a check on each other. Their rates are determined, from time to time, during the vessel's stay in port; and this plan is sufficient for ordinary cruising.

The formula of Lieussou may, however, serve in many cases where great precision in chronometer-observations is desirable. It is simple, and within certain limits reliable, and it may be interesting to navigating-officers, and others having charge of chronometers, to adopt the formula to their instruments, and compare the results obtained with observations. In most cases, if the chronometer curves are carefully constructed, a simple inspection of them will indicate whether good results may be expected from using the formula.

It is not intended to lay stress on any method of predicting rates. The result of the application of the formula to a number of chronometers at the Observatory seems to indicate that when the rate is decidedly affected by change of temperature, but not so much as to make the value of the coëfficient of temperature too large (see p. 7), there will be a gain in using predicted rates. If the chronometer is little affected by change of temperature, there is, of course, little need of predicted rates. When the chronometer is very much affected by change of temperature, it becomes an unreliable instrument, the values of the coëfficients are uncertain, and the results given by the formula unreliable.

It is probable that chronometers, as a rule, perform better on board ship than at the Observatory. In the Observatory, they are exposed in a room whose temperature varies almost directly with that of the outside air, while on board ship they are excluded from sudden changes of temperature, being kept in a double case, and generally below the water-line.

Those who apply the formula must, of course, judge of the results to be expected in their special cases by study of the curves or frequent comparison between rates given by the formula and by observation.

Note.—Since the foregoing pages were printed, there has appeared in *Nature* (March 8, 1877) the review of a lecture on navigation, delivered under the auspices of the Glasgow Science Lectures Association, by Sir William Thompson, in which reference is made to the " discovery, by Mr. Hartnup, of a system of rating chronometers, which gives an almost perfect means of compensating for change of rate due to change of temperature."

In this paper, Mr. Hartnup's method has been passed over in a few words. The accounts of his work have appeared from time to time in the *Monthly Notices of the Royal Astronomical Society* and in the *Reports of the Astronomer to the Mersey Docks and Harbor Board*, and have not escaped the writer's attention. Mr. Hartnup's method is the formula of M. Lieussou, and the results of adapting that formula to many chronometers at the Naval Observatory have been fairly stated, and do not seem to warrant all that is claimed for the method by Mr. Hartnup.

CHRONOMETER AND TEMPERATURE CURVES.